



# 2022 Metallurgical Failure Investigation

A magnifying glass with a black handle and frame is positioned over a grayscale micrograph of a metal surface. The micrograph shows a complex, irregular fracture pattern with various textures and shades of gray, suggesting a detailed metallurgical investigation. The magnifying glass is tilted, focusing on the central part of the fracture.

Nigel Brewitt &  
Dr Andrew Spowage

A three-day course involving lectures, classroom and group discussions, practical sessions and case studies specially designed for new and practicing engineers, materials engineers, maintenance engineers, integrity engineers, asset integrity engineers and engineers from other fields in acquiring knowledge of preparing and executing a failure investigation whether it be on-site or in the laboratory

## OBJECTIVES

The course aims to give an overall view of failure investigation techniques and procedures. Although based on metallic materials, the course covers examples and experiences from oil and gas, marine power, aerospace and railways.

## LEARNING OUTCOME

The students will gain knowledge of preparing and executing a failure investigation whether it be on-site or in the laboratory. Lectures given in the various failure modes will enable the student to understand the appearance of failed components in terms of their fracture surfaces both optically and electron optically. Through both lectures and practical sessions the student will be able to plan the extraction of samples and carry out metallographic preparation and replication.

## COURSE CONTENTS

- The methodology of carrying out a practical failure investigation
- Making observations, extracting preliminary data and collecting samples.
- On-site metallography and replication
- Understanding fracture modes and mechanisms.
- Understanding corrosion.
- Methods of root cause analysis.
- Practical sessions, exercises and case studies

## TARGET AUDIENCE

Engineers from all industries particularly oil & gas, power generation (including nuclear), aerospace and railways; material scientists and engineers, project engineers and asset integrity engineers. Senior managers and project managers are also welcome in order to understand the importance and practicalities of failure investigations.



**PRE-REQUISITES:** Diploma/Degree or Equivalent

**DURATION:** 3 Days

**CERTIFICATE:** Certificate of Attendance

**FEE:** RM3499 per person

**VENUE:** TBA

**LANGUAGE:** English

**DATES:** 25-27 Jan, 22-24 Feb, 22-24 Mar, 26-28 Apr, 24-26 May, 21-23 Jun, 26-28 Jul, 16-18 Aug, 27-29 Sep, 26-28 Oct, 1-3 Nov 2022

SWEC Code 18111500S - Safety, Survival & Specialised Skills Training & Consultancy



**JOTAC Academy Sdn Bhd,**

2 Jalan TPP 5/17, Taman Perindustrian Puchong, Seksyen 5, 47160 Puchong, Selangor Darul Ehsan



**Eur. Ing. Nigel Brewitt  
MMet, CEng, FIMMM,  
FIMM**

Nigel graduated from The University of Sheffield with a Masters Degree in advanced physical metallurgy and from Derby University with a post-

graduate diploma in corrosion science and technology. He worked in the welding and fabrication industry for 10 years before joining Rolls-Royce where he spent 20 years in the nuclear submarine division and a further 3 years in the aero-engine division as a metallurgist/ failure investigator. This also included working offshore on titanium heat exchangers in the North Sea for six years. Since retirement from RR, he has worked on a broad range of projects for Intertek Services Ltd in the UK as a failure investigator mainly on aerospace and railway track components. He is a director of MTIS Sdn. Bhd and a materials consultant for Norimax Sdn. Bhd where he has worked mainly on offshore component failures. Nigel is also a part-time lecturer at Nottingham University Malaysia Campus giving advice on industrial design and manufacturing.

He is a European Engineer, a Chartered Engineer, a Fellow of the Institute of Materials Minerals and Mining, a Fellow of the Institute of Materials Malaysia and was made honorary Associate Professor at the University of Nottingham Malaysia Campus. He is also on the industrial advisory panels for UTAR, TARUC and Nottingham Universities.



**Dr Andrew Spowage CEng, CSci,  
FIMMM, FIMM, PGCHE, CSSBB**

Dr Andrew holds the position of Senior Lecturer (Associate Prof) within the School of Engineering and Materials Science at Queen Mary University of

London. His areas of expertise range from the performance of materials, materials selection, corrosion and failure of materials. Before joining QMUL Andrew held the post of APAC Engineering Manager Wood PLC where he ran the materials, corrosion and integrity management teams. Andrew has also held the post of Head of Department of Mechanical Materials and Manufacturing Engineering at The University of Nottingham's Malaysia Campus and has been a materials specialist consultant for MTIS Sdn. Bhd. Since 2009. Dr Andrew holds a Post Graduate Certificate in Higher Education (PGCHE), is a Chartered Engineer, (CEng) a Chartered Scientist (CEng) and is a fellow of IOM3, IMM and HEA.

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## REGISTRATION FORM

Please send the completed form to [admin@jotac.com.my](mailto:admin@jotac.com.my) or WhatsApp no.: (011) 6356.0336. Thank you.

Name of Course: \_\_\_\_\_ Date of Course: \_\_\_\_\_

Name/s of Participant: 1. \_\_\_\_\_ 2. \_\_\_\_\_

3. \_\_\_\_\_ 4. \_\_\_\_\_

Name of Company: \_\_\_\_\_ Location: \_\_\_\_\_

Email Address: \_\_\_\_\_ Mobile No: \_\_\_\_\_

### PAYMENT DETAILS

Please make payment to **JOTAC ACADEMY SDN BHD**

Bank: Maybank

Account No.: 5127-1811-6603