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Course Costs:

Oklahoma Company: \$450

**Out-of- State Company:
\$650**

**Contact Charles Madison
for additional details**

Who Should Attend:

- Maintenance Managers
- Foremen
- Technicians
- Engineers

**Anyone
in the maintenance field**



3-Day Program: “Motor Predictive Maintenance”

September 20-22, 2010

Hosted by

Tulsa Tech Center
3638 South Memorial Drive, Tulsa OK



**Shermco
Industries**

These days, employee turnover is a reality, pre-trained employees are a luxury, changing technology and responsibilities are inevitable and contractors don't come cheap. That's why training is essential to the health of your facility and electrical system.

Predictive maintenance for large electric motors has generally consisted of traditional tests used to determine the condition of the groundwall insulation of the stator and the integrity of the rotor bars. These tests are trended and an attempt is made to estimate the remaining life of the motor by analyzing the past performance of motors under study.

An alternate scheme is proposed which consists of some traditional tests correlated with new techniques. Capacitance tests, balance of resistance tests, and balance of inductance tests are not used widely today. Another promising predictive test indirectly measures the negative sequence currents which are produced by the fault. Furthermore, there is some discrepancy as to how to perform and analyze common procedures which can yield useful information.

**Registration will be limited to the first 15 OPMUG
members that register**

**Attendees will receive a Certificate of Completion with
credit for contact and professional hours. Register on
this website to reserve a seat for this session**

**<http://www.opmug.net/> Or Call Charles Madison
(918) 828-5411**

Motor Predictive Maintenance (PdM) (Vibration Analysis and Alignment) 16 Contact Hours

Who Should Attend:

Designed for electricians, technicians, field engineers, supervisors and others with the responsibility of testing and maintaining motors. Preventive Maintenance (PM) is compared to Predictive Maintenance (PdM) and the benefits and drawbacks of each are discussed. Attendees will learn proper alignment techniques, how to determine the vibration severity, how much vibration is harmful and how to correct problems causing vibration, enhancing their productivity and eliminating damage to expensive motors and connected equipment.

Course Description:

Vibration and improper alignment are one of the leading causes of motor failures. Attendees will learn why vibration is damaging, how to measure, diagnose and correct vibration issues. Motor electrical testing is covered in detail, as well as bearing selection. Alignment considerations, alignment calculations, couplings and specifications are all covered in detail. Attendees will use a variety of field test and alignment equipment to ensure they can perform these critical functions on the job. Lecture sessions are alternated with hands-on lab sessions to optimize learning.

Lab vs. Lecture Time:

This course is designed to have approximately 40% hands-on lab sessions. The total lab time may vary with each class. Attendees should have basic electrical skills training, as well as some field experience. The level of the course will be adjusted for the actual participants.

I. Introduction

- A. Comparison of Predictive vs. Preventive
- B. Vibration – How Much is Too Much?
- C. Other Forces at 1x RPM
- D. Vibration Data Collection
- E. Exception Reporting

- D. Current Signature Analysis (Rotor Bar Condition)
- E. Core Testing & Rewind
- F. Bearing Selection Considerations
- G. Electrical-Related Vibration (Soft Foot)

II. Vibration Analysis

- A. Signature Analysis
- B. Anti-Friction Bearing Defects
- C. Lubrication Guidelines

VI. Pre-Alignment Considerations

- A. Shaft Run Out
- B. Coupling Run Out
- C. Excessive Clearances
- D. Lift Check
- E. Soft Feet

III. Enhancing Vibration Diagnosis

- A. Running Soft Foot Checks
- B. Stroboscopic Views
- C. Shaft Run Out
- D. Coupling Inspections

VII. Couplings & Specifications

- A. Gear, Lovejoy, Faulk
- B. Disk Pack
- C. Elastomeric

IV. Plant-Specific Applications

- A. Visit Selected Equipment
- B. Lab on Lubrication While Monitoring Bearing Vibration
- C. Lab on Spectrum Analysis

VIII. Alignment Lab

- A. Selecting Alignment Equipment
- B. Set Up of Equipment
- C. Alignment Calculations
- D. Taking Measurements & Graphing
- E. Collecting Alignment Data
- F. Calculating Corrections
- G. Executing Alignment Moves
- H. Rechecking Alignment

IV. Electric Motor Diagnosis

- A. Visual Inspection & Cooling (Insulation Life)
- B. Ground Wall Insulation Test
- C. Surge Comparison Test (Turn-to-Turn)

FOR ADDITIONAL COURSE INFORMATION CONTACT

Charles Madison Tulsa Tech Center
(918) 828-5411 charles.madison@tulsatech.org

****Course Cancellation Policy****

A training class can be cancelled when, less than 75% funded and is less than 30 days from the start of class (training). In this case there will be a 100% fee refund for registered participants. If a registered participant cancels less than 10 days before the start of class (training) they will forfeit 50% of the registration fee.