

Negative Pressure Waves in Hydraulic Systems

Authors : Fuad H. Veliev

Abstract : Negative pressure phenomenon appears in many thermodynamic, geophysical and biophysical processes in the Nature and technological systems. For more than 100 years of the laboratory researches beginning from F. M. Donny's tests, the great values of negative pressure have been achieved. But this phenomenon has not been practically applied, being only a nice lab toy due to the special demands for the purity and homogeneity of the liquids for its appearance. The possibility of creation of direct wave of negative pressure in real heterogeneous liquid systems was confirmed experimentally under the certain kinetic and hydraulic conditions. The negative pressure can be considered as the factor of both useful and destroying energies. The new approach to generation of the negative pressure waves in impure, unclean fluids has allowed the creation of principally new energy saving technologies and installations to increase the effectiveness and efficiency of different production processes. It was proved that the negative pressure is one of the main factors causing hard troubles in some technological and natural processes. Received results emphasize the necessity to take into account the role of the negative pressure as an energy factor in evaluation of many transient thermohydrodynamic processes in the Nature and production systems.

Keywords : liquid systems, negative pressure, temperature, wave, metastable state

Conference Title : ICFDT 2015 : International Conference on Fluid Dynamics and Thermodynamics

Conference Location : London, United Kingdom

Conference Dates : January 19-20, 2015