

IST – EPFL Joint doctoral Initiative

Thesis Topic Proposal Form

TITLE: Dynamic behaviour of pumps as turbines: experimental and numerical modelling**FOCUS AREA:** Environmental Hydraulics**Short Description**

This research aims at the experimental and numerical characterization of the behaviour of pumps as turbines (PAT) operating under non-ideal steady state conditions and under transient conditions. For this purpose, the experimental pipe rig assembled at IST will be used and adapted to fulfil research goals. The proposed methodology is:

- Adaption of the existing experimental facility for the new test conditions.
- Data collection under steady and unsteady state conditions.
- Analysis of the influence on PAT efficiency of the inlet/outlet conditions.
- Numerical modelling of the PAT for transient conditions (using experimental Suter parameters).
- Model calibration and validation.
- Synthesis of lessons learnt concerning parameters affecting the PAT efficiency and the description of PAT behaviour under transient conditions.

Keywords: pumps as turbines, efficiency, transient, modelling**SUPERVISORS**IST: Professor Dídia Covas
didia.covas@tecnico.ulisboa.ptEPFL: François Avellan
Francois.Avellan@epfl.ch

Doctoral Program in Civil Engineering

Doctoral Program in Energy

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