

ABOUT THE COURSE

This course aims to provide a practical understanding of fatigue and fracture in components and structures and methods for assessing their structural integrity. Following a general introduction to fatigue and fracture, with examples of service failures, current and developing fatigue design and assessment methods will be described. The focus will be on joints, especially welds, the usual 'weak link' in most practical cases. The course will go on to explain the importance of crack/flaw analysis in structural design and safety assessment and illuminate its wide range of applicability. It will give a deep understanding of the major results and criteria underpinning modern fracture mechanics, the assumptions behind them and important limitations. Attendees will gain a better understanding of material selection for fatigue and fracture resistance and learn about codified procedures for flaw evaluation.

The syllabus will include: Case studies of service fatigue and fracture failures; Fatigue of plain and notched metals; Fatigue of joints (welded and mechanical); Fatigue design methods and new developments; Significance of welding flaws and their fatigue assessment, including by fracture mechanics; Industrial applications, including offshore structures, ships and pressure vessels; Review of theory of elasticity, cleavage, stress concentration and stress intensity; Linear elastic fracture mechanics: energy approach, energy release rate; Crack tip stress analysis, evaluation of stress intensity factor; Elasto-plastic fracture mechanics: the crack tip opening displacement, J integral;

The course is intended for practicing engineers who work with mechanical design, mechanics and structures as well as those involved in testing and equipment fabrication. This is also useful to those engaged in ship and offshore structure design and maintenance.

WHO SHOULD ATTEND

Engineers and scientists involved in the design, operation and assessment of both onshore and offshore structures and their associated equipment. Personnel from oil companies, consultancy organisations, classification

societies and certifying authorities will benefit from attending this course.

PROGRAMME

Monday 21 May 2012

08.30- 09.00	Delegate Registration
09.00- 10.30	Introduction to structural failure – Cases of service fatigue or fracture failure <i>Dr. Helena Polezhayeva</i>
10.30-10.45	Break
10.45-12.15	Introduction to fatigue of components and structures <i>Dr. Helena Polezhayeva</i>
12.15-13.45	Lunch
13.45-15.15	Fatigue design and assessment methods <i>Dr. Helena Polezhayeva</i>
15.15-15.30	Break
15.30-17.00	Problems & new developments in fatigue design and assessment of welded joints <i>Dr. Helena Polezhayeva</i>

Tuesday 22 May 2012

09.00-11.00	Practical application to fatigue design and assessment in offshore oil and gas industries <i>Dr. Helena Polezhayeva</i>
11.00-11.15	Break

11.15-12.45	Practical applications to Ship Structure <i>Dr. Lei Yu</i>
12.45-14.15	Lunch
14.15-15.30	Linear elastic fracture mechanics <i>Dr. Bostjan Bezensek</i>
15.30-15.45	Break
15.45-17.00	Elastic plastic fracture mechanics <i>Dr. Bostjan Bezensek</i>

Wednesday 23 May 2012

09.00 –10.15	Mechanism of fracture in actual material <i>Dr. Bostjan Bezensek</i>
10.15-10.30	Break
10.30- 11.45	Fracture mechanics concepts for crack growth <i>Dr. Bostjan Bezensek</i>
11.45-13.15	Lunch
13.15-14.45	Engineering critical assessment <i>Dr. Bostjan Bezensek</i>
14.45-15.00	Break
15.00-17.00	Practical application of fracture mechanics <i>Dr. Bostjan Bezensek</i>
17.00	Closure

REGISTRATION FORM

Name _____

(Please print)

Address _____

Telephone _____

Email _____

I wish to register for the Course at a cost of £650 + VAT (UK only) including course material and course lunches.

I enclose a cheque for £650 + VAT (UK only)

Please invoice me at the above address

Please send me information on local hotels

Disclaimer

All materials and information supplied during and associated with this course are intended purely for instructional purposes. Whilst every effort is taken to ensure that materials provided are accurate and suitable for training purposes, ASRANet Ltd accepts no responsibility for their accuracy or utility.

I accept the above.

Signature _____

Date _____

The completed form should be sent by **01 May 2012**
to:

ASRANet Ltd.

