



## 2-Days Online Training Course (Presented from London)

ETD's Life Management Foundation (LMF) Courses

Dates: 4 – 5 July 2023

# LMF3: Damage, Defect and Crack Assessment under Creep and Fatigue Conditions

LMF3  
COURSE

This 2-days course will run for 3.5 hours each day with 30 minutes optional Discussion Session at the end of each day. During the Discussion Session attendees can put their videos and microphones on and speak to the Course Presenter or to each other to exchange their experience. This way the course can be as close to the in-person event as possible!

The Course would emphasise the current and latest understanding, supported by *notes* and *references* for further reading and will be accompanied by *Worked Examples*.

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### ABOUT THE ORGANISER

#### European Technology Development Ltd. (ETD), UK

ETD is a UK based engineering and consulting company specialising in life assessment/extension, maintenance, materials and engineering issues in all types of power generating and process plant. In addition to its **main business of technical consulting, plant inspection and their condition and life assessment**, ETD regularly organises training courses in power, petrochemical, oil, gas and other industrial sectors as a part of its programme on **technology transfer to industry worldwide**. In the recent past ETD has organised various international workshops/ courses/ conferences in the UK, a number of other European countries (Germany, France, Portugal), Middle East, Far East, South East Asia, Canada and the USA. The issues involved in these courses covered lifing and failure analysis; HRSG design, maintenance and inspection; plant life assessment/ extension; high temperature plant materials behaviour; plant component safety and durability; performance of in-service welds and weld repairs; power plant cycling - technical and cost issues; boiler and turbine maintenance; petrochemical and refining plant issues; and, power plant benchmarking for performance, and risk based maintenance and inspection (RBMI).

For further information,

Please visit: [www.etd-consulting.com](http://www.etd-consulting.com) Or, write to: [enquiries@etd-consulting.com](mailto:enquiries@etd-consulting.com)



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ALL SHOWN TIMES ARE LONDON / UK TIMES

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You will be sent the Zoom link a few days before the start of the course.

Please join at 0745h to introduce yourself and to make sure that you don't miss the start in case of any last-minute connection problems. Please write to [enquiries@etd-consulting.com](mailto:enquiries@etd-consulting.com) in case of problems.

**DAY 1** - Tuesday 4<sup>th</sup> July 2023 (08:00 – 12:00h)

**Module 1: Fracture Mechanics Concepts**

(08:00 – 09:30h)

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

**Specific Topics**

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

Break = 09:30 – 1000h

**Module 2: Creep & Creep / Fatigue Crack Growth**

(10:00 – 11:30h)

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.

**Specific Topics**

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

Optional DISCUSSION SESSION 11:30 to 12:00h

**DAY 2** - Wednesday 5<sup>th</sup> July 2023 (08:00-12:00h)

Please join at 0745h to make sure that you don't miss the start in case of any last-minute connection problems. Please write to [enquiries@etd-consulting.com](mailto:enquiries@etd-consulting.com) in case of problems.

**Module 3: Defect Assessment Procedures**

(08:00 – 09:30h)

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 & R5)

French A16; API 579

ETD's Crackfit

**Specific Topics**

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

Break = 09:30 – 1000h

**Module 4: Worked Examples**

(10:00 – 11:30h)

Optional DISCUSSION SESSION 11:30 to 12:00h

**REGISTRATION FORM (Please email)**

Online Training Course

**LMF3: Damage, Defect & Crack Assessment**

**Dates: 4 – 5 July 2023**

**Registration Fee:** Covers delivery of the course & provision of presentations in pdf format (all fees shown are in GB Pounds). Please put 'x' in the relevant box and show the total payment.

<b>Reduced Fee</b> (Until 1 June 2023)		<b>Full Fee</b> (From 2 June 2023)	
£400		£450	
Please show here (no. of attendees x £ ): <b>Total Amount Payable = £</b>			

**How to Pay:** When paying please quote reference 'LMF3 Course- July.2023' and the ETD invoice number (if this was issued):

**1) By bank to bank transfer to:** European Technology Development Ltd.  
(ETD bank account details will be provided on registration)

**2) Credit Cards:** Payment information will be provided on registration.

**When registering, please state here how you paid or intend to pay:** .....

All Registration & Payment enquiries to: [enquiries@etd-consulting.com](mailto:enquiries@etd-consulting.com)

**Attendee(s) Details**

Your **title** and **name:**

Company:

Job Title (optional):

Address:

Phone:

E-mail:

**Address for Registration:**

Please email the required information/completed form to:

[enquiries@etd-consulting.com](mailto:enquiries@etd-consulting.com) Telephone enquiries: +44 1372 363111