A two-day short course on

Oilfield Corrosion Science and Engineering

Tuesday 19 – Wednesday 20 May 2020
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Learning outcomes
On completion of this course, you will:
- be familiar with the two main aqueous internal pipeline degradation mechanisms in oil and gas production: carbon dioxide (CO₂) and hydrogen sulphide (H₂S) corrosion.
- have covered the theory of aqueous corrosion and understand the components of an electrochemical cell for corrosion testing.
- know how to implement various AC and DC electrochemical techniques.
- have learnt about the complexities and challenges associated with material selection and corrosion inhibition in the oil and gas sector from two industry guest speakers.
- understand the various internal pipeline degradation mechanisms which result in general and localised corrosion, achieved through a combination of demonstration tours and talks.
- have developed an appreciation for the different types of laboratory equipment, testing methodologies and in situ/ex situ techniques for modelling/understanding specific degradation mechanisms and/or evaluating corrosion inhibitor performance.
- understand how laboratory methods can be best linked to the field.

How will I benefit?
This course will provide you with an introduction into the numerous corrosion threats associated with internal pipeline degradation within the oil and gas industry. Our academic speakers will cover the details relating to specific mechanisms. Industrial guest speakers will provide you with an insight into the two main corrosion control methods relating to internal corrosion: corrosion inhibitors and material selection/optimisation. Practical interactive sessions will then help you to understand how to set up electrochemical cells for corrosion measurement, whilst also covering how such systems work.

You will also benefit from learning how to acquire and interpret various electrochemical responses from such cells, helping you to identify appropriate materials and/or inhibitors for a particular application.

Finally, demonstration tours will show you how various field scenarios/mechanisms can be modelled in a laboratory environment to understand corrosion threats, as well as evaluate materials and inhibitors in different processes.

Course structure
A two-day theoretical and technical course involving demonstrations, theory and hands-on interactive sessions covered by experienced academics and renowned industry guest speakers. Our guest speakers include Prof. Bijan Kermani (KeyTech and University of Leeds Visiting Professor), who on day one, will provide a talk on corrosion management and material selection in the oil and gas sector. Following this, on day two, our second guest speaker, Mr Trevor Hughes (Schlumberger) will deliver a talk on chemical inhibition in oil and gas systems.

Who should attend?
This course is suitable for you if you:
- work in oil and gas operations as a process, mechanical, materials engineer etc., who has recently become involved in corrosion management.
- are an academic who wishes to understand the latest challenges in the oil and gas industry, as well as the electrochemical methods used to evaluate materials/chemicals in corrosive environments.
- work as part of a service company in the development of corrosion inhibitors.
- are involved in asset integrity, management of operations or flow assurance within the oil and gas sector.
- are a design and/or maintenance engineer or technical staff involved in both offshore and onshore oil and gas activities.
- are scientists or chemical engineers who would value a deeper understanding of how corrosion science and theory can be applied to better understand and solve real industrial corrosion problems.
- are engineers or designers involved in the production and supply of metals and alloys for oilfield corrosion environments.

Course director
Dr Richard Barker
Institute of Functional Surfaces (IFS)
School of Mechanical Engineering

Course co-director
Dr Wassim Taleb
Institute of Functional Surfaces (IFS)
School of Mechanical Engineering

Day one
Tuesday 19 May 2020
08:30 Registration and coffee
09:00 Course introduction

Corrosion fundamentals and CO₂ corrosion
09:15 Aqueous Corrosion Theory
Professor Anne Neville
School of Mechanical Engineering, University of Leeds
10:00 CO₂ corrosion
Dr Richard Barker
School of Mechanical Engineering, University of Leeds
10:45 Coffee

Interactive electrochemistry session
11:00 Interactive Session 1: Acquisition and interpretation of electrochemical measurements – part 1
Dr Richard Barker
13:00 Lunch

