

**GT2007-27825**

**ON THE COUPLING OF FOIL BEARING SUPPORTED ROTORS: PART 2– EXPERIMENT**

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**ABSTRACT**

The expanded application of high-speed rotor systems operating on compliant foil bearings will be greatly enhanced with the ability to adequately couple multiple shaft systems with differing bearing systems and dynamic performance. In this paper the results of a successful experimental program are presented. Test results are presented for three different foil bearing coupled rotor systems. First, a coupled 32 kW, 60,000 rpm induction motor drive supported on compliant foil bearings was coupled to an identical 32 kW 60,000 rpm generator rotor and operated to full speed. Next, a high-speed 30,000 rpm capable ball bearing mounted precision spindle was driven to full speed when coupled to a 32 kW foil bearing supported drive motor. Third, the 32 kW, 60,000 rpm foil bearing based motor drive was coupled to a foil bearing supported rotor having a bending critical speed at approximately 29,000 rpm. This combined system was operated successfully to 60,000 rpm. Results of this experimental test program confirm the rotor-bearing system dynamic analysis and demonstrate the feasibility of coupling foil bearing supported rotors to a wide array of other rotor-bearing systems.