

International Conference

Fabrication and Use of P91 Steel:

International Industry & Plant Experience

Dates: 11 – 12 October 2017

Venue: Newcastle Exhibition & Convention Centre, 309 King Street, Newcastle West, New South Wales, 2302, Australia (www.thenex.com.au)

Preceded by a 2-day Course
(9-10 October 2017) on: **P91-P92 Issues**

Course Programme at:
www.etd-consulting.com

CONFERENCE PROGRAMME

The relatively new 9Cr martensitic steels P91 and P92 have helped to increase power plant temperatures, pressures and efficiency for the new generation of plants. They are also used as replacement components in older power plants where this has helped to increase plant flexibility and reduced component fabrication, replacement and related costs. However, these steels can only achieve their design strength if they are heat treated strictly to their specified heat treatment temperatures. As their high strength strictly depends on achieving ideal martensitic microstructure slight deviations from the specified temperatures, during manufacture, fabrication and welding can lead to disastrous consequences. Unfortunately, plant experience has shown that today P91 steel components are found in many power plants with various ‘aberrant’ or abnormal microstructures resulting in premature failures worldwide. Without long term creep strength data for these aberrant microstructures it is difficult to predict their safe operating life with any degree of certainty. The other factors that need special consideration are *component inspection, monitoring and integrity/ life assessment*. The last factor can be particularly problematic as micron size cavitation observed by traditional NDE tools in these steels, which has been successfully used in low alloy steels for creep *life exhaustion studies*, appears only late in life and therefore new concepts/ technologies/ techniques are required to enable plant operators to inspect early stage smaller size creep cavitation (nano or a few micron size), and predict damage/ failure and make ‘run, repair or replace’ decisions.

Luckily a number of industry initiatives are now underway to address these issues and these will be discussed in this conference. The **objective** is to bring together plant manufacturers, fabricators, operators, service providers and researchers on one platform and learn from plant and research experience to date.

Technical enquiries to:

Dr Ahmed Shibli ashibli@etd-consulting.com Tel: + 44 1372 363 111

Deadline for optional paper submission = 15th September 2017
(Submitted papers will be considered for the Special Issue of a Journal)

Conference Organizers



Sponsors & Associates



Day 1: Wednesday 11th October 2017

09:00 – 09:45h **Registration & Reception**

Welcome Address

09:45 – 09:50 Welcome by the Conference Chairman

09:50 – 10:00 Welcome by the Local Organising Committee

Presentation time: Keynote (35 minutes); Others (25 minutes); time includes ~3 mins Q&A

Session 1: High Cr Martensitic Steels Development & Type IV Cracking (10:00 – 12:30h)

10:00 - 10:45	(S1-1): <i>Plenary Paper</i> : Development history and new generation of creep strength enhanced ferritic steels	Fujimitsu Masuyama, Kyushu Institute of Technology, Japan
10:45 – 11:30	(S1-2): <i>Plenary Paper</i> : Development of new technologies and methodologies for the inspection, monitoring and life assessment of P91 and P92 steel components	Ahmed Shibli, ETD, UK
11:30 – 11:55	(S1-3): Aberrant P91 and life assessment issues	David Robertson, ETD, UK
12:00 – 12:30	Discussion	All

12:30 – 13:30h **Lunch Break**

Session 2(a): Fabrication & Welding (13:30 – 15:30h)

13:30 – 14:05	(S2-1): <i>Keynote</i> : Friction stir welding of 9-12%Cr creep resistant steels	Lei Cui, Tianjin University, China
14:05 – 14:30	(S2-2): Welding and weld repair issues in P91	David Robertson, ETD, UK
14:30 – 14:55	(S2-3): P91 welds from root to cap with TIP TIG	Charles W. "Pat" Patrick ALS Maverick Testing Labs, Inc., Texas, USA
14:55 – 15:20	(S2-4): P91 fabrication utilizing controlled dip transfer without utilizing a back purge	Logan Kucerak Kiewit Offshore Services Ingleside, Texas, USA

15:30 – 16:00h **Coffee Break**

Session 2(b): Fabrication & Welding (16:00 – 17:25h)

16:00 – 16:35	(S2-5): <i>Keynote</i>: Isothermal martensitic phase transformation at welding inter-pass temperature for P91 steel	Huijun Li, University of Wollongong, Australia
16:35 – 17:00	(S2-6): Additional considerations when welding P91 to Australian standards and ASME codes	Louise Petrick, Welding Technology Institute of Australia
17:00 – 17:25	(S2-7): How to control and conduct inspections on mill production material and fabrication of P91 and P92	Henryk Mazur, Mazur Energy, Poland

