

## Hydraulic turbine distributor simulation using OpenFOAM

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### Abstract

This paper presents an application of steady state RANS simulations using OpenFOAM for the assessment of flow behavior inside a hydraulic turbine distributor. The analysis is based on the simulation of a single blade passage comprising one stay vane and one guide vane in tandem configuration. Various guide vane operating points are considered, and specialized mesh generation and adaptation algorithms have been developed in order to deal with very small opening angles while avoiding mesh collision between adjacent blades. Verification of periodic surface and symmetry plane boundary conditions for quasi-2D simulations will be presented. Systematic comparisons between simulation results and laboratory tests will be presented as well.

**Key words:** Hydraulic turbine, distributor, validation.