



European Technology Development

Option of attending:

In person or via Video Conference

LMF3 - Two Day Training Course

**Damage, Defect and Crack Assessment under
Creep and Fatigue Conditions**

Dates

24 – 25 February 2014

To be repeated on:

23 – 24 June 2014

Course Venue: European Technology Development Ltd
Fountain House, Cleeve Road, Leatherhead, Surrey, KT22 7LX, UK
(Just south of London)

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*For Registration Form, Course Fee and hotel details in Leatherhead
or central London please see the flyer 'LMF-Courses Brief' at the ETD website.*

Day 1

Module 1: Continuum Damage Mechanics

9.30 - 12.30h
(with coffee break)

Objectives

There are a number of models for the development of damage in structures. In this module, the main damage models are critically examined relative to their ability to accurately predict component behaviour and the underlying micro-mechanisms are also discussed.

Including:

- Damage Micro-Mechanisms
- How Damage Develops
- Damage Models: Kachanov-Rabotnov, etc.

Lunch Break

12.30 -1330h

Module 2: Fracture Mechanics Concepts

13.30 - 17.30h
(with coffee break)

Objectives

Basic elastic fracture concepts will be presented, then expanded to encompass complex loading situations and material property considerations. This will be later be developed to include elastic/plastic, fully plastic and creep concepts.

Including:

- Fracture theory
- Material influences
- Elastic/plastic fracture mechanics models
- Fully plastic and creep fracture mechanics concepts

Day 2

Module 3: Creep and Creep/Fatigue Crack Growth

9.30 - 12.30h
(with coffee break)

Objectives

High temperature crack growth is a complex phenomenon, determining the behaviour of a component containing a crack or defect at a given time is dependent on the interpretation of numerous material and loading parameters and their interactions. In this module both the underlying principles and the influencing parameters will be examined, as any component or defect assessment requires reliable input data such as operation, inspection and material data. The use of sensitivity analysis and the probabilistic approach to defect assessment is essential to reliably predict the plant integrity by taking into account uncertainty in the input data and variability in material properties.

Including:

- Creep Crack Growth Models
- Determination of Materials parameters
- Creep/Fatigue Interaction Models
- Introduction to Sensitivity Analysis and the Probabilistic Approach

Lunch Break

12.30 -13.30h

Module 4: Defect Assessment Procedures

13.30 – 17.00h
(with coffee break)

Objectives

The final part of the course aims to bring the foregoing theory into practice. After briefly reviewing and comparing the various codes, a general approach to defect assessment will be presented and then applied to specific case studies.

Including:

Defect Assessment procedures

- UK BS7910 (R6 and R5)
- French A16
- API 579
- HIDA Procedure and the HIDA KBS

Workshop

- Assessment of a cracked pipe under creep conditions
- Assessment of a cracked pipe under creep & fatigue conditions