NUMERICAL SIMULATION AND ANALYSIS OF THERMOHYDRAULIC PROCESS IN EVAPORATION CHANNELS

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According a wide usage of steam generators with boiling channels, mostly applied in energy steam boilers, numerical simulation and analysis of thermohydraulical processes in boiling channels is done in this thesis.

The geometry of boiling channels, where the heat is generated in steam generator, is described at the beginning of the thesis. The phenomenology of steam generation process in boiling channels is presented.

In this thesis, two fluid model was used for the analysis.

Non-stationary one-dimensional homogeneous two-phase flow own model is used for prediction of convective enthalpy transport and boiling boundary location.

The chosen model is compared with other models by the benchmark numerical experiment for the same initial and boundary conditions as well as geometry of boiling channels. Comparing the both groups of obtained results, changes of liquid and steam velocities and change of volume void rate, a good agreement with other models is attained.

The chosen model is also compared with experimental data obtained by measuring on the boiling channels of steam power plant. Good agreement of obtained data and justification of this model application for observing two-phase flow in boiling channels of steam boiler were concluded.