

12TH EUROPEAN FLUID MACHINERY CONGRESS

Institution of
**MECHANICAL
ENGINEERS**

Fluid Machinery Group
Conference

6-7 October 2014
The Waldorf Astoria Edinburgh -
The Caledonian
www.imeche.org/events/C1395



Following the success of our previous European Fluid Machinery Congress we are returning to Edinburgh this October for the 12th event in the series.

Manufacturers and engineers face growing challenges as technology develops. Ever more stringent demands are driving changes in industry operating practices, while new emerging applications such as shale gas and coal bed methane impose demands for operation under high pressures and temperatures.

This congress showcases the latest fluid machinery technology available and provides a forum for sharing valuable experiences around design, operation and maintenance.

Hear from industry leaders from **BP, AESSEAL PLC, Shell,** and **TNO** to learn how you can improve fluid machinery efficiency and save your company money.

WHEN 6-7 October 2014
WHERE Caledonian Hilton, Edinburgh
BOOK ONLINE www.imeche.org/events/C1395

BENEFITS OF ATTENDANCE:

- **Discover** the latest advances in fluid machinery technology
- **Learn** about new reciprocating compressor solutions for offshore applications
- **Examine** root cause analysis of vibration in pipe systems with centrifugal pumps
- **Understand** the challenges in the design of centrifugal pumps for ultra-high-pressure injection duties
- **Find out** how to improve your critical machine 'up time'
- **Develop** your understanding about thermal spray coatings for fluid machinery

SILVER SPONSORS



SULZER



EXHIBITOR



SPONSORSHIP & EXHIBITION OPPORTUNITIES

GET INVOLVED

Attending this event as either an exhibitor or sponsor will give you the opportunity to display your solutions, services and products to the right people at the right time.

This is an excellent way to enhance your company profile and communicate effectively to your target audience.

BENEFITS OF SPONSORING

- Showcase new products
- Raise awareness of your operation
- Improve perception of your brand
- Influence other organisations' spending plans

For more information please call **+44 (0)20 7973 1309** or email sponsorship@imeche.org

PROGRAMME

DAY 1

MONDAY 6 OCTOBER 2014

09:00

REGISTRATION AND REFRESHMENTS

**TURBOMACHINERY
DEVELOPMENT**

SESSION 1

09:30

WELCOME AND INTRODUCTION
Ivor Rhodes, ACE Cranfield Ltd

09:40

KEYNOTE: A RETROSPECTIVE REVIEW OF SOME TROUBLESOME TURBINE BLADE FAILURES
Dr. Harrald Carrick, Prime Ltd

- A variable speed machine - 10MW steam turbine driving a recycle gas compressor
- A constant speed machine - two casings of an air compressor
- Measures adopted to prevent repetition

10:10

OPTIMISATION OF EFFICIENCY OF AXIAL FANS
Dr. Niels Kruyt, University of Twente, Pepijn Pennings, Delft University of Technology, Ruud Faasen, Vostermans Ventilation

- Design method
- Three-dimensional blade shape
- RANS-based CFD-simulations

10:35

CFD ANALYSES OF THE PULSATILE FLOWS IN A TWIN-ENTRY RADIAL TURBINE
Mahfoudh Cerdoun, Ecole Militaire Polytechnique, Adel Ghenaiet, University of Sciences and Technology

- Geometric modelling and grid generation
- Performance of a twin radial turbine under pulsating flow
- Analysis of volute/rotor/diffuser interactions

11:00

NETWORKING BREAK

**MECHANICAL
SEALING**

SESSION 2

11:30

API TYPE PRESSURISED DUAL SEALS - DESIGN CONFIGURATIONS FOR CONTAMINATED UPSTREAM PUMPING APPLICATIONS
Richard Jonathon Smith, AESSEAL PLC

- Performance comparison of differing configurations
- Barrier fluid pressures
- Seal Faces Optimisation

11:55

COUPLED MODELLING OF MECHANICAL SEAL FACES AND SECONDARY SEAL ASSEMBLIES
Dr. Christopher John Carmody, AESSEAL PLC

- Modelling techniques
- Design features
- Multi-physics models

12:20

NETWORKING LUNCH

**CENTRIFUGAL
PUMPS
OPERATIONAL
PROBLEMS
& SOLUTIONS**

SESSION 3

13:20

EXPERIMENTAL INVESTIGATION OF PRESSURE FLUCTUATIONS IN A HIGH-ENERGY CENTRIFUGAL PUMP STAGE AT OFF-DESIGN CONDITIONS
Dr. Stefan Berten, Sulzer Pumps Ltd, Mohamed Farhat, François Avellan, Laboratory for Hydraulic Machines, Philippe Dupont, Sulzer Pumps Ltd

