

عنوان مقاله:

Numerical investigation of temperature effect on water hammer with cavitation in copper pipe rig

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خلاصه مقاله:

The paper investigates the temperature effect on water hammers in an isothermal pressurized copper pipe rig, for single and two-phase flows. The study concerns pressure wave's intensity, celerity, and attenuation. Also, the volume of cavities created during low-pressure periods is inspected. The mathematical model of hyperbolic equations is described by the dynamic and continuity equations, which have been transformed by the characteristics method into ordinary differential equations. Water hammer solver was built considering two different models of cavitation and column separation, the discrete vapor cavity model and the discrete gas cavity model. In addition to the quasi-steady friction model, two unsteady friction models were incorporated into the code, the convolution-based model proposed by Vardy and Brown and the instantaneous acceleration model proposed by Brunone. The simulations concern temperature range within 4°C to 95°C . Although the single and the two-phase water hammers don't behave in the same manner, the results obtained with the different models, show a significant influence of the temperature

کلمات کلیدی:

Hydraulic transient, Water hammer, Cavitation, Column separation, Unsteady flow

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