



**'HIDA-8'**

# 3-days Online International Conference

## HIGH TEMPERATURE PLANT CRACKING, DAMAGE & LIFE ASSESSMENT

HIDA-8

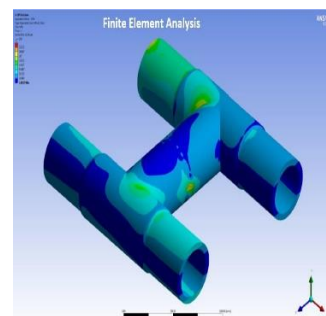
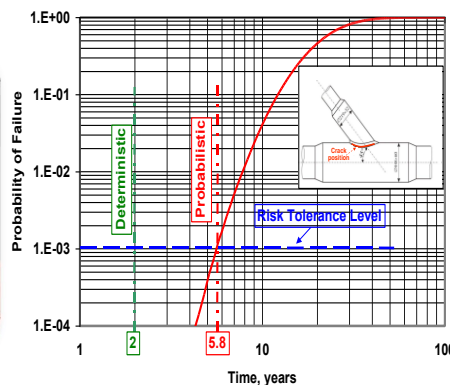


Institute of Materials, Minerals & Mining, London

Venue: Online (from London)

Dates: 20 – 22 April 2021

### PROGRAMME & Registration Form



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(Details on page 4)



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Online International Conference

## INTRODUCTION

HIDA (High-temperature Defect Assessment) was a European Commission and industry supported research project aimed at unifying European defect assessment procedures with validation on a number of materials of interest to high temperature industry. Assessment of the behaviour of high temperature plant components containing defects and operating under steady and/or cyclic load conditions has become an area of urgent need and interest. The series of HIDA conferences, started in April 1998, have now become a regular event aimed at addressing this need. The first HIDA Conference (HIDA-1) was held in Paris in April 1998 and was considered to be a highly focused event. HIDA-2 Conference was organised in Stuttgart, Germany, at the end of the 4-year duration of the HIDA project. HIDA-3 was held in Lisbon, Portugal, and was aimed at crack growth and other high temperature behaviour of repair welds. HIDA-4 held at the Cambridge University, UK, was aimed at bringing together experts, academics, researchers and industry personnel interested in assessing the behaviour and life of defect containing components using probabilistic assessment. HIDA-5 was held at the University of Surrey, UK, and considered a wider scope including Fitness-for-Service and RBI. HIDA-6 was held in Nagasaki, Japan, in December 2013 and encompassed plant experience including experience with the new steels and creep-fatigue interaction. HIDA-7 was held in March 2017 at the University of Portsmouth, UK, and covered life and crack assessment of industrial components including costs and benefits of life extension of older plants when operating both in base load and flexible modes. HIDA-8 will cover crack assessment, repair and inspection and monitoring of cracks and the development of pre-crack damage.

Due to Covid-19 since the start of 2020 organisation of large face-to-face international conferences has become prohibitive limiting exchange of knowledge, data and discussions on many new and exciting developments over the last few years, hence this innovative idea of organising online Zoom HIDA-8. The organisers have been encouraged by the successful conduction of ETD's 2-days Zoom online MIMA (Materials, Inspection, Monitoring and Assessment) conference held in October 2020 which was attended by 80 delegates from around the world.

## ONLINE CONFERENCE FORMAT

The online conference presentations will each be of 25-minutes duration including questions at the end of each presentation. All attendees will be requested to keep their videos band microphones muted to avoid disturbance from the background noise during a presentation. During the question time at the end of a paper all attendees will be free to turn their videos on but will need to keep their mics muted. The Session Chairperson will invite a questioner to unmute her/his mic. and speak. The session moderator will ensure that only one questioner is able to speak at a time when all other attendees, except the questioner and the presenter, will remain muted. You don't need to remember all this as before the start of a session all this will be described by the organisers!

## WHO SHOULD ATTEND?

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

## SUBMISSION OF PAPERS

Arrangements have been made for the publication of a Special Issue of the ‘Journal of Strength, Fracture and Complexity’. 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.