- Rotor-Stator interaction in centrifugal pumps
- Experimental investigations
- Detection of flow separation

13:45

COATINGS HELP TO IMPROVE CENTRIFUGAL PUMP RELIABILITY
Vugar Mammadov, BP International, Ken Tacon, BP Exploration & Production Company Limited, Ben Davies, Sulzer Pumps, Natig Ahmedov, BP Exploration Caspian Sea Limited

- Reliability targets for centrifugal pumps
- Surface hardening treatments to improve pump service life
- Pump design and operating constraints

PROGRAMME

DAY 1 MONDAY 6 OCTOBER 2014

- 14:10 FIBRE REINFORCED CERAMIC BEARINGS FOR COOLING WATER PUMP APPLICATIONS**
Michael Peters, DOW Chemical
- Cooling water system
 - Operation pump problems
 - Fibre reinforced bearings

14:35 NETWORKING BREAK

SCREW COMPRESSORS DEVELOPMENT & OPERATION

SESSION 4

- 15:05 SCREW COMPRESSORS WITH VARIABLE GEOMETRY ROTORS - ANALYSIS OF DESIGNS BY CFD**
Professor Ahmed Kovacevic, Rane Sham, Nikola Stosic, City University London
- Grid generation for variable geometry screw rotors
 - Performance of compressors with various configurations
 - Pressure variations

- 15:30 A WORKING CONICAL SCREW COMPRESSOR**
Olly Dmitriev, Eugene Tabota, VERT Rotors
- Up to 22 bar (air) at 1000 rpm in a single stage
 - Principles of operation and test results
 - CAD software for automatic building of conical screws

- 15:55 DESIGN OF NEW SILENCERS FOR A SCREW COMPRESSOR**
Leonard Van Lier, Harry Korst, Jan Smeulers, TNO
- Pulsation analysis of compressor systems
 - Impact of variance in the gas composition
 - Field case; history and mitigation strategies

16:20 CHAIR'S CLOSING REMARKS

16:30 CLOSE OF DAY ONE

19:00 CONFERENCE DINNER

DAY 2 TUESDAY 7 OCTOBER 2014

08:30 REFRESHMENTS

09:00 CHAIR'S OPENING REMARKS
Ivor Rhodes, ACE Cranfield Ltd

FLUID MACHINERY MODELLING PART 1

SESSION 5

- 09:10 KEYNOTE: REVIEW AND STATE OF THE ART OF REGENERATIVE LIQUID RING PUMPS**
Nilla-Helene Donata Karlsen, George Athanasios Aggidis, Lancaster University
- Mathematical analysis
 - Computational modelling
 - Experimental testing

- 09:40 VIBRATION EFFECTS OF ENTRAPPED LIQUIDS**
Bert Koop, Siemens, Frits De Jongh, Turbocare
- Gas turbine driven centrifugal compressor units testing
 - Analysis and experimental verification
 - Influences of synchronous behaviour of entrapped oil

- 10:05 A CFD STUDY ON DESIGN PARAMETERS ACTING IN CAVITATION OF POSITIVE DISPLACEMENT PUMP**
Aldo Iannetti, Matthew Stickland, William Dempster, Strathclyde University
- Description of the problem, CFD model and adopted hypothesis
 - Discussion of the results obtained
 - Conclusion (discussion of the capability of CFD technique and future improvements)

10:30 NETWORKING BREAK

PROGRAMME

FLUID MACHINERY MODELLING PART 2

11:00

SESSION 6

THEORETICAL ANALYSIS TO CALCULATE AXIAL THRUST IN MULTISTAGE CENTRIFUGAL PUMPS

Abhishek Bhatia, ClydeUnion Pumps

- Axial thrust in multistage centrifugal pumps
- Rotor-Stator flow model
- Theoretical modelling and results

TURBOCOMPRESSOR OPERATION

11:25

SESSION 7

COMPARATIVE STUDY OF DIFFERENT EROSION MODELS IN AN EULERIAN-LAGRANGIAN FRAME USING OPENFOAM®

Alejandro López, Matthew Stickland, William Dempster, University of Strathclyde

- Erosion models
- Wear profiles
- Open source CFD package

11:50

NETWORKING LUNCH

13:00

SHELL LEMAN COMPRESSION UPGRADE PROJECT

Murray Forsyth, Shell UK Ltd, Pierpaolo Rocchi and Francesco Campanile, GE Oil and Gas

