

# RESIDUAL STRESS: TECHNIQUES AND SOLUTIONS FOR INDUSTRY APPLICATIONS

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Institution of  
**MECHANICAL  
ENGINEERS**

Structural Technology and Materials Group  
**Seminar**

**6 December 2017**  
One Birdcage Walk, London

## KEY SPEAKERS INCLUDE:

Tom Siddall, Group Head, Structural Analysis Group,  
CTO Structural Integrity Branch

**EDF Energy**

Zidane Tahir, Senior Design Analyst, Design, Testing  
& Development

**Gestamp**

Wei Li, Materials Technologist

**Rolls-Royce**

Li Xu, Senior Specialist, Fracture Mechanics & Fatigue  
Analysis

**Lloyd's Register Marine & Offshore**

Anas Yaghi, Senior Research Engineer  
**The Manufacturing Technology Centre**



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# RESIDUAL STRESS: TECHNIQUES AND SOLUTIONS FOR INDUSTRY APPLICATIONS

6 December 2017, One Birdcage Walk, London

## THIS ONE DAY SEMINAR WILL DISCUSS THE LATEST TECHNIQUES TO EFFECTIVELY ANALYSE AND MEASURE RESIDUAL STRESS IN A VARIETY OF SITUATIONS AND MATERIALS.

Learn from engineers and academics including **TWI Ltd.**, **Rolls-Royce**, **University of Manchester**, **Gestamp**, **National Physics Laboratory** and other thought leaders in industry. Learn about the latest techniques and solutions from real-life case study presentations for more accurate measurement and modelling.

Take this opportunity to share cross-industry best practice during interactive panel discussions and networking sessions. Enable your organisation to better identify and control residual stress and to mitigate against catastrophic material failures.

### ATTEND THIS SEMINAR TO:

- Gain key insights about how to mitigate the risk of fatigue and fracture
- Learn about measurement, design and structural integrity from the nuclear and transport industries to benchmark and improve your strategies
- Improve your practices by finding out how a variety of industries manage the challenges posed by residual stress
- Participate in the conversation during question and answer sessions and panel discussions for further advice and learning opportunities
- Network with industry thought-leaders from energy and manufacturing organisations, academic researchers and consultants

### KEY TOPICS INCLUDE:

- **National Physical Laboratory** discusses validation and standardisation of residual stress measurement
- **Gestamp** outlines the residual stress challenge on designing automotive chassis suspension
- **Rolls-Royce** shares key insights into residual stress and length scales
- Find out about relaxation methods to measure residual stress in nuclear weldments from **University of Manchester**
- Hear from **TWI Ltd.** about predicting residual stresses and using them to assess fatigue
- Learn from **Lloyd's Register Marine & Offshore** about industrial applications of residual stress in fatigue and fracture mechanics analysis

### ORGANISING COMMITTEE:

Structural Technology and Materials Group  
**Institution of Mechanical Engineers**

### ORGANISING COMMITTEE MEMBERS:

Simon Quinn, Director, Research Institute for Industry (Rifi),  
**University of Southampton**

Narmeen Rehman, Mechanical Engineer, Fuel Route Systems,  
**EDF Energy**

Joy Tao, HYA/HAR Component Life Assessment Lead, Structural Analysis Group, Structural Integrity Branch,  
**EDF Energy**

Tim Morris, Chief Executive,  
**NAFEMS**

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TERMS AND  
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# PROGRAMME