### All Technical Enquiries to:

Dr Ahmed Shibli [ashibli@etd-consulting.com](mailto:ashibli@etd-consulting.com) Tel: +44 788 109 7730

## 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 all type of power generating and petrochemical/ process plant. It also serves oil and gas sectors in general. ETD has also been organising various international workshops/ training courses and conferences in the UK, Europe, USA, Canada, Japan, Korea and other Asian countries mainly on the issues such as: power and process plant inspection and 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 Centered 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 weld repairs, crack assessment, integrity issues and has carried out studies of P/T91 performance in plant worldwide. The company also specialises in power plant cyclic operation issues.

Further information about ETD, its projects, life assessment courses offered and other activities can be seen at: [www.etd-consulting.com](http://www.etd-consulting.com)

## CONFERENCE COMMITTEE

Dr Ahmed Shibli, ETD, UK	Prof A T Yokobori, Teikyo University, Japan
Dr David Allen, ETD, UK	Prof Staf Huysmans, ENGIE, Belgium
Ms Feroza Akther, ETD, UK	Dr Qiang Xu, Huddersfield University, UK
Dr Andrea Tonti, INAIL, Italy	Dr Stuart Holdsworth, EMPA, Switzerland
Dr Andreas Klenk, MPA Stuttgart, Germany	Dr S Simandjuntak, University of Portsmouth, UK
Ms Fiona McHugh, ETD, UK	Mr Damien Charman, IRIS NDT, Australia
Prof Changyu Zhou, Nanjing Tech. University, China	



**crystals**

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IMPACT  
FACTOR  
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## Mechanical Degradation of Advanced Energy - Related Alloys: Processing, Microstructure, and Testing

### Guest Editors

Dr. Yiyu Wang, Dr. Xu Xu, Dr. Zaiqing Que, Prof. Dr. Wei Sun

### Deadline

25 September 2021

# Special Issue

[mdpi.com/si/78908](https://www.mdpi.com/si/78908)

Invitation to submit

**Crystals** (ISSN 2073-4352, IF 2.404) is a peer-reviewed open access journal, published monthly online by MDPI, that covers all aspects of crystalline material research, including liquid crystals, Mineralogical Crystallography and Biomineralization and biomolecular crystals.

At present, Crystals ranks 10/26 (Q2) in the 'Crystallography' category of Web of Science.

<https://www.mdpi.com/journal/crystals>

**Special Issue** "Mechanical Degradation of **Advanced Energy-Related Alloys**: Processing, Microstructure, and Testing"

*Edited by:* Dr. Yiyu Wang, Dr. Xu Xu, Dr. Zaiqing Que, Prof. Dr. Wei Sun

[https://www.mdpi.com/journal/crystals/special\\_issues/energy\\_alloys](https://www.mdpi.com/journal/crystals/special_issues/energy_alloys)

# CONFERENCE PROGRAMME

**UK time throughout**

**DAY – 1**      Tuesday 20<sup>th</sup> April 2021      0800 – 1400h      (UK time)

**INTRODUCTION TO THE CONFERENCE**      (0800 - 0815h)

**SESSION 1: INSPECTION, DAMAGE & CRACKING UNDER CREEP,  
FATIGUE AND OXIDATION CONDITIONS**      (0815 – 1400h)

*Chairman: Dr. David Allen, ETD, UK*

*Paper 1-1 (0815 -0840h)*

**Assessment of Creep Damage in Welded P91 T-pieces of Main-Steam and Hot Reheat Steam Piping Systems**

*David Robertson, ETD Consulting, Leatherhead, Surrey, UK*

*Paper 1-2 (0840 -0905h)*

**Embrittlement of HP40Nb Heat-Resisting Alloy at Intermediate Operating Temperatures**

*D B Swanepoel, Metallurgical Engineering Department, Sasol, South Africa*

*K Eschbach, Research and Development Services, Schmidt and Clemens, Germany*

*Paper 1-3 (0905 -0930h)*

**Acceptability Assessment of Casting Weld Defects Under Transient Thermal Loading**

*Ronnie Scheepers, Corporate Consultant: Structural Integrity, Eskom, South Africa*

