

MIMA-3 Int. Conference

MIMA - Materials, Inspection, Monitoring and Assessment

SUSTAINABLE POWER GENERATION

**Electricity Generation through Fossil, Nuclear and Renewables -
Materials, Inspection, Monitoring, Digitalisation & Flexibility**

Venue: Woburn House, 20 Tavistock Square, London www.woburnhouse.co.uk
(a few minutes walk from Euston, Kings Cross & St. Pancras Train & underground stations)

Dates: 17 - 19 October, 2023

Programme & Registration Form

Note: This Conference will be preceded by a 1-day **Training Course** on 16 Oct. 23, being held at the same venue. See: www.etc-consulting.com/events



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CONFERENCE OBJECTIVES

The **aim** of this international conference is to provide an international platform for the exchange of knowledge and experience related to various power generation plant issues including their decarbonisation, materials, inspection/ monitoring, safe operation and condition/life assessment. The main theme is how to make power generation more sustainable and reliable.

Topics which have currently gained much significance such as fossil power plant flexible operation in view of the increasing intervention of the renewables, use of low or zero carbon clean fuels such as hydrogen and ammonia or a mix of such fuels with the existing fuels, digitalisation of the power industry, the challenge of the fabrication and inspection of newly developed materials for the new generation of fission and fusion nuclear power plants and for wind turbines will be discussed in this three day event.

CONFERENCE FORMAT/ ORGANISATION / PRESENTATION TIMES

The Conference will principally consist of presentations of 25 mins. each, including about 3 mins. for questions/answers. Keynote presentation will be of 35 mins. duration including about 3 mins. of questions/answers.

WHO SHOULD ATTEND?

Plant operators, owners, designers, fabricators, inspection companies and service providers will be the prime audience in this conference. It is also envisaged that other organisations such as research institutes and universities will equally benefit from this experience and the information exchange.

DEADLINES

PRESENTATIONS: To be sent to ETD by: **Monday 2nd October, 2023.**

SUBMISSIONS

Proceedings: ETD will aim to provide the presentations to the attendees about one week before the start of the conference to make sure that the attendees get maximum benefit from the conference.

All Submissions (& Technical Enquiries to):

Dr Ahmed Shibli ashibli@etd-consulting.com Tel: +44 788 109 7730

Administration Related Enquiries to: enquiries@etd-consulting.com

SUBMISSION OF PAPERS (OPTIONAL)

Arrangements are being made for the publication of a Special Issue of an international journal. As this Conference is aimed at industry, submission of papers is optional but those which are submitted will be considered for publication in this Special Issue.

Conference Technical Committee

Eur Ing. Staf Huysmans, ENGIE Laborelec, Belgium Chairman	Dr Andreas Klenk, MPA Stuttgart, Germany
Mr Rod Vanstone, Consultant, UK, Co-Chairman	Mr Steven Stultz, Combined Cycle Journal, USA
Dr Ahmed Shibli, ETD, UK, Coordinator	Dr Stuart Holdsworth, EMPA, Switzerland
Dr David Allen, ETD, UK	Dr S Kihara, Best Materia, Japan
Dr Hong-Wei Wang, ETD, UK	Dr Andy Morris, EDF, UK
Dr Andrea Tonti, INAIL, Italy	Dr K Yagi, National Center for Materials Service Safety, University of Science & Technology Beijing, China
Prof K-B Yoon, Chung Ang University, Korea	

MIMA-3

Conference Organising Committee

Dr Ahmed Shibli, ETD, UK	Chamila Kariyawasam, ETD, UK
Dr David Allen, ETD, UK	Feroza Akther, ETD, UK

The Organiser

European Technology Development (ETD)

ETD is an independent UK based engineering, consulting and R&D company specialising in high temperature plant inspection and life assessment /extension, maintenance, materials and engineering issues in power generating and petrochemical/process plant. ETD has, in the past, organised various international workshops/ courses/ conferences in the UK, Europe, USA, Canada, South Africa, Japan, Korea and other countries of Asia, mainly on the issues dealing with power and process 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), Reliability Centred Maintenance (RCM), probabilistic life and crack assessment, weld repairs etc.

The company has been leading and co-ordinating a number of large cutting edge international industry projects (supported by the industry from North America, Japan, Europe and elsewhere or by the UK government and European Commission) on issues related to the assessment and improvement of high temperature plant performance, materials and design, maintenance and inspection strategies, and the development of innovative inspection techniques. The company has carried out/ participated in leading edge projects on P91 and P92 weld repairs, long term creep rupture data generation, crack assessment, integrity issues and has carried out studies of P/T91 performance in plant worldwide.

