



# Ultra-Modern Network Infrastructure for Swiss Federal Railways

Punctual, precise, reliable ...

The quality of Swiss Federal Railways (SBB) is legendary. Four operations control centers are now helping to further increase the railroad's performance. The example of the central operations control center in Olten shows just how high the demands being made on the network are.

For thousands of years now, Olten has been an important intersection when it comes to transport over the Alps and traffic along the northern side of the Swiss mountains. It became even more significant with the advent of the railway. Olten has a pivotal role for SBB as the railway hub between Basel, Bern, Zurich and the major alpine tunnels.

This is why Olten was an obvious choice for one of the four new operations control centers that are due to make Swiss rail traffic even more efficient over the next 100 years. SBB will be centering all tasks of daily rail operation in the four

new operations control centers by 2016: scheduling, operation, control, monitoring and customer information. They will take the place of more than 100 remote control centers and stations.

### Sustainability thanks to the 25-year system warranty

Building a new operations control center, which is to play such a significant role in railroad traffic, requires farsighted planning and specific system solutions. "The operations control center in Olten is designed for a useful life of 80 years," explains project manager Jürg Lauber. Some of the technology inside the build-

From left to right: Peter Meier, R&M Switzerland; Jürg Lauber, project lead at the SBB infrastructure telecom division; Hanspeter Digel, project lead at the SBB infrastructure telecom division; Franco Suppa, divisional manager for installations at swisspro AG; Beat Stucki, R&M Switzerland.



ing will be replaced after five years, but most of it will last for a period of 20 years. "For cabling, we assume a half life of 20 years," says Hanspeter Digel, project manager for information and communication technology.

The 25-year system warranty from R&M exceeds these specifications. The supplier of copper and FO infrastructure was chosen on the basis of compatibility to installations at other sites. Hanspeter Digel: "This guarantees lasting and economic availability of all cabling components." The R&M solution also simplified the storage of spare parts.

### Maintenance-friendly

A further criterion in the evaluation was that the network should be maintenance-friendly. As the railway system has to work around the clock without interruption, all sources of error have to be excluded when the cables are being serviced or changed. All elements should be able to be handled intuitively, transparently and without any great need for tools.

"In the future, we are going to have to carry out more maintenance work during the day and during the week – in other words when everything is in full



### R&M SYSTEM SOLUTION FOR THE OLTEN OPERATIONS CONTROL CENTER

The SBB operations control centers are highly complex facilities for the interregional control of Swiss rail traffic. The cabling for controlling the signals and switches as well as IT and communication technology are correspondingly sophisticated. The high level of operational reliability plays an important role. The requirements for protecting the railway system are as high as for data centers. The infrastructure of the



Olten operations control center with computer rooms, 180 server cabinets, distributors and connecting lines features a redundant design. Backbone and access layer of the data network are based on FO cabling. Copper cabling connects the computer rooms with the frontend devices in the control room. Telecommunication is integrated in the Ethernet/IP network.



### The installation included the following:

- Provision of workplace infrastructure: 4000 links with 250 km Cat. 7 cable and 8000 Cat. 6<sub>A</sub> modules
- Backbone: 600 VARIOline FO cables with 12 or 24 fibers, pre-terminated on one or both sides
- Distributors: VS83 bays for 19" with swivel frame
- 1000 copper and 500 FO patch cords

swing," says Jürg Lauber. In that sense, the quality, quick mounting technology and modularity of the R&M systems are of particular help. This is something that is also confirmed by Franco Suppa from swisspro AG, the company responsible for the installation.

### SBB Operations Center Olten

People in Switzerland take the train more often than any other nationality in the world. SBB regulates the switches and signals for around 10 000 trains every day in its national network. These transport around one million people and approx. 200 000 tons of freight every year. Half a billion switching operations are necessary in the signal boxes every day to ensure that the trains reach their destinations safely. For just one train journey from Zurich to Bern, you need more than 200 000 functioning switching operations.

The new central operations control center in Olten started operation in November 2014 after a two-year construction period. SBB invested around CHF 100 million in this project. The new building is part of a long-term plan that was initiated in 2006 to optimize rail traffic in Switzerland to ensure that future traffic needs can be met professionally.

Olten is responsible for the railway system between Basel, Bern and Lucerne as well as the two alpine transversals, the Gotthard and Lötschberg tunnels. It operates more than 3000 switches and 2900 signals. The heart of the operations control center is the control room where there are as many as 100 workstations.

### Customized design

Custom-made devices for the control room on the top floor of the operations control center were also on SBB's wish list. As many as 100 employees regulate rail traffic through central Switzerland. On their desks, all you will see are input devices and monitors. The systems – just like the servers, switches and other active devices – are on separate floors to avoid noise and waste heat at people's desks.

To make this possible, the tables had to be equipped with compact boxes that unite several connections. Within an extremely short time, R&M developed a suitable unit using the Cat. 6<sub>A</sub> module. "Working out this specific solution together was of immense benefit to us," underlines Hanspeter Digel. He describes collaboration with R&M as being both exemplary and innovative. ■



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