WP 6

Effects of load fluctuation on tunnels and associated hydraulic structures

Transients may destabilize the tunnel roadway and scour deposits from sand traps, resulting in sand transport and turbine damage, and also destabilize entrapped air pockets resulting in blow outs. Pore pressure variations may destabilize the rock mass and trigger rock falls.

Hydropower intakes and tunnels are poorly instrumented and monitored, and hence reliable data on loss of water, friction losses, air and sediment problems are virtually non-existent. In order to study the hydraulics of tunnel systems it is also necessary to develop reliable monitoring methods.

This project will address the following topics:

- Develop scenarios for hydraulic fluctuations at selected sites (Closely linked to WP5)
- Develop experimental reaches for field monitoring and testing
- Analyze the effects of fluctuating loads tunnels and structures
- Develop tools for predicting short and long term effects
- Develop guidelines and propose mitigation measures