**Gas Turbine Condition & Life Assessment**

Minimise Failures & Prolong Asset Life

A comprehensive examination of condition and life assessments for gas turbines that are aimed at improving gas turbine operational and maintenance practices, minimising the likelihood of failures, prolonging asset life and reducing maintenance costs.

**Course Director**

Dr Matt Smillie

Dr Matt Smillie has over 15 years’ experience in the condition and life assessment of gas turbine hot gas path components and in gas turbine material degradation mechanisms such as creep, oxidation and thermal fatigue.

**Key Learning Outcomes**

- Develop a detailed knowledge of material systems employed in gas turbines
- Understand degradation mechanisms present in gas turbines and how to predict and monitor them
- Determine optimal linkages between condition assessments, including mechanical and non-destructive testing, fracture mechanics and stress modelling used in the analysis of gas turbine components
- Systematic and practical management of gas turbine components
- Examine and evaluate various tools required to produce technically proficient tenders for repair or replacement of high value components
- Risk management mechanisms in relation to repair and maintenance
- Key competencies for management decision making on overhaul scheduling and condition assessment techniques

**2012 2 Day Course Dates**

Brisbane  16–17 February

**VALUE ADD**

Two instructors for the price of one! This course will also feature guest presenter Dr Sean Norburn.

**HOW TO SAVE**

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CALL 02 9080 4077 for on-site options
Assessment of the condition and remnant useful life of a number of gas turbine components is a key factor in achieving safe and economical operation of industrial gas turbines. The durability and need to overhaul and replace parts such as blades and stators, combustor liners and transition ducts – as well as manage the safe usage of fracture critical rotating parts such as discs and shafts – plays an important role in determining the frequency and scope of maintenance intervals, the occurrence of forced outages and the total lifetimes achieved.

These factors determine the Reliability, Availability and Maintainability (RAM) of simple cycle and combined cycle turbines and contribute significantly towards through life plant operating costs.

This course will review the current practices for condition assessment and life management of gas turbine hot gas path components, as well as the methods available for remnant life assessment of discs and shafts.

Who Should Attend

Gas and steam turbine owners and operators, operations and maintenance engineers, mechanical engineers, power station managers, plant operations managers, asset and generation engineers/management, turbine engineers, gas turbine parts/components and suppliers

About the Course Director

Dr Matthew Smillie

Matthew has over 15 years’ experience in the condition and life assessment of gas turbine hot gas path components and in gas turbine material degradation mechanisms such as creep, oxidation and thermal fatigue. Currently he is a Consultant Engineer for Quest Integrity NZ Ltd, where he undertakes life assessment and failure analysis of high temperature components, including steam path components from thermal power plant and high temperature pipework in petrochemical plants.

Matthew specialises in mechanical engineering and condition assessments of high temperature alloys, providing specialist advice on repair technologies, gas turbine materials and coatings and undertaking root cause failure investigations. He performs engineering reviews, addresses reliability issues, and conducts hot gas path component tendering specifications and engineering analysis of OEM maintenance intervals for optimum operation. He also has extensive knowledge of manufacturing processes, quantitative metallography/image analysis, electron microscopy, finite element analysis, materials testing and design engineering.

Matthew’s particular turbine experience includes condition assessment and failure analysis of gas turbine components such as compressor blades combustors, turbine blades and vanes, exhaust diffusers and ducting across a wide variety of machines (e.g. GE LM2500, LM6000, LM6000, LMS100, MS6001B, MS9001E, MS9001FA+e; Westinghouse 501D4 and 501 D5A; Siemens V94.2 and V94.3A; ALSTOM GT26B, GT13E2, GT10B, Cyclone, TB5000; Solar Taurus 60). He has been providing gas turbines training for over 5 years.
A brief introduction to gas turbine technology

**Gas turbine materials**
- Materials used in the compressor, combustor, turbine and rotor
- What is a hot gas path?
- Understanding the metallurgy of hot gas path components
- Coatings – what are they and why are they used?

**Gas turbine degradation mechanisms**
- Learn the main types of materials degradation mechanisms
- Understand the operation and failure mechanism of hot gas path components

**Condition and life assessment**
- Why undertake condition and life assessment?
- Learn how to perform a condition assessment
- Become familiar with the parts that can be life assessed and what information you require to achieve this
- How to select an appropriate assessment procedure to facilitate optimisation of component life and repair cycles
- Step by step approach to life assessment analysis
- How coatings can affect component life
- The various coating options available
- Examining which repairs extend life and which don’t

**Turbine disc life assessment**
- Turbine discs/wheels
- Understand key damage mechanisms that occur and where they occur
- The importance of thermo-mechanical stress analysis
- Time based versus condition based remaining life
- NDT requirements – what techniques should be used
- Step by step analysis of the disc life assessment process
- What is involved with inspection planning

**Repair techniques**
- Why repair hot gas path components?
- What components can be repaired or reclaimed successfully?
- Understand the main processes used for repair

**Tendering for repair/replacement of parts**
- Understand the importance of the information gathering process
- Assess what is critical information and what is good to have
- How do you ensure quality assurance requirements?
- Developing a knowledge of the selection process
- Learn how to produce technically proficient tenders
- Comparing different tenders – key factors to look for
- Auditing the repair process

**VALUE ADD**

*Two instructors for the price of one!* This course will also feature guest presenter Dr Sean Norburn who has over 15 years of experience in structural analysis and life assessment across a broad range of engineering applications, including aero engines, power and industrial gas turbines

For those who are members of professional associations, our courses are eligible for Continuing Professional Development. Please see your individual associations to learn how.
EASY WAYS TO REGISTER

3 EASY WAYS TO REGISTER

WEB

Telephone
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REGISTER EARLY & SAVE OVER $220!

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REGISTER ONLINE NOW FOR GAS TURBINE CONDITION & LIFE ASSESSMENT

Course Details
Course registration 8:15am
Course commencement 8:30am
Course conclusion 5:00pm
Break times customised to suit participant requirements

Course Outline
IIR Executive Development reserves the right to alter the venue and/or instructor(s). The course outline/details advertised are to be used as a guide only. The outline/details advertised may be changed at any time during the course delivery.

Customised Approach
The course times advertised act as a guide and may change slightly depending on the depth of interactive class discussion and case analysis.

Dress Code
Smart casual wear is suggested along with a jacket as room temperatures vary.

Course Suitability
If clarification is needed for course suitability/relevance, please contact us.

Privacy Policy & Updating Your Details
Please visit us online at www.iired.com.au/privacy for a full privacy policy. Database amendments can be sent to database@iir.com.au or by calling +61 2 9080 4050 asking for the database department.

Payment Terms
Full payment must be made upon receipt of the invoice and at least 10 working days prior to the course. Only those participants whose fees have been paid in full will gain admittance to the course. A fax invoice and confirmation letter will be emailed to the participant upon completion of a valid registration. Payment may be made by EFT, credit card or cheque. Credit card payments will not be accepted by email or fax and must be made via our secure credit card gateway.

REGISTER ONLINE via our secure server at www.iired.com.au/gasturbine

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Event Code

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