



DRAKOS · POLEMIS
PUMPS MANUFACTURERS S.A.



PROJECT PARTNER

National Technical University of Athens

Department of Mechanical Engineering

Laboratory of Hydraulic Turbomachines (LHT)

HYDROVIO

Development of reversible
pumps / hydroturbines
with optimized hydrodynamic
and environmental design
for high energy efficiency
and safe fish passage

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SINGLE RTDI STATE AID ACTION
RESEARCH – CREATE - INNOVATE



European Union
European Regional
Development Fund

HELLENIC REPUBLIC
MINISTRY OF
DEVELOPMENT AND INVESTMENTS
SPECIAL SECRETARIAT FOR
ERDF & CF PROGRAMMES
MANAGING AUTHORITY OF EPAnEK

EPAnEK 2014-2020
OPERATIONAL PROGRAMME
COMPETITIVENESS
ENTREPRENEURSHIP
INNOVATION

ΕΣΠΑ
2014-2020
ανάπτυξη - εργασία - αλληλεγγύη
Partnership Agreement
2014 - 2020

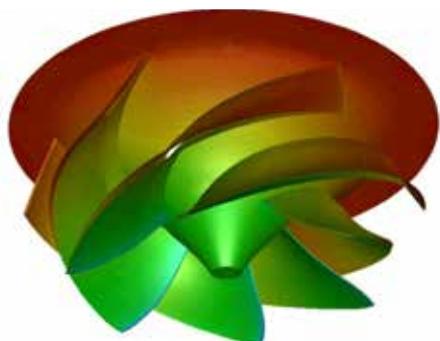
Co-financed by Greece and the European Union

Fish friendly reversible pumps research

For the first time in Greece DPPUMPS and the Laboratory of Hydraulic Turbomachines (LHT) of the NTUA implement a Project, co-financed by the European Regional Development Fund of the European Union and Greek national funds through the Operational Program Competitiveness, Entrepreneurship and Innovation, under the call RESEARCH – CREATE - INNOVATE (project code:T 1EDK-01334) facing the challenge to design innovative reversible pumps / hydroturbines with high energy efficiency and improved ecological behavior, allowing for safe passage of fish fauna.

Project duration 3 years including the following main stages:

- a)** Select of two design areas for reversible pump/turbines of considerable commercial interest and applicability prospects. In these areas two corresponding reversible machines will be parametrically designed and optimized by the LHT, using advanced computational fluid dynamics and numerical optimization tools.
- b)** Design optimization procedure will be carried out for two concurrent goals: Maximize efficiency and minimize impact on passing fish fauna in both directions.
- c)** Selection of one particular machine from each family of optimal solutions (Pareto fronts) and construction of two corresponding complete models. The models will be installed in specially configured test rigs of the partners in order to measure in detail their operating behavior within a load range, and to validate the reliabil-





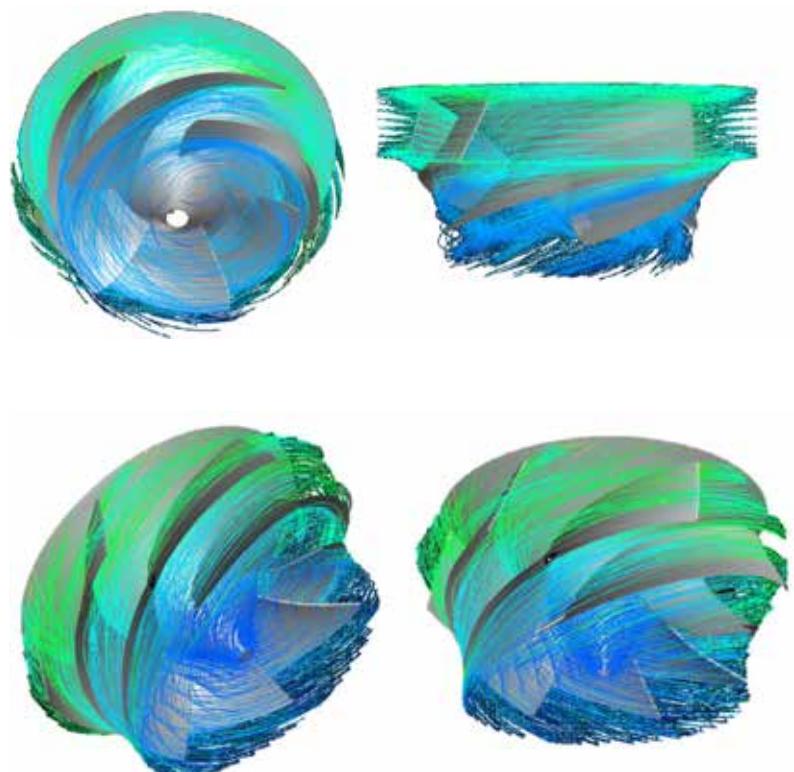
Developing of innovative tools

- a)** Development and application of a cavitation diagnosis system and of a telemetry system for on-line monitoring of machine operation.
- b)** Development of an innovative computational tool that simulates the fish passage through a hydrodynamic machine and correlates with biological data, aiming at creating a general index of assessment of the fish-friendly performance of a machine, depending on its design and the fish species of a specific site.



Benefits from the implementation

- a)** High Survival Rate
- b)** Developing fish friendly rate, as a reference Know – How for implementation of hydrodynamic products.
- c)** Eco - Friendly productivity
- d)** Developing of know – how database





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