50 Richmond Street, Glasgow G1 1XP

Cost

The registration fee of the workshop will be £650+VAT (pound sterling) which includes course notes and lunches. You should make your own arrangements for accommodation.

For more information on accommodation in Glasgow please visit www.seeglasgow.com.

RINA

The Royal Institution of Naval Architects certifies that ASRANet Ltd. 'Fatigue & Fracture Analysis' training course meets the requirements for Continuing Professional Development of the Royal Institution of Naval Architects.

Venue

Corinthian
191 Ingram Street
Glasgow G1 1DA
Scotland, UK

Payment

Payments can be made by cheque (made payable to ASRANet Ltd.), cash or bank transfer. Please enquire for details.

Contact

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Fatigue & Fracture Analysis

21-23 May 2012



(A maritime spin-out company of the
Universities of Glasgow & Strathclyde)

Glasgow, UK

ABOUT THE AUTHORS

Dr Helena Polezhayeva

Helena obtained her BSc following by MSc in Static and Dynamic Analysis of Ship Structures and PhD in Fatigue of Ship Structures from Marine Technical University, St Petersburg, Russia. In 1994 she was awarded a Royal Society Fellowship for her Post-Doctoral research at Glasgow University.

Helena joined Lloyds Register in 1995; her current position is Principal Fatigue Specialist within London Design Support Office.

In her current role, Helena provides specialist advice on ship structural analysis and fatigue related issues internally to colleagues and externally when consulting with clients. She participates in the development of spectral fatigue analysis and fatigue assessment procedures for a wide variety of ship types. Helena also has responsibility for conducting experimental testing on both small and large-scale specimens, in addition to the development and delivery of fatigue training.

Her current affiliations include UK Engineering Council, Chartered Engineer, since 2001, Royal Institution of Naval Architects, Member, since 2001, International Institute of Welding, committee XIII, UK Fatigue Expert, since 2005, British Standard, member of the BS 7608 committee, since 2009.

Dr Bostjan Bezensek, Principal Engineer, Dipl. Ing., PhD, CEng Dr Bezensek holds an undergraduate degree in Mechanical Engineering from University of Maribor, Slovenia and a Doctor of Philosophy degree in fracture mechanics and failure assessment from University of Glasgow, Scotland, UK.

Dr Bezensek was a lecturer at the University of Glasgow, Department of Mechanical Engineering between 2005-2009 and has taught courses on materials, mechanics of solids and fracture mechanics to undergraduate students. He is presently the principal engineer at Hunting Energy Services (UK) Ltd who specialise in the premium connections for the oil & gas 'downstream' industry.

Dr Bezensek is recipient of several grants and awards from professional organisations and industry. In 2007 he was awarded the Japan Society for Promotion of Science post-doctoral grant and spent 6 months in Japan on sabbatical leave, collaborating closely with the Hitachi Research Laboratory, Hitachi Ltd on integrity of nuclear pipes with multiple flaws.

Dr Bezensek has been active in application of fracture mechanics to pipes and pressure vessels for over 10 years. He is an international authority on assessment of multiple flaws and regularly contributes to the international peer reviewed journals and to the ASME Pressure Vessels and Piping conference. In 2011 Dr Bezensek shall be the lead organiser of the Codes & Standards track in the aforementioned ASME conference.

In the last two years Dr. Bezensek became Chartered Engineer, a member of the ASME Boiler and Pressure vessel code Section XI working groups on Pipe flaw evaluation and on Flaw evaluation and a member of the British Standard's BS7910 committee WEE37 and sub-committee on fracture. He also contributes to the R6 fitness-for-service code.

Lei Yu obtained his M.Sc with Honours in Naval Architecture from Dalian University of Technology in China in 1998. He joined Lloyd's Register in 2001 as a specialist working on software development of ShipRight SDA and FDA, the flagship products used in plan approval and consultancy services. He gained his seniority in 2005. He was transferred to his current position of Engineering Software Support and Training Manager in 2007, responsible for developing training packages and providing user support for engineering software products. He obtained his Ph.D degree from the University of Glasgow in 2010 for his work '+Fatigue Reliability of Ship Structures'.