

Understanding failure analysis investigation

7 October 2014 (Leatherhead)

Failures can be extremely expensive and damaging to business. Thorough analysis of a failure using the best practices available, is, therefore, paramount to damage limitation, to prevent a re-occurrence or to establish responsibility by identifying a root cause. This course describes various types of failures ranging from the failure of metallic and electronic components to failures in plastics and gas turbines. It outlines the techniques that can be used to carry out analysis and provides advice on how to maximise the benefits that come from these processes. A demonstration of scanning electron microscopy offers an informative insight into how failure analysis is carried out.

Your Programme

08.45 Registration and refreshments

09.00 **Understanding failure analysis**
- Reasons for undertaking failure analysis
- Benefits for parties such as loss adjusters, plant operators, designers and asset managers
- How engineering components fail with hands-on examples
- Importance of root cause analysis
- Discussion on how to maximise benefits.

09.25 **Failure investigation techniques - structured approach to failure analysis**
- The elements that can make up the investigation
- Tools available to the investigator
- Theoretical techniques that can be used to support the investigation.

10.00 Refreshments

10.15 **Group exercise based around investigating a number of different failure situations**

10.30 **Failures of metallic components**
- Approach to the investigation
- Use of metallurgical techniques
- Examples of failures.

11.15 **Failures of polymeric components – common causes of failures in plastics and the methods of investigation**
- Mechanical loads, fatigue, creep and moulding stresses
- Oxidation due to heat and light
- Environmental stress cracking - the most common cause of unexpected failure in plastics.

12.00 Lunch

Demonstration of scanning electron microscopy

Feedback on group exercise

13.30 **Electrical power systems failures - how simple physics can help explain electrical failure - illustrated by real cases**
- Electromagnetics
- Electrostatics
- Electrical arcs - low current and high current
- Partial discharge - tracking and erosion
- Electrical transients - vacuum circuit breakers.

14.30 Refreshments

14.45 **Failures of electronic components**
- How forensic engineering can help
- The impact of failures due to electronic components including physical examples of failures
- Case studies highlighting how failure analysis is used to diagnose problems and inform business decisions
- A structured process to analysis.

15.30 **Gas turbine failure**
- Failure modes
- Consequences of failure
- Examples of gas turbine failure.

16.15 Conclusions and questions

16.30 Close.

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Your Speakers



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Siavash Pahlavanyali
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Dr. Mike Wood
Gas Turbine Consultant
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I wish to make a firm booking for:

Understanding failure analysis investigation

☐ 7 October 2014

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