

LEONI *projectreport*

All-in-one solutions



Linth-Limmern pumped storage power plant

At the customer's service with an all-in-one solution

The Kraftwerke Linth-Limmern AG power generation company produces valuable peak energy that makes a decisive contribution to the balancing out of power consumption and production in Switzerland. To ensure the same stays true in the future, an additional pumped storage plant has been built, with LEONI as a key project partner. As a full-service provider, the company was responsible for planning, delivery, installation and testing of the complete medium voltage system. In addition, a new, extremely resilient cable was developed to provide further efficiency potentials for the customer.

Medium voltage connections – made to measure

The new subterranean pumped storage plant is designed to pump water between the Limmernsee and Mutsee reservoirs, where the height difference of 630 metres can be used to produce electricity. With a pump and turbine output of over 1 gigawatt, this generating station is one of the most significant projects in the alpine region.

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LEONI developed a custom medium-voltage cable specifically for this project: the "BETApower® XDMZ-Z Heavy". This cable is used in installations where cables are subjected to powerful tensile forces and extreme stresses. The project requirements were challenging. First, the cable had to connect the machine cavern to the valve chamber located higher up – this required a cable 1200 m long and the negotiation of an elevation drop of 80 %. A further difficulty was, that the cable's protective pipe was enclosed solely in bare rock. This meant that the cable could only be delivered in one single piece and fixed only at the point where the pipe exited in the valve chamber – a real challenge for materials and installation personnel alike. This resulted in major cost savings for our customer, however, who was able to avoid using multiple cable ducts and the time-consuming installation of clamps and sleeves.

An all-in-one logistics solution: taking the funicular to the top

The cable itself weighs over nine tonnes. Conventional types of cable would simply rupture under their own weight, but LEONI developed this custom cable and its suspension mechanism together with the customer specifically for this project. Moving the cable to the valve chamber at an elevation of 2300 m was an extreme logistical challenge, however, with the cable being so heavy and the entire construction site located in a mountain range. Road access was available only to the installation site: from here, all of the machinery, construction materials and personnel had to be transported all the way up the mountain by funicular. The complex logistics and cable pull were a major challenge for the entire project team.

Thoroughly preparation, key expertise in logistics and cable installation plus innovative technology – the "Linthal" project benefited from LEONI's broad portfolio of products and services. The pumped storage plant went online in 2015. After completion of the commissioning work, the pumped storage power plant will be operational with all four machine groups by the end of 2017.

Plant data

Output/production	1520 MW/460 GWh per year
Elevation	2500 m a.s.l.
Duration	6 years
Catchment area	140 km ²
Capital investment	CHF 2 billion



High-precision transportation of cable reel and laying machine, deep in the mountain.



A perfect cable pull.

Products and services from LEONI Business Unit Building Technologies

- Project design and planning
- Implementation consulting
- Project management
- Logistics models
- Medium voltage cables
- Medium voltage equipment
- Installation and installation services
- Installation plan
- Measurement and testing of cable joints

Customer benefits

- Major cost savings for the client, thanks to the development and deployment of a new heavy-duty cable
- Broad expertise in logistics and operational planning
- Environmentally friendly implementation