

## Numerical Prediction of Energy Dissipation in Condensing

**Tadeusz Chmielniak**, Włodzimierz Wróblewski, Sławomir Dykas

*Silesian University of Technology, Gliwice, Poland*

In the presented work the analysis of losses (e.g. kinetic energy and entropy loss coefficients as well as an expansion line) in steam expansion flows will be carried out. The adiabatic flow, the flow with homogeneous and with heterogeneous condensation will be considered. The influence of the condensation phenomenon and steam impurity on the losses will be analyzed. The calculations of the steam flow through the Laval nozzle and LP steam turbine stages is going to be presented. The flow is governed by means of RANS equations. For modelling of the steam properties the IAPWS-IF'97 formulations are implemented. It allows to calculate the losses and expansion line for steam flow correctly. The set of governing equations is closed by a real gas equation of state. The numerical computations will be performed using an in-house multi-block code for the analysis of 3-D viscous, turbulent, condensing flows of ideal and real gas and commercial CFD code TascFlow.

[View the extended summary](#)