The company has developed its own unique equipment (in collaboration with other industry) such as a portable spark erosion machine for 'boat sampling', a portable AFM for early-stage creep cavitation damage detection in P91/ P92 components, a precision portable hardness tester called 'Smart Sleeve'.

Further information on ETD, its consulting services, full plant inspection and life assessment, training courses offered and other activities can be seen at: www.etc-consulting.com

CONFERENCE PROGRAMME

[**Note:** This is the DRAFT Programme and may be extended to some parallel sessions or Poster Papers in view of more papers expected]

DAY – 1

Tuesday 17th October 2023

0930 – 1745h

INTRODUCTION TO THE CONFERENCE

(0930 - 0945h)

Dr Ahmed Shibli, ETD, UK (Conference Coordinator)

Eng. Staf Huysmans, ENGIE, Belgium (Conference Chairman)

Rod Vanstone, Consultant, Ex-GE, UK (Conference Chairman)

SESSION 1: DECARBURISATION OF FOSSIL POWER PLANTS

(0945 – 1230h)

Paper 1-1 (0945-1020h)

Keynote:

Long term impact of hydrogen combustion on gas turbine hardware

Kurt Boschmans, Antoine Mochel, Evy De Bruycker, Steve Nardone

ENGIE Laborelec, Belgium

Paper 1-2 (1020-1045h)

Materials for H₂ fired industrial gas turbines

Joy Sumner, Andrew Potter, Stefano Mori, Nigel Simms, Cranfield University, Cranfield,

Bedfordshire, UK

Paper 1-3 (1045-1110h)

Technology adoption in fossil fuel power plants in the decarbonization era

Mohd Khairulnizam bin Junoh, TNB Power Generation Sdn. Bhd., Malaysia

SHORT BREAK 1110 – 1130h (20mins.)

Paper 1-4 (1130-1155h)

Using alternate fuels in existing gas turbines: An opportunity for utilisation of gas turbine assets in economic way for decarbonization and grid stability in renewable era

Pankaj Kumar Gupta, General Manager, Suneet Mehta, Sr. Manager, Energy Transition & Policy

Research, NTPC, India

Paper 1-5 (1155-1220h)

Opportunities and technical challenges of hydrogen as a fuel for firing in combined cycle gas turbines in power generation

Hong Wei Wang, Ahmed Shibli, David Robertson, European Technology Development Ltd.,

Leatherhead, Surrey, U.K.

Paper 1-6 (1220-1245h)

Title to be confirmed.

LUNCH 1245 – 1345h (1 hr)

SESSION 2: RENEWABLES & FLEXIBLE OPERATION OF FOSSIL POWER PLANTS

(1345 – 1545h)

Paper 2-1 (1345-1420h)

Keynote

How hydropower contributes to the integration of intermittent renewable energy?

Maryse Francois, France

Paper 2-2 (1420-1455h)

Keynote

Flexible and future-proof HRSGs

Sebastiaan Ruijgrok, Peter Rop, NEM Energy B.V., The Netherlands

Paper 2-3 (1455-1520h)

ETD's studies of fossil power plant flexible operation in Europe, North America and Asia – technical and cost issues

Ahmed Shibli, European Technology Development Ltd., Leatherhead, Surrey, U.K.

Paper 2-4 (1520-1545h)

Cost impacts, cycling and reliability issues

Nadeem Ahmed, ETD Consultant, European Technology Development Ltd., Leatherhead, Surrey, U.K.

COFFEE BREAK 1545 – 1615h (30mins.)

SESSION 3: WIND TURBINES - THEIR INSPECTION AND DAMAGE ANALYSIS

(1615 – 1800h)

Paper 3-1 (1615-1640h)

Evaluation of hyperspectral imagery for damage assessment of wind turbine blades

Andy Gibson¹, Sarinova Simandjuntak², Emily Dunkason¹, Hanly Bingari¹, Alex Fraess-Ehrfeld³

1. University of Portsmouth, Portsmouth, UK

2. Anglia Ruskin University, East Anglia, UK

3. Airborne Robotics Ltd., UK

Paper 3-2 (1640 -1705h)

Waiting for the title/ abstract

Wind Turbine Co.1

Paper 3-3 (1705-1730h)

Enhancing the reliability of wind turbine blade inspection procedure

Saber Khayatizadeh, Ilostta Ltd., Glasgow, UK

Paper 3-4 (1730 -1755h)

Waiting for the title/ abstract

Wind Turbine Co. 2

DAY – 2 Wednesday 18th October 2023 0900 – 1630h

WELCOME and INTRODUCTION TO DAY-2 (0900 - 0905h)

SESSION 4: MATERIALS FOR NUCLEAR & FOSSIL POWER PLANTS
(INCLUDING FUSION) (0905 - 1430H)

Paper 4-1 (0905-0940h)

Keynote

Nuclear paper to come

Paper 4-2 (0940-1005h)

TRANSFUSION – a project to transfer high temperature materials technology from fossil to fusion energy

David Allen, European Technology Development Ltd., Leatherhead, Surrey, U.K.

