A 35,000 RPM TEST RIG FOR MAGNETIC, HYBRID AND BACK-UP BEARINGS

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ABSTRACT

Magnetic bearings have long offered the potential for significant turbomachinery system improvements due to their oil-free, non-contact, low loss nature and their ability to actively control shaft dynamic motion. However, end-users and many designers are hesitant to apply this technology. There are two basic stumbling blocks: active magnetic bearings (AMBs) have little overload capacity, and failure of any portion of the AMB system could result in catastrophic damage to the machine. To cope with both of these problems, a secondary back-up bearing must be included in the system. This paper describes a new full scale, high speed test rig which has the capability to test a variety of back-up bearings at speeds of up to 35,000 RPM, and bearing loads of up to 6.7 kN. Preliminary data for two novel back-up bearings are presented as a demonstration of the test rig's capabilities.