



**INSTRUCTOR BIOGRAPHY** — Bill Kruger combines 40 years of practical field engineering and maintenance experience with proven instructional techniques, including visual aids and demonstrations. Participants return to the plant able to immediately apply their learnings.

**FIVE DAY SYLLABUS**

**PRECISION MAINTENANCE COURSE**

**Sydney: 17-21 May 2010**

Integrating practical Bearing Assembly, Oil Analysis & Dynamic Analysis to extend your machines lives

1. How to extend Bearing and Seal Life
  - Film thickness vs. friction and load wear vs. machinery life
  - Establishing an on site oil analysis program
2. Creating the Mental Model
  - Rotor behaviour, bearing clearances, orbits, energy waste, seal wear and bearing life
  - Vibration terminology, why & how machinery behaviour creates the vibration pattern and how to relate them
3. How to find most common failures
  - Resonance: Mass/Stiffness relationships, effects of resonance (*Fatigue, Energy Loss*)
  - Unbalance: Cause/Effect, shop field balance considerations and limitations
  - Misalignment: Cause/Effect, foundations & bases, determining thermal growth, precision alignment tolerances
4. Separating Sources occurring at 1X running speed
  - Identifying & preventing unbalance, misalignment, bent shaft, eccentricity and resonance
5. How to fix problems forever
  - Proper-bearing installation and maintenance techniques.
  - On-site analysis to maximize bearing and seal life
6. Electrical Theory for Motor Diagnostics
  - Motor and Transformer Theory
7. Motor Faults — Multiple Technology (*Electrical & Mechanical*)
8. Introduction to Motor Circuit Analysis (*Off-line Testing*)
  - Three Phase AC Motors
  - DC Motors
  - Transformers
9. Introduction to Electrical Signature Analysis (*On-line Testing*)
  - Understanding the FFT and Interpretation of Electrical Signatures
10. Developing a Motor Diagnostics Program
  - Estimating Time to Failure
11. Real World Program Considerations
  - How to establish goals and objectives
  - Financial considerations
  - How to recognise and correct troublesome equipment
  - How to determine if you are getting the most from your condition monitoring equipment or program

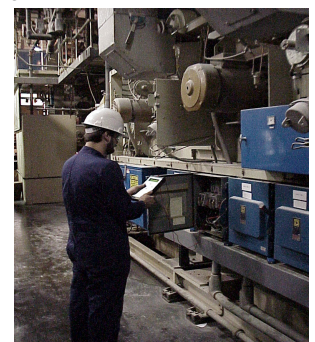
**FIVE DAY SYLLABUS**

**MOTOR DIAGNOSTIC WORKSHOP**

**Sydney: 10-14 May 2010**

To improve Motor System Reliability

1. Introduction to Electrical Reliability (*Maintenance Philosophies*)
2. Electrical Theory for Motor Diagnostics
  - Motor and Transformer Theory
3. Motor Faults — Multiple Technology (*Electrical & Mechanical*)
4. Mechanical Considerations
  - Alignment Considerations
  - Balance Considerations
  - Lubrication
5. Introduction to Motor Circuit Analysis (*Off-Line Testing*)
  - Three Phase AC Motors
  - DC Motors
  - Transformers
6. Hands on Testing Off-line
  - Interpretation of Data
  - EMCAT Software
  - DC Motor Testing
  - Transformer Testing
7. Introduction to Electrical Signature Analysis (*On-line Testing*)
  - Understanding the FFT
8. Understanding Dynamic Faults (*Electrical & Mechanical*)
  - Static Eccentricity
  - Dynamic Eccentricity
  - Unbalance, Alignment
  - Gear Problems
  - Bearing Faults
9. Hands On Testing Using the ATPOL
  - Introduction to EMCAT On-line Software
  - Interpretation of Electrical Signatures
10. Developing a Motor Diagnostics Program
  - Estimating Time to Failure



**SEE OVER FOR ENROLMENT FORM**

To all who complete the training event(s) a certificate will be issued for Professional Development Record Purposes

## PRECISION MAINTENANCE COURSE

**What is it about?** Lowering maintenance costs and maximising machine reliability using field proven "Precision Maintenance" methods and procedures. Learn how to extend machinery life and prevent most machine failures from occurring

Actual Case histories are used to teach Root Cause Analysis Techniques, also, frequent misinterpretation and misapplication of industry standards are explored as major causes of machinery problems.

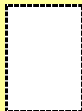
This course provides the fundamentals necessary to implement precision maintenance from both a mechanical & electrical prospective in your facility and to ensure maximum payback is obtained from your equipment investments.

**Who should Attend these Training Events?** Designed for maintenance planners and supervisors, reliability engineers, predictive maintenance, trades and operations personnel, in fact, anyone who is interested in improving plant operation. Participants return to the plant able to immediately apply their learnings. Those who understand the power of the solutions provided are best able to utilise equipment and notably reduce unnecessary machinery problems.

## MOTOR DIAGNOSTIC WORKSHOP

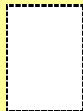
**What is it about?** Improving Motor System Reliability "any type, any size". Using unique, purely "Non Destructive" testing methods and procedures. Includes commissioning new or repaired electric motors; diagnose winding faults quickly and accurately; identify rotor health, incoming power quality and drive wellbeing; plus, driven load mechanical health. Trending condition over time and distinguish what is NOT faulty. Case histories/exercises are delivered in a conducive learning environment.

This event provides the fundamentals necessary to implement an electric motor management program and ensure maximum payback is obtained from equipment investments. New product enhancements are also to be discussed.



**SYDNEY — 5 DAYS**  
**Precision Maintenance**  
17-21 May 2010

AUD\$2,790.00 (Ex. GST) ea.



**SYDNEY — 5 DAYS - new & enhanced**  
**Motor Diagnostic Workshop**  
10-14 May 2010

AUD\$2,790.00 (Ex. GST) ea.

*5% Discount for 3 or more attendees!*

**FEES INCLUDE:** Lunch, refreshments & course material.

**Registration 8:15am Finish 4:30pm daily.**

**Accommodation booking required?**

Venue: Sydney - TBA



### Registration Details

**NAME:** \_\_\_\_\_

**POSITION:** \_\_\_\_\_

**COMPANY:** \_\_\_\_\_

**DEPARTMENT:** \_\_\_\_\_

**ADDRESS:** \_\_\_\_\_

**STATE:** \_\_\_\_\_ **POSTCODE:** \_\_\_\_\_ **EMAIL:** \_\_\_\_\_

**TELEPHONE:** \_\_\_\_\_ **FAX:** \_\_\_\_\_

#### Notes

1/ To ensure seat allocation, an official company purchase order should be lodged upon enrolment; payment can be made by Credit Card or Telegraphic Transfer (*please telephone the Sydney office for banking details*).

2/ Cancellation policy: a 50% refund will be made for cancellations 10 or more working days before commencement of the course. If less than 10 working days, no refund can be given. For fees already paid, you may send a replacement participant.

#### Please select method of payment:

VISA  MASTERCARD  BANKCARD

**PURCHASE ORDER #:** \_\_\_\_\_

**NUMBER:**

**EXPIRY DATE:** \_\_\_\_\_

**NAME ON CARD:** \_\_\_\_\_

**SIGNATURE:** \_\_\_\_\_

**Please either fax, email or post the registration form to secure a place now (duplicate form as required)**