Paper 4-3 (1005-1030h)

Schemes to enhance the integrity of P91 steel reheat steam pipe in a supercritical thermal power plant

Hyeong-Yeon Lee^{†}, Ki-Ean Nam^{*}, Min-Su Yoon^{**}, and Seung-Woo Ha^{**}*

*^{**}Korea Atomic Energy Research Institute, ^{**}Korea Leading Engineering System Inc., Korea*

COFFEE BREAK 1030 – 1100h (30 mins.)

Paper 4-4 (1100-1135h)

Keynote

Research subjects on damage and life evaluation of 9Cr steels used in USC power plants

K Yagi, M Wang and Y Lu, National Center for Materials Service Safety, University of Science & Technology Beijing, China

Paper 4-5 (1135-1200h)

Molecular dynamics simulation of thermomechanical fatigue and isothermal fatigue properties of Ni-based single crystal superalloys

Wenping Wu, Department of Engineering mechanics, School of Civil Engineering, Wuhan University, Wuhan, China

Paper 4-6 (1150-1215h)

Creep at very low stresses in austenitic stainless steels

Rolf Sandström, Materials Science and Engineering, KTH Royal Institute of Technology, Stockholm, Sweden

Paper 4-7 (1215-1240h)

Challenges and parameters effect of wire arc additive manufacturing of nickel-based alloy

*Rafael Nunes, Koen Faes, Belgian Welding Institute, Belgium
Staf Huysmans, Evy De Bruycker, Engie Laborelec, Belgium*

LUNCH 1240 – 1325h (45 mins.)

Paper 4-8 (1325-1350h)

Effects of heat treatment on creep strength of SS321 manufactured by powder bed fusion

Hyung Ki Ryu^a, Young Wha Ma^b, Thi Giang Le^c and Kee Bong Yoon^{d}*

^aGraduated Student, ^bSenior Researcher, ^cPost Doctoral Fellow, ^dProfessor

^{a, c, d}Department of Mechanical Engineering, Chung Ang University, Seoul, Korea

^bCorporate R&D Institute, Doosan Heavy Industries & Construction, Changwon, Gyeongnam, Korea

Paper 4-9 (135 -1415h)

Dosing-layer-quality monitoring in condenser tubes

Phoenix Lai Fung Cheng, CLP, Hong Kong

Paper 4-10 (1415-1440h)

Sigma phase issue in boiler tubes made from TP304H

Suraya binti Mohd Nadzir, TNB Research, Malaysia

COFFEE BREAK 1440 – 1510h (30 mins.)

Paper 4-11 (1510-1545h)

Keynote

ECCC creep data assessment methodologies for design of high temperature plant – fit for purpose?

David Allen, European Technology Development Ltd., Leatherhead, Surrey, UK

Paper 4-12 (1545-1610h)

Issues with materials in fossil power plants; typical findings from NTPC stations and their analyses

Rajeev Jain, AGM, Corporate Quality Assurance, NTPC

Bhaskara Santosh K P, DGM, Project Engineering - Mechanical, NTPC, India

Paper 4-13 (1610 -1635h)

Creep damage and creep lifetime prediction: correlation or causation?

Zhongyu Lu, and Qiang Xu, School of Computing and Engineering, University of Huddersfield, Huddersfield, UK

Paper 4-40 (1635-1700h)

Prevention of exfoliation in Super 304H/ 347H tubes of super critical boilers by in-situ shot peening

Srinivasa Rao U, DGM, Corporate Quality Assurance, NTPC

Anubhav Dahiya, DGM, Project Engineering - Mechanical, NTPC

Bhaskara Santosh Kumar, DGM, Project Engineering - Mechanical, NTPC

Anand D Varma, Senior Manager, NTPC Energy Technology Research Alliance, NTPC, India

BOAT TRIP ON RIVER THAMES & BBQ DINNER 1800 – 2200h



WELCOME and INTRODUCTION TO DAY- 3

(0900 - 0905h)

