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## **EXPERIMENTAL SETUP FOR THE STUDY OF NEW AERATION DEVICES IN HYDRAULIC TURBINES**

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### **Abstract**

The level of dissolved oxygen (DO) in the water downstream hydro power plants is an essential parameter which allows preservation and development of the aquatic habitat. The objective of this paper is to identify a new technical solution that contributes to the increase of DO level in the water passing through the turbine. The current technical solutions improve the DO level but affect the hydraulic efficiency of the turbine. There is no general technical solution for aeration of water used by hydraulic turbines, and every implementation of the aeration devices needs a specific design. Available studies are done directly in site, on Francis turbines which are equipped with different aeration devices. The air injection methods used until now have different energetic characteristics, aeration efficiency and influence over the flow in the turbine draft tube. They are described in the literature, analysed and compared, focused on turbine geometry, injected air quantity and the place of injection. The main parameters important for the aeration process (the air bubbles size, bubble distribution and shape) and its effect over the DO transfer in the turbulent flow cannot be determined from in site investigations because onerous. The paper presents an experimental set-up for the study of air bubble injection parameters over the water aeration process, which is designed to operate with similar parameters of the turbine draft tube flow. Also, aeration parameters are measured and analysed from energetic and ecological point of view.

*Key words:* dissolved oxygen, environmental friendly turbines, experimental set-up for turbine aeration, water quality

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