**WEDNESDAY 6 DECEMBER 2017**

<b>08:30</b>	<b>REGISTRATION AND REFRESHMENTS</b>
<b>09:00</b>	<b>CHAIR'S OPENING REMARKS</b>
	<b>MODELLING AND MEASURING RESIDUAL STRESS</b>
<b>09:15</b>	<b>RESIDUAL STRESSES IN HIGH VALUE MANUFACTURING</b> Anas Yaghi, Senior Research Engineer, The Manufacturing Technology Centre
<b>09:40</b>	<b>VALIDATION AND STANDARDISATION OF RESIDUAL STRESS MEASUREMENT</b> Tony Fry, Science Area Leader, National Physical Laboratory
	<b>FATIGUE, FRACTURE AND STRUCTURAL INTEGRITY</b>
<b>10:05</b>	<b>RESIDUAL STRESS AND LENGTH SCALES</b> Wei Li, Materials Technologist, Rolls-Royce
<b>10:30</b>	<b>QUESTION AND ANSWER SESSION</b>
10:45	NETWORKING REFRESHMENT BREAK
<b>11:15</b>	<b>PREDICTING RESIDUAL STRESSES AND USING THEM TO ASSESS FATIGUE</b> Nicholas O'Meara, Project Leader, TWI Ltd. Philippe Bastid, Principal Project Leader, TWI Ltd.
<b>11:50</b>	<b>INDUSTRIAL APPLICATIONS OF RESIDUAL STRESS IN FATIGUE AND FRACTURE MECHANICS ANALYSIS</b> Li Xu, Senior Specialist, Fracture Mechanics & Fatigue Analysis, Lloyd's Register Marine & Offshore
<b>12:15</b>	<b>CASE STUDY ON OIL AND GAS INDUSTRY - DEMONSTRATING AN IMPROVED WELD CLASSIFICATION</b> Charlie Bates, Consultant, Frazer-Nash Consultancy
<b>12:40</b>	<b>QUESTION AND ANSWER SESSION</b>
12:55	NETWORKING LUNCH
	<b>CASE STUDIES IN NUCLEAR INDUSTRY</b>
<b>13:55</b>	<b>EFFECT OF WELDING RESIDUAL STRESS ON STRUCTURAL INTEGRITY AT EDF ENERGY NUCLEAR POWER PLANT</b> Tom Siddall, Group Head, Structural Analysis Group, CTO Structural Integrity Branch, EDF Energy
<b>14:20</b>	<b>RELAXATION METHODS TO MEASURE RESIDUAL STRESS IN NUCLEAR WELDMENTS</b> Matthew Roy, Lecturer in Materials for Demanding Environments, University of Manchester
	<b>CURRENT CHALLENGES AND SOLUTIONS</b>
<b>14:45</b>	<b>DIFFERENT INDUSTRY, SAME PROBLEMS - EXAMPLES FROM A RANGE OF INDUSTRIES</b> Catrin Mair Davies, Senior Lecturer, Imperial College London
<b>15:10</b>	<b>QUESTION AND ANSWER SESSION</b>
15:25	NETWORKING REFRESHMENT BREAK
	<b>CASE STUDIES IN TRANSPORT INDUSTRY</b>
<b>15:55</b>	<b>RESIDUAL STRESS MEASUREMENT FOR ADDITIVE MANUFACTURING - IMPLICATIONS FOR LIGHT-WEIGHTING FOR TRANSPORT SECTORS</b> Hadi Moztafzadeh, Senior Fellow in Mechanical Engineering, WMG, University of Warwick
<b>16:20</b>	<b>RESIDUAL STRESS CHALLENGE IN DESIGNING AUTOMOTIVE CHASSIS SUSPENSION</b> Zidane Tahir, Senior Design Analyst, Design, Testing & Development, Gestamp
<b>16:45</b>	<b>QUESTION AND ANSWER SESSION</b>
<b>16:55</b> PANEL DISCUSSION	<b>A LOOK AT THE FUTURE OF RESIDUAL STRESS</b> Panel Chair: John Bouchard, Professor in Materials for Energy, Materials Engineering, The Open University Tony Fry, Science Area Leader, National Physical Laboratory Philippe Bastid, Principal Project Leader, TWI Ltd. Joy Tao, HYA/HAR Component Life Assessment Lead, Structural Analysis Group, Structural Integrity Branch, EDF Energy. <ul style="list-style-type: none"><li>• How is the study and management of residual stress expected to change?</li><li>• How can academia best support industry?</li><li>• What are the future challenges for the community?</li></ul>
<b>17:25</b>	<b>CHAIR'S CLOSING REMARKS</b>
<b>17:30</b>	<b>END OF SEMINAR</b>

For the most up-to-date and detailed programme for the event, please visit [www.imeche.org/residualstress](http://www.imeche.org/residualstress)

- This programme is subject to change.
- The Institution is not responsible for the views or opinions expressed by individual speakers.

## HOW TO BOOK YOUR PLACE

### FEES AND CHARGES

Fees and charges	Early Bird Rates until 10 November 2017	Standard Rates
Member, Institution of Mechanical Engineers / Supporting Organisation	£255 + VAT = £306	£295 + VAT = £354
Non-member	£345 + VAT = £414	£395 + VAT = £474
Student/Retired	£85 + VAT = £102	£99 + VAT = £118.80

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### THREE WAYS TO BOOK

1 Online:  
[www.imeche.org/residualstress](http://www.imeche.org/residualstress)

2 Email:  
[eventenquiries@imeche.org](mailto:eventenquiries@imeche.org)

3 Phone:  
+44 (0)20 7973 1251

Please read the information listed below as each booking is subject to the Institution's standard terms and conditions.

#### CONDITIONS OF BOOKING

Completed application forms should be returned to the address above, along with the correct payment. Attendance at the event will be confirmed on receipt of the full balance. All participants are advised to bring a copy of their confirmation with them on the day, to ensure the fastest possible entry.

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Please inform us of any special requirements, ie dietary or access, on the relevant section of the booking form or email [eventenquiries@imeche.org](mailto:eventenquiries@imeche.org)

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For a refund (minus £25+VAT admin charge), cancellations must be received at least 30 days prior to the event. Replacement delegates are welcome at any time. The Institution reserves the right to cancel any event. In this case, the full fee will be refunded unless a mutually convenient transfer can be arranged. In the event that the Institution postpones an event for any reason and the delegate is unable or unwilling to attend

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#### CONFERENCE VENUE

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21-22 November 2017, Nottingham

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[www.imeche.org/hrsg](http://www.imeche.org/hrsg)



#### ANNUAL DINNER 2017

23 November 2017, London

The Institution of Mechanical Engineers Annual Dinner will take place at the Science Museum in London to celebrate the engineering profession.

[www.imeche.org/annualdinner](http://www.imeche.org/annualdinner)

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