- Refurbishment/replacement of ageing or obsolescent topside equipment
- Equipment selection, specification and design
- Manufacture, testing, installation and pre-commissioning

13:25

GRONINGEN 2ND PHASE COMPRESSION PROJECT

Eunice Liow, Nederlandse Aardolie Maatschappij, Herbert Goorhuis, Shell Projects & Technology

- Double End Driven Compression train with Active Magnetic Bearings (AMBs)
- Pilot plant as demonstrator
- Risk assessment and development assurance program

13:50

DEVELOPMENT OF A REACTIVE SILENCER FOR TURBO COMPRESSORS

González Díez Néstor, Jan Smeulers, TNO

- Turbo compressors can generate tonal noise
- Principal mechanisms for the reduction of sound
- Silencer design and acoustic modelling

14:25

AGEING OF CENTRIFUGAL COMPRESSORS

Barry Hall, Dr. Aiyad Gannan, Altug Bilgic, Weir

- Managing equipment life cycle
- Inspection
- Compressor maintenance strategy

14:50

CHAIR'S CLOSING REMARKS

15:00

END OF CONFERENCE

Find out more about our speakers at www.imeche.org/events/C1395

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

ORGANISING COMMITTEE:

- **Ivor Rhodes**, ACE Cranfield
- **John Middleton**, Consultant
- **Dr. Harald Carrick**, Process Industry Machinery Expertise (PrIME)
- **Arie Aartsen**, ArtsenCrafts BV
- **Professor Ahmed Kovacevic**, City University London
- **Robert Brown**, Sulzer Pumps
- **Paul Hancock**, Aker Solutions
- **Frits de Jongh**, Turbocare (a Siemens company)
- **Jan Smeulers**, TNO Science and Industry
- **Pharic Smith**, Weir Engineering Services
- **Stephen Shaw**, AESSEAL (Group Engineering Director)
- **Simon Whatley**, Thames Water
- **Andrew Walker**, Sabic Europe

