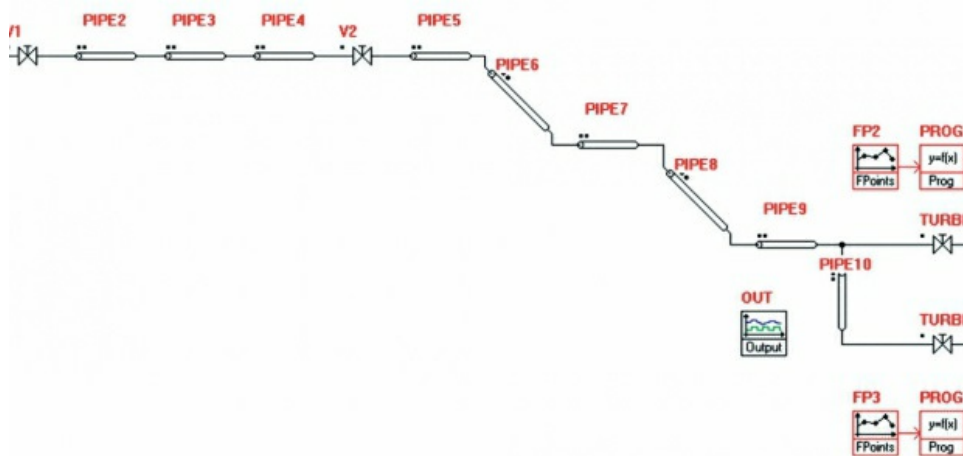


# TRANSIENT PHENOMENA MODELLING / SIMULATION

To ensure the safety of hydroelectric facilities, HYDRO Exploitation has developed a proactive, systematic method of identifying, assessing and managing operational risks.



Modelling and simulation of hydraulic and electrical components as well as the turbine governor of hydroelectric facilities are done with SIMSEN software. In this context, the following issues can be analysed :

Within this framework, the following issues can be analysed:

- simulation of water hammer
- capacity curve to primary control
- optimisation of operating water levels
- simulation of « electrical braking »
- simulation of brushless excitation systems
- simulation of two-phase short-circuit
- optimisation of turbine inlet valve, injector or wicket
- gate opening and closing times

## Methodology

- hydraulic/electrical modelling of a facility
- model validation through measurements
- identification of critical scenarios
- simulations and results analysis
- risk evaluations
- corrective measures recommendations

## ADDITIONAL SERVICES

### Vibration diagnosis

Hydro Exploitation provides a complete service for vibration diagnostic solutions (measurements and analysis) on all types of hydroelectric machines.

## CONTACT

HYDRO EXPLOITATION SA

Rue de l'Industrie 10, 1951 Sion

+41 (0)27 328 44 11

### Specific skills

HYDRO Exploitation's specialists :

- provide a complete methodology, modelling and analysis service
- have the know-how specifically required to resolve these types of problems, with respect to their analysis and evaluation
- have considerable experience in the management of hydroelectric facilities: they therefore have a highly practical global view of each situation

### Client benefits

The owner of the hydroelectric facility has the benefit of :

- a complete service delivered by Switzerland's very few experienced specialists
- relevant information about the safety of a facility