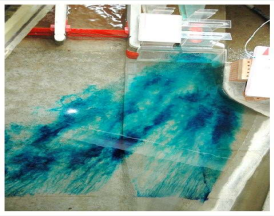
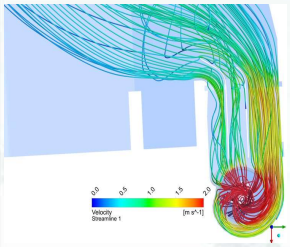

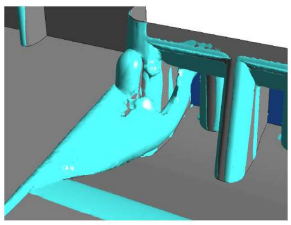

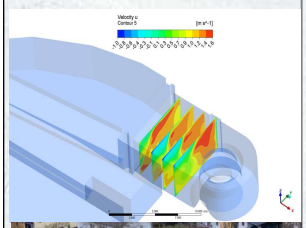

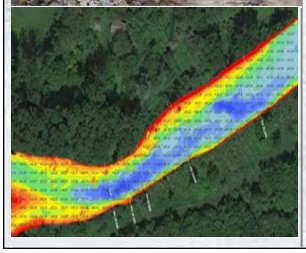

Master Project

Approach Flow Analysis by CFD

MOTIVATION: The geometry of a penstock is essential for ensuring the smooth and efficient conveyance of water to hydraulic turbines, and subsequently affecting turbine efficiency and energy conversion. A well-designed geometry can help to decrease energy losses, confine turbulence, and achieve optimal hydraulic operation. In this master project Computational Fluid Dynamics (CFD) is used to investigate and refine the geometry of penstock to improve the hydraulic turbine operation. It can boost hydraulic efficiency, reduce flow disturbances, and enhance the overall performance of the turbine. This research seeks to create practical and effective solutions for the improvement of hydropower systems by integrating curve-based design optimization as well as sophisticated computational tools.

Delivery: This scientific report will deliver optimized penstock geometries, validated through CFD, to enhance efficiency, reduce flow disturbances, and improve turbine performance.

Start: Immediate

Contact: +43 316 873 - 8351
Email: misagh.moradali@tugraz.at

Institute of Hydraulic Engineering and Water Resources Management