



'New High Temp. Materials' Seminar

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 international gathering of industry engineers and researchers will be preceded by a two-day **P91 Training Course** on 26-27 July 2010 and followed by a 1-day **P23 Training Course** on 29<sup>th</sup> July - all at the same venue

Seminar Programme

Venue & Accommodation: Marriott Westchase, Houston, Texas  
[Houston Marriott Westchase >>](#) \*

Date: **28 JULY 2010**

Organised by

**European Technology Development, UK**

Sponsored by



**Goodwin Industries(UK)**

\* **Accommodation:** Concessionary room rates for attendees are available until mid July. See Registration page for details.

## *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 6<sup>th</sup> 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.

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### **European Technology Development Ltd. (ETD)**

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.etc1.co.uk](http://www.etc1.co.uk)

### **Vogt Power (Sponsor)**

Vogt Power International Inc. is the premier HRSG manufacturer with unequalled experience in Combined Cycle and Cogeneration plants. VPI's extensive experience includes supplementary and auxiliary fired units, the supply of SCR and CO systems, and additional design features such as stack dampers, silencers, shrouds, and exhaust bypass systems. Our Aftermarket department specializes in inspections, studies, turnkey engineered retrofits, and field TA services for all OEM's HRSGs. [www.vogtpower.com](http://www.vogtpower.com)

### **Goodwin Industries (Sponsor)**

Goodwin, England – a foundry and engineering group established over 125 years ago in 1883. Employing over 400 people and specialising in large engineering components for power generation and structural applications. Goodwin have over 30 years experience in manufacturing steam valves and components from 250 to 50,000kg in CrMo, CrMoV and all variants of 9.5%Cr steels.

Currently Goodwin are manufacturing the structural cable band clamp castings for the new Bay Bridge in San Francisco. Supplying large finish machined, and assembled components to China, Japan, India, the USA as well as Europe, earned Goodwin the prestigious 'Queen's Award for International Trade'. Heavily involvement in research projects on 9.5%Cr and super-nickel alloys keep Goodwin at the forefront of product and material development. [www.goodwin.co.uk/gsc](http://www.goodwin.co.uk/gsc)

**SEMINAR / WORKSHOP PROGRAMME**  
**USE OF P91, P92 & P23 STEELS**

**BREAKFAST & REGISTRATION**

**0700 – 0830 HRS**

Presentations

Keynote = 30 minutes + 5 minutes discussion

Others: 20 minutes + 5 minutes discussion

**Morning Session**

**(0830 – 1230 hrs)**

***Keynote: Grade 91 Material: A Unique Steel with Unique Norms for Life Consumption Estimation***

*Akber Pasha, Vogt Power International, USA*

**Very Heavy Section 9Cr Martensitic Steel Castings for Ultra-Supercritical Applications and New Developments in 9Cr Variants**

*Stephen Roberts, Goodwin Steel Castings Ltd., UK*

**Issues Concerning Fabrication, Welding and Weld Performance of P23**

*Fujimitsu Masuyama, Kyushu Institute of Technology (ex-MHI), Japan*

**Welding and Weld Repair Issues in P91 Steel**

*David Robertson, European Technology Development, UK*

*Break: 1020- 1050 hrs*

**P91 Thick Section Component Cracking - Update and New Case Studies**

*Ahmed Shibli, European Technology Development, UK*

**Experience With the Welding of Grade 91 and Grade 92 with Matching Filler Metals**

*Herbert Heuser, Russel Fuchs, Bohler Welding Group, USA*

**Thick and Thin Section Component Issues: The Experience of International P91 Users Group**

*David Robertson, European Technology Development, UK*

**Developments in Welding Consumables for P91, P92, P23, P24 & CB2 (9Cr modified with B)**

*Zhuzao Zhang, Graham Marshall, Metrode, UK*

*Lunch*

*1230 – 1330 hrs*

**Keynote: Life Assessment Issues and Methodology for P91 and P92 Components**

*Fujimitsu Masuyama, Kyushu Institute of Technology (ex-Mitsubishi Heavy Industry), Japan*

**Update on the Development of New Techniques for P91 Early Stage Damage Detection**

*Ahmed Shibli, European Technology Development, UK*

**Phase Transformation Characteristics of P91 and P92, consideration in Welding Procedures and Creep Rupture Behaviour**

*Zhuzao Zhang, Graham Marshall, Metrode, UK*

**Development of Ni-based Alloys for the New Generation Ultra-supercritical Power Plant**

*Stephen Roberts, Goodwin Steel Castings Ltd., UK*

**Experience with Grade 23 and 24 Filler Metals, including a Novel Approach to Dissimilar CrMo Welds**

*Russel Fuchs, Bohler Welding Group, USA*

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**30 Minutes *Panel Discussion*:** Discussion and small ~5 minute presentations by the participants.

***THE END***

# REGISTRATION FORM

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

P91 Course + New Materials Seminar + P23 Course  
Houston, Texas, 26-28 July 2010

## REGISTRATION FEE:

➔ Please circle in the table below the amount relevant to you. **The fee will be charged in the equivalent pound sterling at the time of the payment.** For general guidance the conversion rate on 27 May 2010 was: £1 = \$1.45.

*Please feel free to register for one, two or all three events*

	Reduced Fee (until 14 <sup>th</sup> June 10)	Full Fee (from 15 June 10)
<b>P91 Training Course</b> 2-days (26-27 July)	900 (dollars)	1000 (dollars)
<b>Seminar</b> 1-day (28 July)	200 (dollars)	250 (dollars)
<b>P23 Training Course</b> (29 July)	450 (dollars)	500 (dollars)

## PAYMENT

**By UK bank cheque, 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 'Courses + Seminar, Houston 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	\$
Card Type and No.		Expiry date	
Authorisation signature		Security code	

**Venue + Accommodation:** [Houston Marriott Westchase >>](#) *Concessionary room rates for attendees are available until mid July. Please fill in your check-in / check-out dates on the home page and then click on the red box 'Check Availability'. The ETD Seminar/Courses code is already built in.*

**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, Cleve Road, Leatherhead, Surrey KT22 7RD, UK

Enquires for registration or accommodation: [registration@etd1.co.uk](mailto:registration@etd1.co.uk)

Tel: + 44 1372 363 111 or + 44 1372 363 112 Fax: + 44 1372 363 222