عنوان مقاله:

Numerical Modeling of Fluid’s Aeration: Analysis of the Power Losses and Lubricant Distribution in Gearboxes

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خلاصه مقاله:

Aeration determines the entrainment of air in another fluid. In geared transmissions, this process affects the operating temperature of the mechanical system because the air’s bubbles trapped in the lubricant act as an insulator. Lubricant’s aeration occurs mainly because the gears’ teeth entering the oil sump and the oil impacting on free surface. Being able to numerically model aeration is fundamental to better describe the physics and the lubrication mechanisms which affect the behavior of the system. In this paper, a new solver that includes the aeration phenomenon was implemented in the opensource environment OpenFOAM®. The simulations’ results were validated with torque measurements. Moreover, a comparison of the oil distribution between a standard multiphase- and the new aeration-solver is provided.

کلمات کلیدی:

CFD, aeration, power losses, lubrication, gearboxes