Training Title

METALLURGICAL FAILURE ANALYSIS & PREVENTION

Training Duration

5 days

Training Date

REF WC045	Metallurgical Failure Analysis & Prevention	5	16-20 September 2024	$6,500	London, UK.

In any of the 4 or 5 star hotels. The exact venue will be informed once finalized.

Training Fees

- **$6,500 per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Lunch.**

Training Certificate

Define Management Consultancy & Training Certificate of course completion will be issued to all attendees.

Language: English

TRAINING OVERVIEW

TRAINING DESCRIPTION

This training course is designed to give a semi-detailed discussion of Metallurgical failure analysis in order for the course material to suit participants with or without a metallurgical background. The course is divided into three main areas: Analysis methodologies and investigation techniques, Failure modes and mechanisms and Failures involved in different engineering parts. In addition, several case studies are explained to the audience and discussion of case studies which might have been encountered by some of the participants.

TRAINING OBJECTIVES

- **To familiarize participants with the main tools and equipment used for metallurgical failure analysis.**
- **To introduce participants to different types of failures.**
- **To explain to participants the relationship(s) between design aspects, loading and/or manufacturing techniques and the different types of failures.**
- **To train participants to carry out a systematic failure analysis of filed parts.**
- **To describe and enhance necessary skills needed for successful failure analysis.**
- **To help the participants prevent future failures by proper inspection and our operation practice.**

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- **To train participants how to prepare a failure analysis report.**

WHO SHOULD ATTEND

Design engineers, process engineers, manufacturing engineers, product development engineers and managers, mechanical engineers with or without experience in metallurgy / failure analysis. Others who may benefit from this training course are commercial liability insurance underwriters and claims adjusters and trial lawyers specializing in product liability cases.

COURSE OUTLINE

General procedures for failure analysis

- **Collection of data and samples**
- **Macroscopic and microscopic examination**
- **Preparation and examination of metallographic sections**
- **Fractography**

Types of failure and stress

- **Fracture, wear, fatigue**
- **High temperature failures**

Ductile and Brittle Fracture

- **Dimple rupture**
- **Ductile-Brittle transition**
- **Intergranular fracture**

Fatigue failures

- **Factors affecting & stages of fatigue fracture.**
- **Effect of loading variables**
- **High temperature fatigue**

Wear failures

- **Abrasive & adhesive wear**
- **Lubricated and non-lubricated failures**
- **Wear examination**

Corrosion failures

- **Electro-chemical reactions**
- **Corrosive environments**
- **Analysis of corrosion failures**

Elevated temperature failures

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- **Creep, stress rupture, thermal fatigue**
- **Effect of environment**
- **Testing techniques and evaluation**

Examples and case studies of failures encountered in engineering parts and materials.

- **Failures of Cast part, welded parts, tools and dies, gears and gear-tooth, shafts and bearings, boilers and heat exchangers, pressure vessels.**

NOTE:

Pre & Post Tests will be conducted.

Case Studies, Group Exercises, Group Discussions, Last Day Review & Assessments will be carried out.

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