

NEW!*Simple Yet Effective Models for Rotating Machinery*

ROTOR DYNAMICS

Agnieszka (Agnes) Muszynska • *A.M. Consulting, Minden, Nevada, USA*A volume in the **Dekker Mechanical Engineering** series • Lynn Faulkner, *Battelle, Columbus, Ohio, USA*

THE AUTHORITATIVE GUIDE TO ACCURATE DIAGNOSIS OF ROTATING MACHINE MALFUNCTION

As the most important parts of rotating machinery, rotors are also the most prone to mechanical vibrations, which may lead to machine failure. Correction is only possible when proper and accurate diagnosis is obtained through understanding of rotor operation and all of the potential malfunctions that may occur. Mathematical modeling, in particular modal modeling, is key to understanding observed phenomena through measured data and for predicting and preventing failure.

Rotordynamics advances simple yet adequate models of rotordynamic problems and phenomena related to rotor operation in its environment. Based on Dr. Muszynska's extensive work at Bently Rotor Dynamics Research Corporation, world renowned for innovative and groundbreaking experiments in the field, this book provides realistic models, step-by-step experimental methods, and the principles of vibration monitoring and practical malfunction diagnostics of rotating machinery. It covers extended rotor models, rotor/fluid-related phenomena, rotor-to-stationary part rubbing, and other related problems such as nonsynchronous perturbation testing. The author also illustrates practical diagnoses of several possible malfunctions and emphasizes correct interpretation of computer-generated numerical results.

Rotordynamics is the preeminent guide to rotordynamic theory and practice. It is the most valuable tool available for anyone working on modeling rotating machinery at the machine design stage or performing further analytical and experimental research on rotating machine dynamics.

Features

- Provides consistent theory of rotor dynamic behavior based on simple modal models that are supported by practical identification procedures
- Includes extensive references at the end of each chapter for more in-depth study of each topic
- Demonstrates identification of modal models through a novel perturbation testing, with detailed discussion of the method for easy reproduction of the experiments
- Contains hundreds of figures and tables, a glossary, an index, and numerous practical case studies that demonstrate diagnosis of specific malfunctions in rotating machines

Contents

Basic Rotordynamics: Two Lateral Mode Isotropic Rotor	Selected Topics on Rotordynamics
Vibration Monitoring of Rotating Machinery	Vibrational Diagnostics of Rotating Machinery
Basic Rotordynamics: Extended Rotor Models	Malfunctions Illustrated by Basic Mathematical Models of the Rotor System
Fluid-Related Problems in Rotor/Stator Clearances	Appendices
Rotor-to-Stationary Part Rubbing Contact in Rotating Machinery	Glossary
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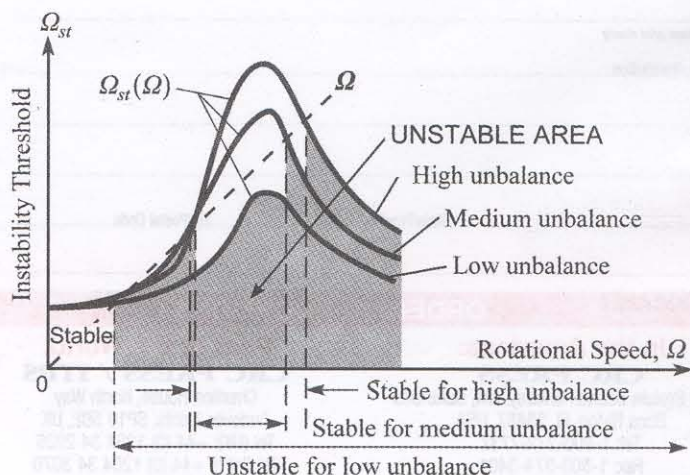


Fig. 6.8

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