

Successful Completion of

Training Program

Theoretical and Experimental Vibration Analysis Applied to Machine Elements Health Diagnostics

(April 25 - 26), 2008

Venue: Taj Residency, Vadodara, Gujarat, India

Organized By:

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Introduction

Vibration is a universal phenomenon in all dynamic systems. Engineers worldwide try to mitigate vibration when undesirable. This training program is aimed at providing a comprehensive coverage to vibration phenomenon, its physics and measurement techniques and details on how to use the vibration signature from a machine to diagnose defects and also an insight into solving vibration problems. After completing the training program you will be able to measure and analyse vibration data to identify defects and will be able to solve vibration problems effectively.

Training Program - Theoretical and Experimental Vibration Analysis Applied to Machine Elements Health Diagnostics
(April 25 - 26), 2008, Venue: Taj Residency, Vadodara

Quantum Age Tech Solutions Pvt. Ltd.

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Training Program Topics

A. Basics

- a) Periodic Motion and Oscillations
- b) Single and Multi Degree of Freedom Systems
- c) Prerequisite Physics
- d) Vibration Parameters
- e) Vibration to Noise Journey
- f) Linear Scales vs. Logarithmic Scales
- g) Filters
- h) Initial Discussions on Frequency Analysis
- i) Time Domain Vs. Frequency Domain Analysis
- j) Vibration Sources:
 - i. Rotary Motion
 - ii. Reciprocating Motion
 - iii. Random Excitation - Road Transport

B. FFT Spectrum Analyzer

- a) What is spectrum
- b) Operation of a Spectrum Analyzer
- c) Sampling Techniques

C. Vibration Measurement Transducers

- a) What Parameters to Measure

D. Advanced Signature Analysis Techniques

E. Elementary Problem Diagnosis as Applicable to Various Machine Elements

- a) Gears
- b) Rolling Element Bearings
- c) Electrical Motors
- d) Pumps
- e) Compressors
- f) Engines
- g) Couplings

F. Vibration Isolation

G. Vibration Limits & Standards

Vibration Measurement Hardware & Software - Display & Demonstration:

Kistler Corporation

National Instruments

Principal Faculty:



Rajeev Dubey (M. Tech. – IITK, 1993), Managing Director, Quantum Age Tech Solutions Pvt. Ltd

Paper Publications: “Hermetic Compressor Noise Control...”, Intl. Cong. On Sound and Vib., Adelaide, Australia, 1997

Key Achievements: Tyre tread noise simulation algorithm, noise and vibration control of in operation compressors, gears, pumps, etc. and contribution to the development of design methodologies for low noise and vibration mechanical systems

Experience: 14 years, Noise and vibration (simulation, measurement and control), Development of algorithms for noise and vibration signature analysis for defect identification, FEA, CFD, Consultancy on product design

Earlier Training Programs Conducted For: Apollo Tyres, L&T, L&T Chiyoda, CEAT, Crompton Greaves, Hero Honda, GE, Vulcan Gears, Mahindara & Mahindra, etc.

Faculty on Measurement Systems:



Gurdas Singh (B. E. Instrumentation – SLIET, 2001), GM, Quantum Age Tech Solutions Pvt. Ltd.

Paper Publications: Gear Health Diagnostics Using Vibration Signature, National Instruments User Conference, India, 2006

Key Achievements: Development of Laser Sensor Based Surface Profilometer, Development of Automotive Clutch Bearing Endurance Test System Using Vibration and other signals

Experience: 6 years, Noise and vibration measurement, Machine control

Earlier Training Programs Conducted For: Tata Johnson Controls, Bharat Seats, Apollo Tyres, etc.

Invited Lectures:

“Accelerometer Technology, Selection Criteria and Demonstration”



Kuno Marschall, MIES, MSc, Kistler Corporation

Kuno Marschall has more than 20 years working experience in test and measurement. After graduating from the University of Wuppertal, Germany in 1981 with a Masters Degree in Mechanical Engineering he worked for more than 10 years as an application engineer for destructive material testing machines and systems. In his current position he is the Managing Director of Kistler Instruments Pte Ltd, Singapore as well as Technical Adviser for Asia. He has been involved in numerous measurement projects with customers in Asia and abroad and is conducting regular training courses on Instrumentation for engineering measurements.

“Special Considerations and Sampling Techniques for Vibration Data Acquisition,”

National Instruments, India



“Crack Detection, Localisation and Sizing in a Shaft based on Vibrations”



Prof. Rajiv Tiwari, Dept. of Mechanical Engg., IIT Guwahati

Paper Publications: More than 60 journal and conference papers on vibrations and bearing design.

Consultancies: ISRO, Trivendrum; Combat Vehicle R&D Establishment, Chennai; Tata Bearings, Kharagpur; Lafarge Cement, Meghalaya; Skoda Power, Czech Republic.

Organization of Symposium & Courses: National Symposium on Rotor Dynamics (NSRD-2003), Five day course on Rotor Dynamics in year 2004 and 2005.

Key Position: Research officer at University of Wales Swansea, UK during Jan-Dec 2001

Research Interest: Vibrations, Rotor Dynamics, Signal Processing & Identification in Rotating Machineries, and Rolling Element Bearing Design and Analysis.