SPEAKERS AND CONTRIBUTORS A-Z

ABHISHEK BHATIA

CLYDEUNION PUMPS

ADEL GHENAIET

UNIVERSITY OF SCIENCES AND
TECHNOLOGY USTHB

PROFESSOR AHMED KOVACEVIC

CITY UNIVERSITY LONDON

DR. AIYAD GANNAN

WEIR

ALDO IANNETTI

STRATHCLYDE UNIVERSITY

ALEJANDRO LÓPEZ

STRATHCLYDE UNIVERSITY

ALTUG BILGIC

WEIR

BARRY HALL

WEIR

BEN DAVIES

SULZER PUMPS

BERT KOOP

SIEMENS

DR. CHRISTOPHER JOHN CARMODY

AESSEAL PLC

EUGENE TABOTA

VERT ROTORS

EUNICE LIOW

NEDERLANDSE AARDOLIE

FRANCESCO CAMPANILE

GE OIL AND GAS

FRANÇOIS AVELLAN

LABORATORY FOR HYDRAULIC MACHINES

FRITS DE JONGH

TURBOCARE

GEORGE ATHANASIOS AGGIDIS

LANCASTER UNIVERSITY

GONZÁLEZ DÍEZ NÉSTOR

TNO

GRAEME MURRAY FORSYTH

SHELL

DR. HARRALD CARRICK

PRIME LTD

HARRY KORST

TNO

HERBERT GOORHUIS

SHELL

IVOR RHODES

ACE CRANFIELD LTD

JAN SMEULERS

TNO

KEN TACON

BP EXPLORATION & PRODUCTION COMPANY
LIMITED

LEONARD VAN LIER

TNO

MAHFOUDH CERDOUN

ECOLE MILITAIRE POLYTECHNIQUE

MATTHEW STICKLAND

STRATHCLYDE UNIVERSITY

MICHAEL PETERS

DOW CHEMICAL

MOHAMED FARHAT

LABORATORY FOR HYDRAULIC MACHINES

MURRAY FORSYTH

SHELL

NATIG AHMEDOV

BP EXPLORATION CASPIAN SEA LIMITED

DR. NIELS KRUYT

UNIVERSITY OF TWENTE

NIKOLA STOSIC

CITY UNIVERSITY LONDON

NILLA-HELENE DONATA KARLSEN

LANCASTER UNIVERSITY

OLLY DMITRIEV

VERT ROTORS

PEPIJN PENNING

DELFT UNIVERSITY OF TECHNOLOGY

PIERPAOLO ROCCHI

GE OIL AND GAS

PHILIPPE DUPONT

SULZER PUMPS LTD

RANE SHAM

CITY UNIVERSITY LONDON

RICHARD JONATHON SMITH

AESSEAL PLC

RUUD FAASEN

VOSTERMANS VENTILATION

DR. STEFAN BERTEN

SULZER PUMPS LTD

VUGAR MAMMADOV

BP INTERNATIONAL

WILLIAM DEMPSTER

STRATHCLYDE UNIVERSITY

BOOKING FORM

CONFERENCE CODE:
C1395

**12TH EUROPEAN FLUID MACHINERY
CONGRESS**
6-7 OCTOBER 2014
WALDORF ASTORIA EDINBURGH -
THE CALEDONIAN, EDINBURGH EH1 2AB

REGISTRATION Please complete in capitals.

Family Name	Title (Mr, Mrs, Miss)
First Name	Job Title
Membership No	Institution
Name of Organisation (for name badge)	
Address for correspondence	
Town/City	
Postcode	
Contact Telephone	
Email	
Do you have any special requirements?	

How did you hear about this event? Direct mail Website Colleague Other

We would like to keep you informed of relevant services that may be of benefit to you. Please tick the boxes below to let us know what you're interested in:

- Events and training opportunities
 News and updates from the Institution
 Services and offers from our preferred partners

FEES AND CHARGES Please complete the appropriate box.

Registration fees include entry to the sessions, refreshments, lunch and a copy of the event proceedings.

	STANDARD RATE	VAT	TOTAL
Member, Institution of Mechanical Engineers	£599.00	£119.80	£719.70
Member, supporting organisation	£599.00	£119.80	£719.70
Non-member	£699.00	£139.80	£838.80
Student/retired	£375.00	£75.00	£450.00
Presenting authors	£445.00	£89.00	£534.00
Conference Dinner	£25.00	£5.00	£30.00

PAYMENT DETAILS

Payment must accompany this registration form. Registration will be confirmed only on receipt of full payment.

PLEASE INDICATE METHOD OF PAYMENT:

- Cheque** Cheques should be made payable to IMechE and crossed. Please note international delegates may pay only by credit card, BACS or banker's draft. A copy of the draft must accompany this form. It is the delegate's responsibility to pay any bank charges.
- Credit Card**
Card type: Visa MasterCard (please note we cannot accept American Express, Diners Club or Maestro)
Card No _____ Valid From _____ / _____ Expiry Date _____ / _____
Name of Cardholder _____
Billing Address of Cardholder (if different from above) _____
Postcode _____
Amount to be Deducted _____ Signature _____
- BACS** BACS bank transfers can be made to:
IMechE Current Account, NatWest Charing Cross Branch.
Sort Code: **60-40-05** Acc No: **00817767**
Swift Code: **NWBKGB2L** IBAN Code: **GB96NWBK60400500817767**
A copy of the draft must accompany this form.

- Invoice (UK residents only)** Delegates wishing to be invoiced must provide an order number. If your company does not use order numbers please include a formal request for invoicing on your company's letterhead. A charge of £10 +VAT will be made to cover additional administration costs. Invoices are payable on receipt and no alterations to these terms will be accepted.
- Order No _____
Contact Name _____
Name and Address for Invoicing _____
Postcode _____
Tel _____ Fax _____

FIVE WAYS TO BOOK

- 1 Online:
www.imeche.org/events/C1395
- 2 Email:
eventenquiries@imeche.org
- 3 Phone:
+44 (0)20 7973 1258
- 4 Post completed booking form to:
**Event Registrations
Institution of Mechanical Engineers
1 Birdcage Walk
London SW1H 9JJ**
- 5 Fax:
+44 (0)20 7222 9881

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.

SPECIAL REQUIREMENTS

Please inform us of any special requirements, ie. dietary or access, on the relevant section of this form.

CANCELLATION

For a refund (minus £25 +VAT admin charge), cancellations must be received at least 14 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 on the rescheduled date, they will receive a full refund of the fee paid.

