

WORLD RECORD

Installation of 13 km of fiber optic cable in a single length through water floating technique.

Nexans Switzerland, in cooperation with Plumettaz Ltd, installed in the Bergell valley a fiber optic cable in the Löbbia - Castasegna gallery for the sake of the Electrical Utility of Zurich city (ewz, Elektrizitätswerke der Stadt Zürich).

Project. Nexans Switzerland provided the engineering for the laying technique, the dimensioning of the tubes, as well as the design and manufacture of the optimized cable. Our partner Plumettaz, a world leader in blowing and water carrying techniques, has provided the main material for water jetting and the feasibility calculation. The Bergeller Kraftwerke staff took care of the installation of the PE pipe in the gallery under the supervision of Nexans Switzerland. The nearly 13 km length in one single cable piece is a world record for the water jetting installation technique according to our partner Plumettaz.

Historical context. The development of the water-carrying technique dates back to the early 2000s, and it is no coincidence that it was developed by the Plumettaz company, whose experience was recognized worldwide for the equipment blowing optical fibre cables.

Water jetting technique has dramatically improved the performance of the blowing technique by changing the fluid, using water instead of air. This innovation has the following advantages:

- Reducing the effective weight of the cables thus installed thanks to Archimedes thrust
- Reduction of the friction thanks to this relief
- Possibility to combine this water supported pushing (water jetting) with a traction effect thanks to the installation of pressure relief devices to exert a controlled traction at the end of the cable (sonic head), to enhance passing bends in the trajectory
- Strong increase in installed length when the density of the pushed cable is close to that of water, which is the case for synthetic cables (optical cables) or power cables with aluminium conductors

That is why Nexans Switzerland introduced this technology for the first time in a medium voltage cabling project in the Areuse gorges (Neuchâtel, Switzerland) where the 36 curves in the duct route made it impossible to use traditional traction techniques based upon winches with metal or synthetic rope. This 2.7 km project has allowed to install 3 single-core medium voltage cables and one fibre optic cable in 4 previously installed HDPE ducts. This project was followed by around thirty others, mainly in the water supply galleries of the main hydroelectric plants in Switzerland. In total, more than a hundred kilometers of power cables (LV & MV), 65 km of optical cables and nearly 90 km of hybrid cables of all kinds (optical fibers + LV + copper signalling conductors) have been installed.

World record. It has been achieved through the combined effects of:

- Plumettaz simulation software that allowed to verify the feasibility of the project and to establish the minimum requirements in terms of layout (dimensions and method of installation of the HDPE tube)
- Water jetting equipment optimized with the latest technical innovations (sonic head of Plumettaz)
- Optimized cable construction for high pressure water jetting technique
- Optimized installation material (Nexans Switzerland)
- Very experienced installation team in this very special field (Nexans Switzerland)

Nexans Switzerland is proud and happy to make this experience available to its loyal customers and especially thanks companies that trust us.

For further information do not hesitate to contact us.

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