

A CFD Analysis of Hydraulic Characteristics of the Rod Bundles in the BREST-OD-300 Wire-Spaced Fuel Assemblies

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Abstract : This paper presents the findings from a numerical simulation of the flow in 37-rod fuel assembly models spaced by a double-wire trapezoidal wrapping as applied to the BREST-OD-300 experimental nuclear reactor. Data on a high static pressure distribution within the models, and equations for determining the fuel bundle flow friction factors have been obtained. Recommendations are provided on using the closing turbulence models available in the ANSYS Fluent. A comparative analysis has been performed against the existing empirical equations for determining the flow friction factors. The calculated and experimental data fit has been shown. An analysis into the experimental data and results of the numerical simulation of the BREST-OD-300 fuel rod assembly hydrodynamic performance are presented.

Keywords : BREST-OD-300, wire-spaces, fuel assembly, computation fluid dynamics

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