*Marthinus Bezuidenhout, Corporate Consultant: Power Plant Materials, Eskom, South Africa*

**COFFEE BREAK 0930 – 0945h** (15 mins.)

*Chairman: Dr. Andrea Tonti, INAIL, Italy*

Paper 1-4 (0945 -1010h)

**Combined Creep/ Fatigue/ Oxidation Continuum Damage Modelling Approach in Progressive Failure Analysis at High Temperatures**

*Kamran Nikbin, Department of Mechanical Engineering, Imperial College London, UK*

Paper 1-5 (1010 -1035h)

**Creep-Fatigue Assessment and Damage Evolution of P92 Steel Including Welds**

*T Bender, A Klenk, S Weihe, MPA Stuttgart, Germany*

Paper 1-6 (1035 -1100h)

**Comparison of Wrought and Additively Manufactured IN718 Concerning Crack Growth Threshold and Fatigue Crack Growth Behaviour**

*Timo Brune, Karl Michael Kraemer, Christian Kontermann, Matthias Oechsner  
Chair and Institute for Materials Technology, Technische Universität Darmstadt  
Darmstadt, Germany*

**COFFEE BREAK 1100 – 1115h** (15 mins.)

*Chairman: Prof. Emeritus Staf Huysmans, ENGIE, Belgium*

Paper 1-7 (1115-1140h)

**Practical Aspects of Inspecting P91 Piping System**

*Damien Charman, IRISNDT, Newcastle, Australia*

Paper 1-8 (1140 -1205h)

**The Novosound Belenus: A Truly High Temperature, Flexible Corrosion Monitor**

*Claire Thring, Belenus Applications Specialist, Novosound, Motherwell, Scotland, UK*

**LUNCH BREAK 1205 – 1310h** (1h 5mins.)

*Virtual Guided Tour of Rome: “History of Rome through its Squares and Fountains”*

*by: Dorte Schmidt & Sergio Ciattaglia (1230 – 1300h)*

Paper 1-9 (1310 -1335h)

**Evaluating High-Temperature Creep Degradation in Single Crystal Gas Turbine Materials Through Both Conventional Creep and Small Punch Testing**

*Kurt Boschmans, LABORELEC, ENGIE, Belgium*

Paper 1-10 (1335-1400h)

**Development of New Tools for the Detection of Creep Cavitation and Cracking in High Temperature Plant Components**

*Ahmed Shibli, ETD Consulting, Leatherhead, Surrey, UK*

**DAY – 2**

Wednesday 21<sup>st</sup> April 2021

0800 – 1400h (UK time)

**Introduction to Day-2 & Admin. Matters**

(0800 - 0815h)

**SESSION 2: DEFECTS / CRACKS & LIFE ASSESSMENT**

(0815 - 1400h)

*Chairman: Prof. Kamran Nikbin, Imperial College, London, UK*

*Paper 2-1 (0815 -0840h)*

**Development of Guidelines for Simplifying Fracture Mechanics Assessment in the High Temperature Regime**

*Andreas Klenk, Annett Udoh, Magdalena Speicher, MPA Stuttgart, Germany*

*Falk Müller, ifW Darmstadt, Germany*

*Paper 2-2 (0840 -0905h)*

**Factors Influencing the Analytical Representation of Creep Crack Development in Alloy 939**

*Stuart Holdsworth, EMPA, Switzerland*

*Paper 2-3 (0905 -0930h)*

**‘Crackfit’ - A Defect Assessment Tool for Pressure Vessels, Piping and Turbine Defect/ Crack Assessment at Low and High Temperatures**

*Baginda Affendy, ETD Consulting, Leatherhead, Surrey, UK*

**COFFEE BREAK 0930 – 0945h** (15 mins.)

*Chairman: Dr. Andreas Klenk, MPA Stuttgart, Germany*

*Paper 2-4 (0945 -1010h)*

**The Correlation of Behaviour of Vacancy Diffusion With Creep Damage Progression Around A Notch Tip for W Added 9Cr Steel**