SESSION 5: INSPECTION, MONITORING & DIGITALIZATION – CHALLENGES AND DEVELOPMENT OF NEW MORE ADVANCED TECHNIQUES

Paper 5-1 (0905-0940h)

Keynote

DX (Digital Transformation) of plant maintenance with online monitoring and AI analysis

S Kihara and H Matsuda, Best Materia, Tokyo, Japan

Paper 5-2 (0940-1005h)

Portable Scanning Force Microscope – A new development for early stage micron or sub-micron level damage detection and life assessment

Andrea Tonti, INAIL, Italy

Cheng-Jung Lin, Ahmed Shibli, European Technology Development Ltd., Leatherhead, Surrey, UK

Paper 5-3 (1005-1030h)

Advanced Data Analysis procedure for improving failure assessment in pipes

Saber Khayatadeh, Ilosta Ltd., Glasgow, UK

David Robertson, European Technology Development Ltd., Leatherhead, Surrey, UK

COFFEE BREAK 1030 – 1100h (30 mins.)

Paper 5-4 (1100-1135h)

Keynote

Utilising plant inspection and monitoring data more effectively – challenges and opportunities

Andy Morris, EDF, UK

Rossella Bonetti, Wei Sun, University of Nottingham, UK

Paper 5-5 (1135-1200h)

Further developments in CRACKFIT – software for the assessment of cracks in boilers and turbines

Stuart Holdsworth, EMPA, Switzerland

Hong-Wei Wang, Feroza Akther, European Technology Development Ltd., Leatherhead, Surrey, UK

Paper 5-6 (1200-1225h)

Scanning Electrical Potential Drop (S-EPD) for off-line NDT determination of remaining lifetime in P91 pressure vessel welds

A G Wojcik, Department of Mechanical Engineering, University College London, UK

A S Santos, Matelect Ltd, Harefield, UK

M Waitt, Matelect Ltd, Harefield, UK

A Shibli, ETD Ltd, Leatherhead, Surrey, UK

LUNCH 1230 – 1310h (40 mins.)

Paper 5-7 (1310-1335h)

MAGSCAN-2: Development of a rapid scanning electromagnetic tool for the quality assurance of martensitic steel (P91, P92) plant components

John Wilson, Anthony Peyton, University of Manchester, UK

David Allen, Cheng-Jung Lin, European Technology Development, Leatherhead, Surrey, UK

Paper 5-8 (1335 -1400h)

Mechatronics design and architecture of evaluation software for a portable instrumented indentation system PIIS3000™

Daniel Omacht¹, Yingzhi Li², Mingcheng Sun³

¹ UTMdev s.r.o., Ostrava-Vitkovice, Czech Republic

² DNV-GL (former KEMA, retired), Arnhem, The Netherlands

³ State Grid Liaoning Electric Power Research Institute, Shenyang, China

Paper 5-9 (1400 -1425h)

Title to be confirmed.

DISCUSSION & CLOSING REMARKS 1430 -1500h

Chairman: xxxxxxxxxxxxxxxx

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REGISTRATON FORM

Please complete and email to: enquiries@etd-consulting.com

MIMA-3

International Conference:
High Temperature Plant: Materials, Inspection, Monitoring and Assessment (MIMA-3)

Venue: London (exact venue to be announced soon)

Dates: 17 – 19 October 2023

Registration Fee: Please put 'x' in the relevant box and show the total payment.

Fee is to be paid in GB Pounds. (all those attending events held in the UK need to pay 20% VAT).

Fee to be paid is shown in bold.

	Reduced Fee (Until 18 Sep. 23)	x	Full Fee (From 19 Sep. 23)	x
Conference Delegates	£500+100 VAT = £600		£550+£110 VAT = £660	
Conference Presenters	£400+£80 VAT = £480		£400+£90 VAT = £480	
Please show here no. of attendees <input style="width: 40px;" type="text"/> x £ <input style="width: 40px;" type="text"/> Total Amount Payable = £ <input style="width: 60px;" type="text"/>				

Conference Registration Fee covers: Organisation of the Conference, provision of the Conference Presentations in electronic format, lunches, coffee/ tea during the breaks and boat trip on River Thames including the conference dinner on the boat.

How to Pay: When paying please quote reference 'MIMA-3 Conf.' 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 request)

2) Credit Cards: Payment information will be provided on request.

When registering, please state here how you paid or intend to pay:

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Delegate/ Speaker Details

Name:	Job Title (optional):
Company:	Address:

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Please email Registration Form, including all enquiries, to: enquiries@etd-consulting.com