Vibration Based Machine Condition Monitoring and Fault Diagnosis

INSTRUCTORS

Chris Mechefske PhD, P. Eng

Markus Timusk, PhD, P. Eng

COURSE DATE

June 16—20, 2014

LOCATION

Willet Green Miller Centre
Room #B4048 (4th floor)
933 Ramsey Lake Road
*Sudbury, Ontario*
P3E 2C6

CERTIFICATION

Arrangements can be made for participants of the workshop to write the ISO 18436-2 compliant certification exam immediately following the course. Many sample questions will be reviewed during the training course.

(Exam fee not included in the course fee)

World Class Training that meets International Standard ISO 18436-2 requirements

During the past 30 years, condition based maintenance has evolved as a significant opportunity to increase profits within a wide variety of industries. Vibration analysis is one of the most powerful condition based maintenance technologies, and the cornerstone of many predictive maintenance programs. It is also widely utilized for troubleshooting and fault diagnosis of machinery and structures.

This course is designed to provide a practical overview of system components, installation considerations, and the benefits of vibration based monitoring. The course will provide a detailed examination of the detection, location and diagnosis of faults in rotating and reciprocating machinery using vibration analysis.
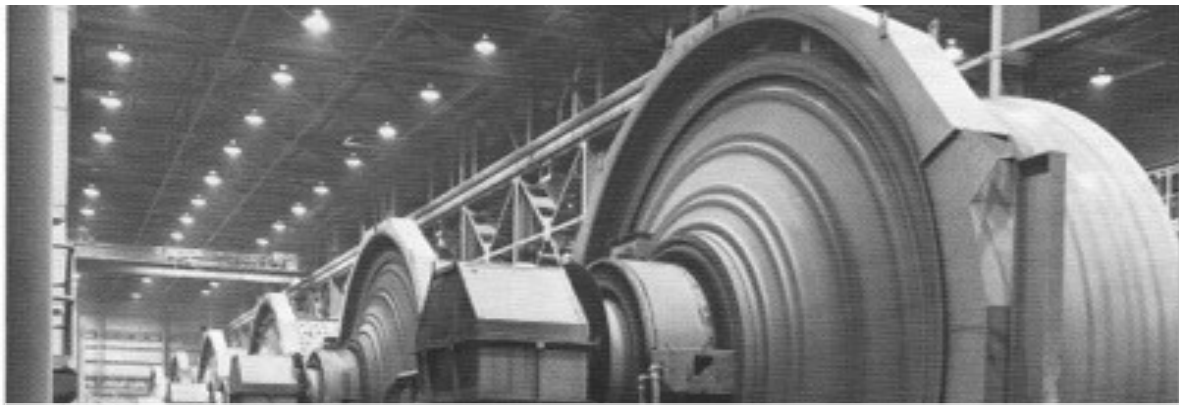
Who should attend?

This course is suitable for maintenance, reliability, process control and instrumentation personnel who wish to gain, improve and/or update their knowledge and skills related to the practical aspects of machinery vibration monitoring, analysis and predictive maintenance. This includes engineers, maintenance supervisors, mechanical technicians and technologists as well as other technical staff.

What you will get out of it?

Personnel certified to Category II require all the knowledge and skills expected of Category I, and shall also be qualified to:

○ select the appropriate machinery vibration measurement technique,

○ set up instruments for basic resolution of amplitude, frequency and time,

○ perform basic vibration analysis of machinery and components, such as shafts, bearings, gears, fans, pumps and motors, using spectrum analysis,

○ maintain a database of results and trends,

○ perform basic (single-channel) impact tests to determine natural frequencies,

○ classify, interpret and evaluate the test results (including acceptance tests) in accordance with applicable specifications and standards,

○ recommend minor corrective actions,

○ understand basic single-plane field balancing concepts, and

○ be aware of some of the causes and effects of bad measurement data.

MIRARCO MINING INNOVATION

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Professor Chris Mechefske, PhD, P. Eng.

Chris Mechefske is an expert in the area of signal processing and mechanical fault diagnosis. He received his undergraduate training at the University of Guelph in Canada (1989) and Ph.D. at Monash University, Australia (1992). He is currently a Professor in the Department of Mechanical Engineering at Queen's University. His main research areas cover 1) system dynamic analysis and design optimization, and 2) vibration based machine condition monitoring and diagnosis. Ongoing projects include the dynamic analysis and design of systems (aircraft fuselage structures, mining vertical conveyance systems) and machine condition monitoring and diagnostics (parametric spectral estimation, remote equipment monitoring systems, imbedded monitoring systems, automatic machinery fault diagnosis).

Professor Markus Timusk, PhD, P. Eng.

Markus Timusk is an expert in the design of fault detection systems for machinery. Markus Timusk is a professional engineer, founding program coordinator and an associate professor of Mechanical Engineering at the Bharti School of Engineering at Laurentian University in Sudbury, Ontario, Canada. His research interests focus on the development of automated, fault detection systems for machinery and supporting subject matter like mechatronics, pattern recognition, machine measurement, vibration analysis and signal processing. Application areas include the mining, automotive, and space industries. He completed a Ph.D. in Mechanical Engineering at Queen's University in Kingston, Ontario Canada in 2006. His Masters of Engineering Science and Bachelor of Engineering Science were both completed at the University of Western Ontario, in London, Ontario Canada in 2001 and 1999 respectively.

Course outline

- Principles of Vibration of Machinery
- Data Acquisition and Instrumentation of Machinery
- Signal Processing
- Condition Monitoring
- Fault Analysis of Machinery
- Corrective Action of Machine Faults
- Equipment Knowledge
- Acceptance Testing
- Equipment Testing and Diagnostics
- Reference Standards
- Reporting and Documentation
- Fault Severity Determination

Course fee: CAD $3,250.00 (+ hst)

Includes

○ A comprehensive set of course materials.
○ Lunch and refreshments served each day.

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933 Ramsey Lake Road
Sudbury, Ontario

Travel arrangements and accommodation are the participants responsibility. A list of hotels can be provided upon request.

Contact

For information about the course

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To register

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