

1-day 'New High Temp. Materials' Seminar cum Workshop
aimed at *industry exchange of experience*

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



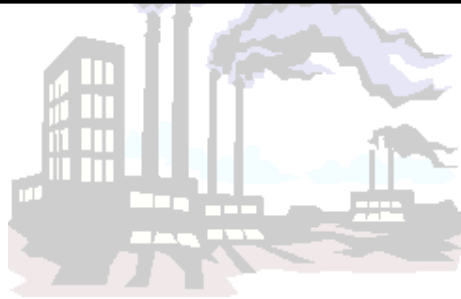
*Fabrication, welding, operation, failure, weld repair &
integrity / life assessment issues*



This 1-day seminar & on the use of new steels (P91, P92, P122, P23) in high temperature plant (10 Nov) will be run back-to-back (at the same venue) with the following **Optional** courses (you can attend one or more events):

- 1) 2-day Training Course P91/T91 (8-9 Nov)
- 2) 1-day Training Course on Life Assessment & Damage Mechanisms (11 Nov)
- 3) 1-day Training Course on Crack Assessment & Fitness for Service (12 Nov)

>> To see further information and programme details please visit: www.etc1.co.uk



Seminar Programme

Venue: Bali Hyatt Sanur, **BALI**, Indonesia

Date: **10 NOVEMBER 2010**

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 91 component 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 ETD organised industry oriented Seminar largely devoted to the understanding of the issues involved in the practical use of P/T91, P/T92, P122 and P/T23 based on plant experience and predictions made by the leading researchers.

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.

European Technology Development Ltd. (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 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 etc. The company is leading and co-ordinating a number of large leading edge international industry initiatives (supported by the industry from North America, Japan, Europe and elsewhere or by government organisations such as the European Commission) on issues related to the assessment and improvement of high temperature plant performance, materials and design, and maintenance and inspection strategies. The company has carried out/ participated in leading edge projects on P91 weld repairs, crack assessment, integrity issues and has carried out studies of P/T91 performance in plant worldwide. Further information about ETD, its projects, life assessment courses offered and other activities can be seen at: www.ETD1.co.uk
www.ommi.co.uk



SEMINAR / WORKSHOP PROGRAMME

USE OF P91, P92 & P23 STEELS

(The programme brief is shown below. Full programme with the titles of presentations and speaker details will be published in early 2010)

(Presentations) = 30 minutes + 5 minutes discussion)

Morning

(0830 – 1230 hrs)

Three papers, one on design and construction, one on quality control and one on welding of P91 and P23.

30 minutes break

Two papers, one on thick section component cracking/ failure and one on tubing failure due to steam side oxidation.

Followed by 35 minutes discussion on Plant experience and the participants' brief (5-10 minutes) contributions from their own experience.

Lunch

1230 – 1330 hrs

Afternoon

(1330 – 1600 hrs)

Three papers (two on life assessment issues and one on more recent R&D findings).

This will be followed by a discussion by the participants for 45 minutes.

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

**New High Temp. Materials Seminar (10 Nov) + P91 Training Course (8-9 Nov)
+ Life Assessment & Damage Mechanisms Training Course (11 Nov) + Crack
Assessment & FFS Training Course (12 Nov) - Bali Hyatt Sanur, Bali**

REGISTRATION FEE *:

➔ Please circle in the table below the amount relevant to you. The fee will be charged in pound sterling. For general guidance the conversion rate on 1st January 2010 was: £1 = US\$1.50. *Please feel free to register for one or more events.*

	Reduced Fee (until 1 st October 10)	Full Fee (from 2 nd October 10)
<i>Seminar: New High Temperature Materials (10 Nov. 2010)</i>	£200	£225
<i>Course: P/T91 Advanced Steel (8-9 Nov. 2010)</i>	£700	£750
<i>Course: Plant Life Assessment & Damage Mechanisms (11 Nov. 2010)</i>	£400	£450
<i>Course: Crack Assessment & Fitness-for-Service (FFS) (12 Nov. 2010)</i>	£400	£450

* **Note:** 20% discount for attending any 3 or more events or for group booking of 3 or more attendees from the same organisation.

PAYMENT

By bankers draft, or bank to bank transfer to:

European Technology Development

(For payment by bank to bank transfer, account details will be supplied on request. Contact details are shown at the bottom of this form). *Please quote reference 'Bali Events 10' with the payment and state here how you paid or 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		Amount to pay	£ Sterling
Card Type and No.		Expiry date	
Authorisation signature		Security code	

Venue: Bali HYATT Sanur, Bali, Indonesia (www.Bali.Resort.Hyatt.com)

Accommodation: Information on local hotels can be acquired by email to: bali@matta-tour.com

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 for registration or accommodation: registration@etd1.co.uk

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