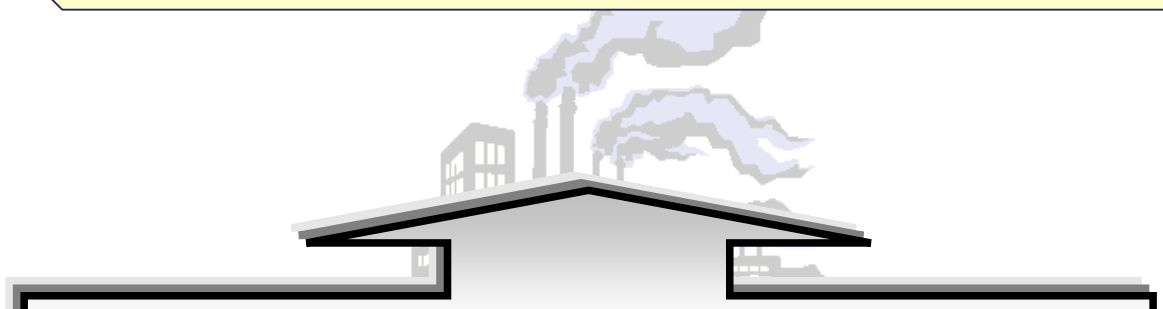
'New High Temp. Materials' Seminar

aimed at industry exchange of experience

Use of P91, P92 & P23, P24 and Other Steels *in* Thick and Thin Section Boiler/ HRSG Components

New Findings on material fabrication, welding, operation, failure, weld repair & integrity / life assessment



***Note**: This Seminar will be preceded by an optional 2-day **P91 Course** (20-21June). Furthermore, it will be followed by an optional 1-day **P23 Course** (23 June); all at the same venue.*

To see further information and Programme details please visit: www.etd1.co.uk

Provisional Programme & Registration Form

Venue: Institute of Materials (IOM), London www.iom3.org

Date: 22nd June 2011

Organised by: ***European Technology Development, UK***

Why This Seminar?

The pace of change in power plant sector has never been faster with a continuing move from the low alloy materials to higher strength higher alloy materials that can withstand higher temperatures and pressures. All of this in an effort to increase output, efficiency and flexibility and reduce pollution and associated penalties. The new high strength materials such as the now ubiquitous higher Cr martensitic steels have another particular benefit in that due to their higher creep strength components can be manufactured in *smaller wall thickness* thus saving time and costs in manufacturing, welding, transportation, erection etc. The smaller wall thickness also means that the adverse thermal fatigue effect due to *plant cycling*, now becoming a common mode of operation worldwide, will be less. However, the *drawback* can be the relative sensitivity of these steels to heat treatment details during steel production and component manufacture. This includes ***forming/bending or welding***, the criticality of ***cooling rate***, ***pre- and post-weld heat treatment*** and the resulting ***micro-structural details.***

The other factors that need special consideration are ***component monitoring and integrity/ life assessment at the mid-life stage***. The last factor can be particularly problematic as cavitation in these steels, which has been successfully used in the low alloy steels for creep ***life exhaustion studies***, appears late in life and therefore new concepts/ technologies/ techniques are required to enable plant operators to predict damage/ failure and make 'run, repair or replace' decisions. Similarly a number of research studies have shown that ***steam side oxidation*** of these new steels may not be as good as expected of higher Cr steels. This has implications on the use of thin wall boiler tubing for superheaters made from these high strength steels.

Unlike most other 'research' conferences this 'New Materials Seminar' will be aimed at industry. The aim is to bring together industry engineers and researchers from around the world and to discuss successful fabrication, use and integrity assessment of these steels. Participation by the alloy producers, plant operators, manufacturers, service providers and researchers is expected *from USA, Canada, Europe, Japan, and elsewhere.*

*The **Feedback** from an earlier seminar on this issue (organised by ETD in London) speaks volumes for the usefulness of these industry and research Seminars. (please see separate box).*

Who Should Attend?

