



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

*ETD's Life Management Foundation (LMF) Courses*

**Dates: 13 – 14 June 2023**

# **LMF2: Understanding of Welds and Welded Component Behaviour in High Temperature Plant**

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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**DAY 1** - Tuesday 13th June 2023 (08:00 – 12:00h)

**Module 1: Introduction to Component Failure**

(08:00 – 09:30h)

This module will start with the introduction of global deterioration of plant components operating under creep and / or creep-fatigue conditions. It will then discuss crack initiation in components with and without pre-existing defects. This will be followed by the discussion of creep crack growth and failure criteria. Finally an overview of the general approach for defect assessment will be given.

**Specific Topics**

- Global Deterioration
- Crack Initiation
- Crack Growth
- Failure Criteria
- Component Assessment Methodologies

Break = 09:30 – 1000h

**Module 2: Understanding Welds**

(10:00 – 11:30h)

The joining of components and parts of components by welding is a fundamental element to component fabrication and plant construction. The complexity of weld structures will be examined both from design and fabrication perspective and most influential factors such as welding procedures, weld microstructure, heat affected zone etc. will be discussed.

**Specific Topics**

- Metallurgy of Welds
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- Material Properties Variations
- Defects in Welds
- Service Experience – Weld Cracking

Optional DISCUSSION SESSION 11:30 to 12:00h

**DAY 2** - Wednesday 14<sup>th</sup> June 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.

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COURSE

### Module 3: Assessment of Welded Components

(08:00 – 09:30h)

Service experience shows that most problems / failures in power plant components are associated with welds. Hence this module will focus on understanding the factors that influence weld performance and adversely affect the remaining life of welded components. Emphasis will be put on the assessment of defective welds including inspection.

#### **Specific Topics**

- Creep and Fatigue at Welds
- Service Experience
- Inspection Aspects

Break = 09:30 – 10:00h

### Module 4: Life Assessment Workshop

(10:00 – 11:30h)

The aim of this workshop is to introduce a general approach for assessing welded/complex components. The application of this approach will be illustrated through solving practical plant problems. Sensitivity analysis on input data, particularly the variation in material properties of the various weldment constituents, will be carried out to highlight the level of their influence on life assessment.

#### **Specific Topics**

- Assessment of welded components in a high-temperature Piping System

Optional DISCUSSION SESSION 11:30 to 12:00h

**REGISTRATION FORM** (Please email)

Online Training Course

**LMF2: Understanding of Welds and Welded  
Component Behaviour in High Temperature Plant**

**Dates: 13 – 14 June 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 10 May 2023)	<b>Full Fee</b> (From 11 May 2023)
£400	£450
Please show here (no. of attendees x £ ): <b>Total Amount Payable = £</b>	

**How to Pay:** When paying please quote reference ‘LMF2 Course- June.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