Group Photo Session: 1725 – 1745h

17:45h END OF DAY 1

Day 2: Thursday 12th October 2017

Session 3: Inspection, Life Assessment & Heat Treatment (09:00 – 10:35h)

09:00 – 09:35	(S3-1): <i>Keynote</i> : Development of Grade 91 high energy piping inspection programmes	Anita Zunker, PEI, New Plymouth, New Zealand
09:35 – 10:10	(S3-2): <i>Keynote</i> : Development of residual life diagnosis method by strain for 9%Cr steel welded steam piping	Hidetaka Nishida Chugoku Electric Power Co., Inc., Higashihiroshima, Japan
10:10 – 10:35	(S1-2): A new joint industry initiative for the change of heat treatment sequence when welding P91 to avoid Type IV failures (Project: WELDCREEP)	Ahmed Shibli, ETD, UK

10:35 – 11:05h **Coffee Break**

Session 4: P91 Component Cracking/ Failure & Repair (11:15 – 12:30h)

11:05 – 11:40	(S4-1): <i>Keynote</i> : Experience with P91 component cracking, failure and repair	Damien Charman, ALS, Australia
11:40 – 12:05	(S4-2): Innovative methods of reinforcing damaged high temperature steam piping	Kenta Funakoshi Chugoku Electric Power Co. Higashihiroshima, Japan
12:05 – 12:30	(S4-3): Creep of CMV to P91 weld with a P22 filler weld	Michael Drew, ANSTO, Australia

12:30 – 13:30h **Lunch Break**

Session 5: International Codes, Creep-Fatigue and Quality Assurance (13:30 – 15:20h)

13:30 – 14:05	(S5-1): <i>Keynote</i> : ASME Code specification issues and peak use temperature consideration of Grade 91 steel	Fujimitsu Masuyama, Kyushu Institute of Technology, Japan
14:05 – 14:30	(S5-2): An assessment of Creep-Fatigue cracks in a P91 heat exchanger test for a Sodium fast cooled reactor	Warwick Payten, ANSTO, Australia
14:30 – 14:55	(S5-3): <i>EDSE</i> : A new portable spark erosion 'boat sampling' device for quality assurance and life assessment	Ahmed Shibli, ETD, UK
14:55 – 15:20	(S5-4): Integrity analysis of P91 steel	Muhammad Turi, AMCO, Saudi Arabia

15:20 – 15:30h: **Closing Remarks**

15:30h END

'Fabrication & Use of P91 Steel' Conf., Newcastle, Australia (11–12 October 2017)
& 'P91-P92 Issues' Training Course (9 & 10 October 2017)

Registration Form (Please fax / email)

Registration Fee: * Please put 'X' in front of the box applicable to you and show the total payment at the bottom.

Fees to be paid in GB pound sterling

	Reduced Fee Until 11 th Sept 2017	*	Full Fee From 12 th Sept 2017	*
	Fee		Fee	
Conference Delegates	£300		£350	
Conference Presenters	£250		£300	
Training Course	£600		£650	
*Notes: 1) 10% reduction if attending more than one event. 2) 10% reduction if more than one delegate attending from the same organisation. 3) 20% reduction for students. ONLY ONE REDUCTION WILL APPLY Please show here the Total Amount Payable = £				

Conference Registration Fee covers the Proceedings, provided soon after the conference, coffee/tea, lunches, and Conference Reception on Day 1 (11th Oct. evening).

The Course Fee covers printed course notes supplied at the start of the Course, electronic (PDF) copies of the slides, coffee/ tea and lunches.

Payment Options

1) 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).

2) By UK bank cheque made payable to 'ETD Ltd.'
 Please quote reference '**P91 Conf. + Course Oct 17**' with the payment and state how you paid or intend to pay:.....

By WorldPay: Major cards such as Visa/ Master Card/ JCB/ American Express are accepted with the exception of Dinners Club. Please ensure that you put your invoice number as your reference. Please acknowledge to Kay Mahoney if you wish to pay by credit card and a link will be sent to you by WorldPay with instructions on how to pay.

Accommodation: On request attendees will be provided information on hotels and the code for concessionary rates for the conference delegates.

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

Company: _____ Position _____
 Address: _____
 Phone: _____ Fax: _____ E-mail: _____

Address for Registration: Please post/ fax/ e-mail this form to:

European Technology Development, Fountain House, Cleeve Road, Leatherhead, Surrey KT22 7LX, UK
 Tel: + 44 1372 363 111 Fax: + 44 1372 363 222
kmahoney@etd-consulting.com www.etd-consulting.com