

## Modeling the heat transfer process for steam generation in a vertical pipe

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*At present, different software complexes of computational fluid dynamics (ANSYS CFX, FLUENT, STAR CCM+, etc.) allow the calculation of the boiling process. However, the issues of application of boiling process models, their verification as well as their comparison with current engineering calculation methods used for solving practical problems have not been adequately studied. Engineering methods for calculating of boiling in nuclear power engineering allow estimating the vapor content for a heat exchange surface of simple geometry. There are practically no ways for determination of the vapor content, the structure wall temperature, and other parameters in complex three-dimensional geometry. In this paper, the hydro-gas-dynamic ANSYS CFX package was used to simulate the generation of steam in a vertical pipe. The results of calculation performed in the ANSYS CFX software environment are compared with calculations based on the criterial dependencies and on the experimental data. To substantiate the three-dimensional calculation, the Rensselaer Polytechnic Institute (RPI) Wall Boiling model is used. This model is used in all software complexes of computational fluid dynamics for simulating the boiling process. Verification of this model will make it possible to obtain a qualitative picture of the coolant parameter distribution during boiling for the heat exchange surface of a complex three-dimensional geometry.*

**Keywords:** wall boiling, computational fluid dynamics, heat exchange, heat transfer coefficient

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