*A Toshimitsu Yokobori Jr.\* and Haruki Ishikawa\*\**

*\*Teikyo University, \*\* Graduate School of Tohoku University, Japan*

*Paper 2-5 (1010 -1035h)*

**Bolt Loading Effects on the Structural Integrity Assessment of Defects in Industrial Components**

*Ronnie Scheepers, Eskom Corporate Consultant: Structural Integrity, South Africa*

*Marthinus Bezuidenhout, Eskom Corporate Consultant: Power Plant Materials, South Africa*

*Paper 2-6 (1035-1100h)*

**A Perspective on the Wilshire Creep Equations** (new title)

*John M Brear, John Brear – Plant Integrity, Llanelli, UK*

**COFFEE BREAK 1100 – 1115h** (15 mins.)

*Chairman: Dr. David Robertson, ETD, UK*

Paper 2-7 (1115 -1140h)

**An Overview of the Condition Assessment Approach Followed for an Aged Carbon Steel Pipeline Network in High Pressure Superheated Steam Service to Support Continuous Operation by Means of a Phased Replacement Strategy**

*Leanne Matthysen, Metallurgical Engineering Lead – Sasol Ltd., South Africa*

Paper 2-8 (1140 -1205h)

**Further Calibration of Creep Cavitation Model for 316H Steel**

*Guoling Fu and Qiang Xu, Department of Engineering and Technology, School of Computing and Engineering, University of Huddersfield, UK*

<b>LUNCH BREAK 1205 – 1250h</b> (45 mins.)
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Paper 2-9 (1250 -1315h)

**Conditional Operation of Boiler Components Working Under Creep Conditions Until Replacement**

*Jerzy Trzeszczyński and Ewa Trzeszczyńska, Pro Novum sp. z o.o., Poland*

Paper 2-10 (1315 -1340h)

**A Case Study: Life Assessment of a Superheater Outlet Header Using ETD's Newly Developed 'Boiler Life Assessment Software' (BLAS)**

*F Akther, ETD Consulting, Leatherhead, Surrey, UK*

Paper 2-11 (1340 -1405h)

**Technology Transfer of AC/DC-EPD Creep Monitoring Methods for Real-Time, Remote Continuous Monitoring of Creep Damage in Power and Process Plant**

*Adam Wojcik, Mechanical Engineering, University College London, UK*

*Alberto Santos, Mathew Waitt, Matelect Ltd, Harefield, UK*

*Ahmed Shibli, ETD Consulting, Leatherhead, Surrey, UK*



**Introduction to Day-3 & Admin. Matters**

(0800 – 0815h)

**SESSION 3: MARTENSITIC STEELS – CRACKING, LIFE ASSESSMENT  
AND MODELLING**

(0815 – 1400h)

*Chairman: Dr. Stuart Holdsworth, EMPA, Switzerland, UK*Paper 3-1 (0815 -0840h)**Creep Ductility-based Models for Creep Strength Enhanced Ferritic Steels: A Review***R Ragab<sup>a</sup>\*, J. Parker<sup>b</sup>, M. Li<sup>a</sup>, T. Liu<sup>a</sup>, A. Morris<sup>c</sup>, W. Sun<sup>a</sup>**<sup>a</sup> Faculty of Engineering, University of Nottingham, Nottingham NG7 2RD, UK**<sup>b</sup> Electric Power Research Institute, Charlotte, NC, USA**<sup>c</sup> EDF Energy (UK), Coal Gas and Renewables, Central Technical Organisation, Gloucester, UK*Paper 3-2 (0840 -0905h)**The Correlation of Creep Deformation with Damage Progression Behaviour Around a Notch Tip for W Added 9Cr Steel***A Toshimitsu Yokobori Jr.\*, Haruki Ishikawa\*\* and Ryuji Sugiura\*\*\***\*Teikyo University, \*\* Graduate school of Tohoku University, \*\*\* Nihon University, Japan*Paper 3-3 (0905 -0930h)**Inspection and Life Assessment of “Aberrant” Mis-Manufactured Martensitic High Temperature Steels***David Allen, David Robertson, Ahmed Shibli, ETD Consulting, Leatherhead, Surrey, UK***COFFEE BREAK 0930 – 0945h***Chairman: Dr Sarinova Simandjuntak, University of Portsmouth, UK*Paper 3-4 (0945 -1010h)**New Italian Standard for the Creep Assessment of Martensitic Steels***Andrea Tonti, Corrado Delle Site, INAIL and Luana Campanile, ex-INAIL, Italy*Paper 3-5 (1010 -1035h)**Lifetime Assessment of Prematurely Cracked P91 Weldments at Intermediate Temperatures and Low Stress Loading***Ludwig Limmer, Kinetica GmbH, Nurnberg, Germany*Paper 3-6 (1035 -1100h)**All-Positional Flux Cored Wire With Lower Trace Element Contents and Improved Ambient Temperature Toughness for Welding P91 Steels***Zhuyao Zhang, Sorin Craciun, Vincent van der Mee, Lincoln Electric, Europe*