- *Plant managers, operators and maintenance engineers* of the HRSG/power plant using P/T 91 or intending/planning to use this material.
- *Plant manufacturers and alloy producers* who should be aware of the pitfalls and unsatisfactory practices and who wish to exchange experience.
- All those *involved in P/T 91component damage/ cracking assessment* and wishing to know its behaviour in plant.
- Engineers from *service providing / consulting companies.*
- *Inspection* personnel seeking an appreciation of the problems and damage/ cracking behaviour of high temperature components using P/T 91 material.
- *Planning personnel* seeking a better understanding of the issues involved with the integrity of P/T91 components and required replacement / repair strategies.
- *Researchers* involved in developing P/T91 component integrity, life and crack assessment strategies and methodologies who need to know the industry experience, concerns and needs.

TYPICAL INTERNATIONAL FEEDBACK
FOR THE PREVIOUS SEMINARS HELD IN LONDON

1) Thank you for an excellent week's schedule of papers on T/P91, 92 and 23. It was a most useful and informative week, not only in the papers presented but in the exchange of views and experience ….

D Anderson, Technical Authority & Section Manager-Boiler Mech. Design, Doosan Babcock Energy, ***UK***

2) Congratulations …… for the high quality technical Seminar you organized last week in London. I appreciated the presentations of all the speakers.

Dr Eng Leonardo Cipolla, Centro Sviluppo Materiali (CSM), ***Italy***

3) I want to thank ETD team for the organisation of the Seminar. It was a good occasion to hear and to discuss the potential of new materials ...and the "on-site reality".

Patrick Billard, Electricite de France, ***France***

4) I would like to thank ETD organizers for the wonderful seminar and courses that were presented last week. They were very informative and I learnt a lot.

Mahnaz Missaghi, Sask Power, ***Canada***

5) Thank you once again for a very informative seminar and course.

Rick Bingham, MPR Associates, ***USA***

6) I think both the seminar and course were extremely successful, thank you very much for organising these.

Dr Huijun Li, Australian Nuclear Science and Technology Organisation (ANSTO), ***Australia***

7) Many thanks for the course, seminar and the ability to sit in on the P91 Users Group meeting. The week spent with Dr Shibli, Dr Robertson and colleagues on the course was most enlightening

Mike Pearson, Mechanical Engineer / Equipment Inspector, Genesis Energy, ***New Zealand***

What Do You Get ?

This is the 6th Seminar in the series being held in London. It is primarily 'aimed at industry' and is largely devoted to the understanding of issues involved in the practical use of P/T91, P/T92 and P/T23 based on plant experience and predictions made by the leading researchers. The previous four seminars were held in London.

Plant operators, manufacturers (including welding companies and welding consumable manufacturers) and service providers will be encouraged to raise/ discuss problems from their personal/company experience during the seminar.

The participants will also get the *Seminar notes/ presentations* on a CD.

Who Are We ?

European Technology Development (ETD) is a UK based engineering advisory, consulting and R&D company specialising in high temperature plant life assessment/extension, maintenance, materials and engineering issues in all type of power generating and petrochemical/process plant. ETD has, in the recent past, organised various international workshops/ courses/ conferences in Europe, USA, Canada and Asia mainly on the issues such as: industrial plant life assessment/extension, high temperature plant materials, plant component safety and durability, performance of in-service welds, power plant cycling, risk based maintenance (RBM), probabilistic assessment, weld repairs, HRSGs, high temperature materials behaviour etc. The company is leading and co-ordinating a number of large leading edge international industry initiatives on issues related to the assessment and improvement of high temperature plant performance, materials, design, plant maintenance and inspection strategies. Further information about ETD, its projects, life assessment courses offered and other activities can be seen at:
www.etd1.co.uk

SEMINAR PROGRAMME

USE OF P91, P92, P23 & P24 STEELS

Registration: *0830- 0855 h*

Welcome & Introduction: *0855 – 0900h*

(Presentations = 25 minutes + 5 minutes discussion)

Session 1: **New Developments, Welding and Weld Performance**

(0900 – 1100h)

1. **Development of Filler Metal for the New Cr-Mo Heat Resistant Alloy C(F)B2**
   *Zhuyao Zhou, Metrode, **UK***

2. **Welding Issues and A1 Transformation Behaviour in CSEF Steels**
   *F Masuyama, Kyushu Institute of Technology, Ex-MHI, **Japan***

3. **Performance of P91 Welds in Cycling Power Plant**
   *C Smith, A Shibli, European Technology Development, Surrey, **UK***

4. **9Cr3W3Co With Boron Addition - A Candidate Steel For Advanced USC Plants: Its Fabrication and Welding Issues**
   *Peter Mayr, Head Welding Department, Chemnitz University of Technology, **Germany***

