



## Renewal Ritom Hydroelectric Power Station (CH) Polymer Stabilized Cement Grouting

<b>Country</b>	Switzerland
<b>Type</b>	Hydroelectrical Power Station
<b>Client</b>	Ritom SA, c/o FFS SA
<b>Main Contractor</b>	Consortium Marti-Ferrari Ritom
<b>Execution of the work</b>	Renesco GmbH/ Renesco AG
<b>Designer</b>	Consortium Ritom Ticino (CRT), c/o IM Maggia Engineering SA
<b>Site Supervisor</b>	Consorzio Ingegneri CORI, c/o Renzo Tarchini Canttieri & Contratti SA
<b>Construction Period</b>	2019 – 2020

## Project Description

Ritom SA, a joint venture between Swiss Federal Railways (SBB) and the canton of Ticino, intends to build a new hydroelectric plant to replace its existing one in the canton of Tessin. The project includes the construction of a pressure tunnel, a new power station and an equalizing reservoir with a capacity of 100,000m<sup>3</sup>. The renewal of the power plant, which was built in 1920, will last until spring 2022.

The new pressure tunnel consists of three sections. The upper section with a length of 150m and the lower section with a length of around 650m are constructed by drill and blast. The middle section, about 1,500m long, are excavated as an inclined tunnel with a completely redesigned gripper TBM with a diameter of 3.23m.

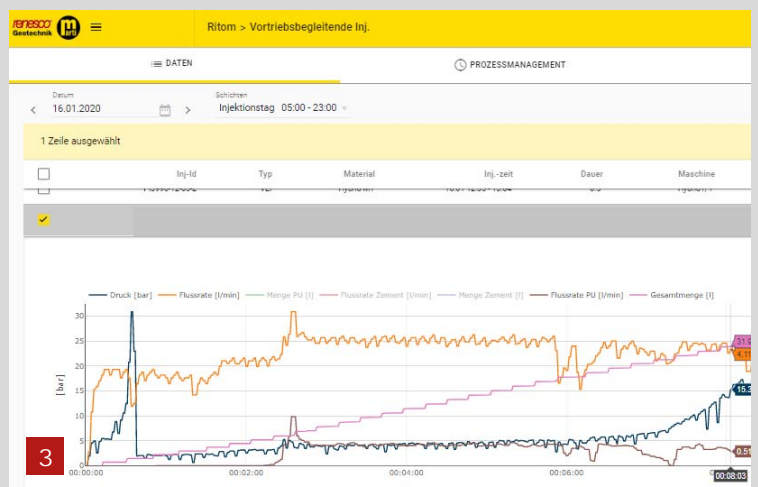
Innovative and computerized application of polymer stabilized cement grouting is supporting the excavation process in a water-enriched environment of the pressure gallery. Such a hybrid - injected cement in combination with polyurethane resin & accelerators - will give early strengthening, stabilizing and sealing of the ground - even with the presence of flowing water. Automation of the injection process will allow for a controlled application - a variable addition of resin during the injection in particular and consequently a controlled fast in-situ reaction time depending on hydrogeological conditions. Extreme water-enriched fissures can be injected with hybrid grout before fine fissures will be closed by cement grout in only one injection process - finally, a flexible grout mixture during the whole injection process.

## Geology

- Paragneisses
- Orthogneisses

## Scope of Service

- Computerized/ automated application of polymer stabilized cement grouting



1. Renesco at Work
2. Drilling Operation
3. Pressure/Quantity Diagram