DAY 1

Understanding Failures

- Machine Failure Analysis
    - Wear and Tribology
    - Fatigue Mechanisms
    - Plain, Tilt-pad and Anti-friction Bearing and Seal Failures

DAY 2

Reliability Fundamentals and Methods for Avoiding Failures

- Fundamentals of Reliability of Machinery
- Reliability Determination and Assessment Methods
- Statistical Analysis of Machinery Failures
- Workshop and Case Study

DAY 3

Understanding Predictive Maintenance

- Predictive Maintenance Concepts
    - Introduction
    - Maintenance Strategies
    - Predictive Maintenance – *Background and History*
    - Predictive Maintenance Technologies – *An Overview*
    - Potential Failure Analysis – *Deciding which Technologies to Apply*
- Vibration Analysis
    - Introduction to Vibration Analysis
    - Frequency Analysis and the Fast Fourier Transform
    - Vibration Transducers
    - Basic Failure Mechanisms with Examples

DAY 4

Using Predictive Maintenance

- Vibration Standards and Alarm Levels

- Vibration Diagnostics
- Amplitude Demodulation – *a.k.a Enveloping, SSE, HFD, Peak-Vue*
- Vibration on Rolling Element Bearings
- Resonance – *Identification & Cure*
- Other Predictive Maintenance Techniques
    - Infrared Thermography
    - Thermographic Applications
    - Passive Ultrasonics - *Contact and Non-contact*
    - Ultrasonic Applications
    - Tribology – *Oil Analysis*

DAY 5

Control Mechanisms

- Managing Predictive Maintenance
    - Performance and Efficiency Monitoring
    - Managing the Predictive Maintenance effort
    - Cost Analysis
    - Reporting Techniques
    - Integrating Predictive Maintenance into the Maintenance Plan