Break (1100 – 1130 h)

Session 2: **Plant Experience** *(1130 – 1300h)*

1. **Use of P91 - Plant Experience and Lessons Learnt**
   D Robertson, European Technology Development, Surrey, ***UK***

2. **T91 Steam Oxidation and Plant Demonstration of Aluminised T91 Tubes**
   J Hickey, S Scully, Electricity Supply Board, Dublin, ***Ireland***
   A Shibli, European Technology Development, Surrey, ***UK***

Attendees' Experience and Discussion

Half an hour of discussion and opportunity for participants' brief contributions (~ 5 minutes each - including a few slides if necessary) from their own experience. *A number of manufacturers and utilities are expected to talk about their experience.*

Lunch Break *1300 – 1400 h*

Session 3: **Integrity and Life Assessment Issues** *(1400 – 1630h)*

1. **Development of Hardness Model for P91/P92 Creep Life Assessment**
   F Masuyama, Kyushu Institute of Technology, ***Japan***

2. **A New Approach for Creep Life Prediction of Grade 23 and 24 Steels**
   Mark Whittaker, B Wilshire, University of Swansea, ***UK***

3. **New Tools for Plant Inspection and On-Site Condition/ Life Assessment - With Special Reference to P91**
   A Shibli, European Technology Development, Surrey, ***UK***

4. **Component Lifetime Evaluation Based on Long Term Behaviour of 9 Cr Steels and Weldments**
   Andreas Klenk, Karl Maile, MPA Stuttgart, ***Germany***

Discussion of Life Assessment Issues *(30 minutes)*
Participating utilities and service providers will be encouraged to talk about their own problems with P91 integrity and life assessment.

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REGISTRATION FORM *(Please copy and e-mail / fax / post)*

P91 Course + New Materials Seminar + P23 Course

Venue: IOM3, London www.iom3.org *20 – 23 June 2011*

REGISTRATION FEE *(Please feel free to register for any one or more events)***:**

Please show at the bottom of the table below the Events that you re attending and the total fee that you are paying. The fees below are shown in **pound sterling** and include 20% UK Value Added Tax (VAT) which all delegates need to pay for events held in UK.

Event	Reduced Fee (until 18th May11)	Full Fee (from 19th May11)
2-days (20-21 June) ***P91 Course***	750 +150(VAT) = **£ 900**	800 +160(VAT) = **£ 960**
1-day (22 June) **Seminar**	190 + 38(VAT) = **£228**	210 + 42(VAT) = **£252**
1-day (23 June) ***P23 Course***	375+75(VAT) = **£ 450**	410+82(VAT) = **£ 492**
Attending Events =		
Total fee = £	minus 10 reduction* *(if applicable)* = **£**	

* ***Note:*** 10% reduction in fee for those attending more than one event. 10% reduction in fee for more than two attendees from same organisation. Only one reduction will apply in any one case.

PAYMENT: By UK bank cheque, bankers draft, or bank to bank transfer to 'ETD Ltd.' (For payment by bank to bank transfer, account details will be supplied on request. For account details please contact Mrs K Mahoney kmahoney@etd1.co.uk *Please quote reference* ***'June 10 TC & Seminar'*** *with the payment and state how you paid/ intend to pay*

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By Credit Card: Major cards such as Visa/ Master Card/ JCB/ American Express/ Switch are accepted with the exception of Dinners Club. For security please *fax* or post this information.

Name of Account Holder		Expiry date	
Card Type and No.		Security no	
Authorisation signature			

Accommodation: Information on hotel booking, with special concession, will be provided on request. In central London this could be in the region of £100 per day.

Delegate Details: (Required for your badge)

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

Company: Position:

Address:

Phone: Fax: E-mail:

REGISTRATION ADDRESS: Please copy and post/ fax/ e-mail to address below:

Registration Section, European Technology Development, 6 Axis Centre, Cleeve Road, Leatherhead, Surrey KT22 7RD, UK

Enquires re registration & accommodation: Mrs Kay Mahoney: kmahoney@etd1.co.uk

Tel: + 44 (0) 1372 363 111 or + 44(0)1372 363 112 Fax: + 44 (0) 1372 363 222

Venue: www.iom3.org