The Institution is not responsible for any loss or damage as a result of a substitution, alteration or cancellation/postponement of an event. The Institution shall assume no liability whatsoever if this event is cancelled, rescheduled or postponed due to a fortuitous event, Act of God, unforeseen occurrence or any other event that renders performance of this conference impracticable, illegal or impossible. For purposes of this clause, a fortuitous event shall include, but not be limited to: war, fire, labour strike, extreme weather or other emergency.

Please note that while speakers and topics were confirmed at the time of publishing, circumstances beyond the control of the organisers may necessitate substitutions, alterations or cancellations of the speakers and/or topics. As such, the Institution reserves the right to alter or modify the advertised speakers and/or topics if necessary without any liability to you whatsoever. Any substitutions or alterations will be updated on the event's webpage as soon as possible.

LIABILITY

The organisers do not accept liability for any injuries or losses of any nature incurred by delegates and/or accompanying persons, nor for loss or damage to their luggage and/or personal belongings.

ACCOMMODATION

Via Corporate Team
<http://www.corporateteam.com/events/8488efm>

ENQUIRIES

For event enquiries please call
+44 (0)20 7973 1258 or email
eventenquiries@imeche.org

The Institution of Mechanical Engineers is a registered charity (no 206882)
VAT No GB299930493.

FORWARD THINKING

We are the market leader among professional engineering bodies. We've been supporting engineers since 1847 and have 100,000 members in over 120 countries, working in the world's most dynamic and important industries. Our comprehensive events programme brings you the latest research and best practice from industry and academia.

OTHER EVENTS TO LOOK FOR:

CAVITATION: THE ISSUES, CURRENT UNDERSTANDING AND FUTURE RESEARCH

16 September 2014
1 Birdcage Walk

Hear about the nature and extent of the cavitation problems encountered principally within the marine propulsion industry.

www.imeche.org/events/L6118

PUMP FUNDAMENTAL PART A WORKSHOP

17 September 2014
1 Birdcage Walk

This one-day course is designed to enable individuals with a general engineering or commercial background to gain an understanding of the principles associated with the pumping of liquids.

www.imeche.org/events/W1686

PUMP FUNDAMENTAL PART B WORKSHOP

18 September 2014
1 Birdcage Walk

You must have previously attended the Pump Fundamentals Part A before you attend part B. This course builds upon the fundamentals introduced in Part A and illustrates a procedure for evaluating enquiry data, making appropriate pump selections and on through to tendering.

www.imeche.org/events/W1687

If you're interested in any of these events, please contact our enquiries team on +44 (0)20 7973 1258 or email eventenquiries@imeche.org

FOLLOW OUR WEEKLY UPDATES
ON WWW.IMECHE.ORG

JOURNALS

Professional Engineering Publishing is the publisher for the Institution of Mechanical Engineers. For more information about our magazines, journals and conference proceedings visit www.uk.sagepub.com/imeche

You may be interested in:

Journal of Power and Energy (Proceedings of the Institution of Mechanical Engineers, Part A)

IMechE members benefit from a significant discount on this publication and others.

To find out more contact **Subscriptions** on +44 (0)1952 214050 or email subscriptions@imeche.org

Keep up your CPD

Continuing Professional Development (CPD)

As part of your professional registration and membership of the Institution of Mechanical Engineers and the Engineering Council, it's your responsibility to keep your skills up-to-date.

Our online Career Developer tool can help you:

- **Plan** Create an Action Plan and identify targets
- **Record** Download a record of your learning activities
- **Review** Reflect on your professional development

Register for Career Developer and get more from your career www.imeche.org/careerdeveloper

For tailored advice contact cpd@imeche.org

MEMBERSHIP

Whether you're a student, apprentice, graduate, qualified engineer or just have an interest in engineering, Institution membership offers the highest professional prestige. Professional registration is a valuable investment for any engineer who is serious about their career.

Find out which level you're best suited for at www.imeche.org/membership or email us on membership@imeche.org.

GET INVOLVED

Whether you're new to the profession or well established, volunteering is a great way to gain new skills, knowledge and experience. As an Ambassador you have the chance to represent your profession and give something back to the engineering community as well as inspiring the next generation.

See www.imeche.org/volunteering for more information or go to <http://nearyou.imeche.org> to find engineering events hosted by volunteers in your area.

Institution of
**MECHANICAL
ENGINEERS**

1 Birdcage Walk
Westminster
London
SW1H 9JJ

T +44 (0)20 7222 7899

www.imeche.org

Improving the world through engineering