

Mauvoisin Hydropower Scheme Switzerland



Project Description

Since commissioning of the power stations Mauvoisin in 1956, relatively large sedimentation occurred in the Mauvoisin reservoir, consisting of deposits of fine sediments, the “Gletscherschliff” (approx. 330,000 m³/yr). The sediment deposits have reached the intakes of the power and bottom outlet tunnels. If the water level is lowered under a critical level, this can lead to a large entry of suspended sediment load into the waterways and cause abrasion of the turbines as well as blockages of valves, etc.

In a planning study various options were examined for the prevention or reduction of the sediment entry, with the result that new intake structures

shall be provided for both the tunnels: For the power intake around 38 m and for the bottom outlet around 36 m higher than the existing ones. The new intake structures must via new tunnel sections be connected to the existing tunnels. In addition new safety valves (butterfly valves and high pressure sliding gates) are being installed, in new underground chambers and adits.

Client

Forces Motrices de Mauvoisin S.A.,
Sion, Switzerland

Project

Modification of power tunnel and bottom outlet structures

Service Provider

Pöyry Energy Ltd. in joint venture with another Swiss consulting engineering company

Services

Owner's engineer for renewal of intakes for power tunnel and bottom outlet

- Feasibility study
- Final design, specifications and tender documents
- Tender evaluation
- Detailed design and civil works construction drawings
- Review of suppliers' designs for electro-mechanical equipment
- Supervision of construction, factory tests, installation and commissioning of equipment

Execution Period

1998 – 2006

Pöyry Energy Ltd.

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Mauvoisin Hydropower Scheme

Key Data

Dam

Type double curvature arch dam
Height above foundation 250 m
Crest length 520 m

Reservoir

Full supply level 1,975.00 m a.s.l.
Min. operating level 1,838.00 m a.s.l.
Storage volume 210 million m³
Useful storage 193 million m³
Area at full supply level 2.26 km²

Bottom outlet

Original structure

Intake level 1,792 m a.s.l.
Diversion tunnel length 1,145 m
Capacity 140 m³/s

New structure

Intake level 1,828 m a.s.l.
Diversion tunnel length 981 m
Diversion tunnel diameter 3.70 m

Type of gates 2 sliding gates
Size of gates (w x h) 1.6 x 2.2 m
Capacity 100 m³/s

Power intake and pressure tunnel

Original structure

Intake level 1,794 m a.s.l.
Pressure tunnel, total length 4,455 m

New structure

Intake level 1,828 m a.s.l.
Pressure tunnel new section:

- length 375 m
- diameter 3.06 m

Type of valves 2 butterfly valves
Size of valves 2.7 m
Discharge 34.5 m³/s



Mauvoisin reservoir: Empty reservoir with sedimentation



Workshop inspection of new steel liner



Intake structure, hydraulic model