Modern State of the Universal Modeling for Centrifugal Compressors

Authors : Y. Galerkin, K. Soldatova, A. Drozdov

Abstract : The 6th version of Universal modeling method for centrifugal compressor stage calculation is described. Identification of the new mathematical model was made. As a result of identification the uniform set of empirical coefficients is received. The efficiency definition error is 0,86 % at a design point. The efficiency definition error at five flow rate points (except a point of the maximum flow rate) is 1,22 %. Several variants of the stage with 3D impellers designed by 6th version program and quasi three-dimensional calculation programs were compared by their gas dynamic performances CFD (NUMECA FINE TURBO). Performance comparison demonstrated general principles of design validity and leads to some design recommendations.

Keywords : compressor design, loss model, performance prediction, test data, model stages, flow rate coefficient, work coefficient

Conference Title : ICNMIP 2015 : International Conference on Numerical Methods in Industrial Processes

Conference Location : Paris, France **Conference Dates :** January 23-24, 2015