## **HIDA PRIZE GIVING CEREMONY + BREAK (1100 – 1200h)**

### **HIDA Prize Giving Ceremony: 1115 – 1145h (30 mins.)**

Given to prominent scientists/ engineers for their contribution to research or services to high temp. plant materials, inspection, monitoring and particularly damage and crack assessment.

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**Please feel free to send your recommendations and the reasons for the recommendations.  
The Conference Committee will pick up to five prize receivers from the participants.**  
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*Chairman: Dr Qiang Xu, University of Huddersfield, UK*

*Paper 3-7 (1200 -1225h)*

#### **Prediction of creep damage**

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

*Paper 3-8 (1225 -1250h)*

#### **The Development of Creep Damage Constitutive Equations for High Cr Alloys**

*Xin Yang<sup>1</sup>, Zhongyu Lu<sup>2</sup> and Qiang Xu<sup>1</sup>*

*<sup>1</sup>Department of Engineering and Technology, School of Computing and Engineering, University of Huddersfield, UK*

*<sup>2</sup>Department of Informatics, School of Computing and Engineering, University of Huddersfield, UK*

*Paper 3-9 (1250 -1315h)*

#### **Investigating the Combined Residual Stresses and Fluid-Structure Interaction FE**

#### **Analysis for the Integrity Assessment of Induction Bent Pipes**

*Bing Lin, Sarinova Simandjuntak, School of Mechanical and Design Engineering, University of Portsmouth, UK*

*Paper 3-10 (1315 -1340h)*

#### **Remaining Life Assessment Method of Grade 91 Steel Welded Joint of In-Service Piping Considering Data Scatter**

*Masatsugu Yaguchi, Materials Science Research Laboratory, Central Research Institute of Electric Power Industry (CRIEPI), Japan*

## **CLOSING DISCUSSION 1340-1400h (20 mins.)**

*Chaired by: Dr Ahmed Shibli, ETD, UK*

**REGISTRATION FORM (Please email)**

International Online Conference

**HIDA-8**

**CRACKING & DAMAGE IN HIGH TEMPERATURE PLANT**

**Dates:** 20 – 22 April 2021

**Registration Fee:** Please put ‘x’ in the relevant box and show the total payment.

<i>Fee is to be paid in GB Pounds.</i>	<b>Reduced Fee</b> (Until 22 Mar. 21)	x	<b>Full Fee</b> (From 23 Mar. 21)	x
<b>Conference Delegates</b>	£400		£450	
<b>Conference Presenters</b>	£300		£350	
Please show here (no. of attendees x £ ): <b>Total Amount Payable = £</b>				

**Conference Registration Fee** covers: Organisation of Conference, Recording & Provision of Presentations and Conf. Proceedings.

**How to Pay:** *When paying please quote reference ‘HIDA-8’ 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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**All Registration & Payment enquiries to:** [enquiries@etd-consulting.com](mailto:enquiries@etd-consulting.com)

**Delegate/ Speaker Details**

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

Company:

Job Title (optional):

Address:

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