عنوان مقاله:

Dynamic simulation of a flexible rotor-hydrodynamic bearing model considering oil flow turbulence effects and wear in bearing

محل انتشار:

نهمین کنفرانس بین المللی آکوستیک و ارتعاشات (سال: 1398)

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خلاصه مقاله:

Hydrodynamic journal bearings are used in rotating systems operating in high speeds and un-der heavy static loads. Since these bearings work at high speeds, the lubricant flow is prone to be in turbulent regime in some locations. Moreover, these bearings experience wear in low speeds when there is not sufficient oil-film to separate the journal surface from the bearing surface. Static and dynamic effects of turbulent flow and geometric imperfection in bearings due to wear are analysed in this work. Wear analysis is performed through modifying the oil-film thickness relation to consider increase in clearance of a worn part of the bearing. Then, the modified Reynolds equation is solved to study the effects induced by turbulent flow and wear. It is seen that turbulent flow reduces maximum hydrodynamic pressure, and, wear causes the rotor to orbit in a lower position. Finally, the unbalance response of the rotor-bearing system is simulated undergoing constant and variable rotating speeds.

کلمات کلیدی:

Journal bearings; Wear; Turbulence effect; Dynamic behaviour.