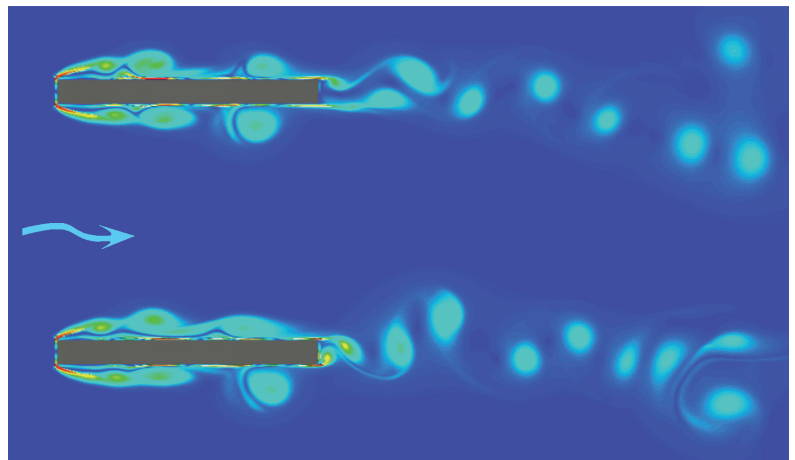
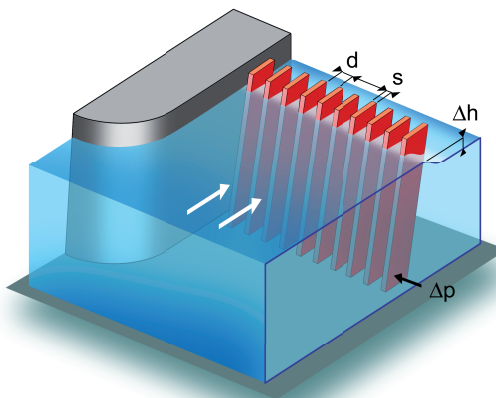


PhD - Investigation of trashrack losses (2002)

Trashracks, consisting of an array of bars are typical inlet devices of river power plants which prevent floating wood and large sediment grains etc. from hitting the turbine runner. Trashracks, however, produce energy losses which increase drastically as the distance d between the bars (bar thickness s) becomes smaller. This results in a water level difference and a pressure gradient.



DNS simulation of trashrack flow. At bar distances d of 5 to 10 cm or more each bar acts as a single object in the flow.

Practical experience during operation over the past decades has shown relevant discrepancies between measured and theoretically determined energy losses at intake trashracks of low head river power plants. On one hand not all loss-relevant parameters are taken into account by the usually applied equations and on the other hand, thorough comparison of field measurement data is prevented by rapidly changing flow conditions and widely varying geometrical parameters which all may have an influence on the quality of the obtained results. This research contribution tries to point out how this gap can be bridged and better prognosis of trashrack losses can be reached by applying a new equation in combination with numerical analysis of the flow field in the upstream vicinity of such Trashracks.

Keywords:	Energy losses, River power plants
Commissioned by:	PSEL (Fund for Projects and Studies of the Swiss Electric Utilities)
Project status:	Completed 2002

