

Study of the S-Bend Intake Hammershock Based on Improved Delayed Detached Eddy Simulation

Authors : Qun-Feng Zhang, Pan-Pan Yan, Jun Li, Jun-Qing Lei

Abstract : Numerical investigation of hammershock propagation in the S-bend intake caused by engine surge has been conducted by using Improved Delayed Detach-Eddy Simulation (IDDES). The effects of surge signatures on hammershock characteristics are obtained. It was shown that once the hammershock is produced, it moves upward to the intake entrance quickly with constant speed, however, the strength of hammershock keeps increasing. Meanwhile, being influenced by the centrifugal force, the hammershock strength on the larger radius side is much larger. Hammershock propagation speed and strength are sensitive to the ramp up gradient of surge signature. A larger ramp up gradient results in higher propagation speed and greater strength. Nevertheless, ramp down profile of surge signature have no obvious effect on the propagation speed and strength of hammershock. Increasing the maximum value of surge signature leads to enhance in the intensity of hammershock, they approximately match quadratic function distribution law.

Keywords : hammershock, IDDES, S-bend, surge signature

Conference Title : ICCFD 2017 : International Conference on Computational Fluid Dynamics

Conference Location : London, United Kingdom

Conference Dates : December 18-19, 2017