Guest speaker and demonstration tour
13:45 Materials optimisation and corrosion management in hydrocarbon production
Professor Bijan Kermani, Guest speaker
KeyTech and visiting Professor of University of Leeds
14:45 Demonstration tour – Simulating/modelling corrosion processes in the laboratory
Dr Yong Hua, Dr Joshua Owen, Dr Adriana Matamoros Veloz
School of Mechanical Engineering, University of Leeds
15:45 Tea/Coffee

Corrosion mechanisms: part 1
16:00 Synergies between mechanical effects and corrosion
Dr Michael Bryant, School of Mechanical Engineering, University of Leeds
16:30 Pitting corrosion in active and passive materials
Dr Frederick Pessu, School of Mechanical Engineering, University of Leeds
17:00 Question session followed by end of day one
19:00 Course dinner

Day two
Wednesday 20 May 2020
08:45 Coffee/tea

H₂S corrosion fundamentals and microbial corrosion
09:15 Corrosion testing - linking laboratory measurements to the field – theory, challenges and best practices
Dr Daniel Burke, LLBC Baskerville
10:00 H₂S corrosion
Dr Frederick Pessu, School of Mechanical Engineering, University of Leeds
10:45 Coffee

Interactive electrochemistry session
11:00 Interactive Session 2: Acquisition and interpretation of electrochemical measurements – part 2
Dr Richard Barker
13:00 Lunch

Guest speaker and demonstration tour
13:45 Chemical inhibition in acidizing treatment and hydrocarbon production environments
Mr Trevor Hughes, Guest speaker
Schlumberger Cambridge Research
14:45 Demonstration tour – Systems and techniques for inhibitor evaluation
Dr Yong Hua, Dr Joshua Owen, Dr Adriana Matamoros Veloz
School of Mechanical Engineering, University of Leeds
15:45 Tea/Coffee

Corrosion mechanisms: part 2
16:00 Microbial corrosion
Dr Wassim Taleb, School of Mechanical Engineering, University of Leeds
16:30 Galvanic corrosion
Professor Anne Neville, School of Mechanical Engineering, University of Leeds
17:00 Question session followed by end of course

The full course details and online booking are now available from the course web page: http://eps.leeds.ac.uk/short-courses

"This is a great course that gives a solid grounding for the developing corrosion scientist/engineer.”
Baker Hughes

"All subjects and interactive sessions very interesting. I would definitely recommend.”
Schlumberger
Further details

Venue
The venue for the course will be the School of Mechanical Engineering, University of Leeds, Leeds LS2 9JT.

Course fees
The following course fees are VAT exempt and include the cost of tuition, course materials, lunches, light refreshments and the course dinner:
Tuesday 19 – Wednesday 20 May 2020 £800

Accommodation
Delegates are responsible for their own accommodation, if required. A list of hotels close to the University will be sent out with the delegate joining instructions.

Course dinner
The course dinner will take place at a Leeds city centre restaurant on Tuesday evening and is included in the course fee. Delegates are responsible for making their own way to and from the restaurant and the dress code is smart casual.

How to book
Booking for this course should be completed through our secure Online Store using debit or credit card. To complete your booking please follow the instructions below:

Online booking
1. Log on to our online store at https://store.leeds.ac.uk
2. Select Conferences and Events in the left-hand navigation bar.
3. Select CPD Faculty of Engineering and Physical Sciences
4. Select the course or event for which you wish to register and click on ‘Book’
5. If you are a new user, please follow the instructions to register. If you already have an account log in as instructed.
6. Complete the application process as directed by the booking system.

You will receive an automatic confirmation email within 24 hours of your booking.

Our privacy notice tells you what to expect us to do with your personal information when you make contact with us or use one of our services: https://eps.leeds.ac.uk/privacy

For online booking queries and for all other enquiries please contact:
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Terms and conditions for booking
Payment in full should accompany your booking. The course fee is exempt from VAT. Fees must be paid in full no later than 15 working days before the course commences. Failure to pay may result in attendance being refused. Registrations are accepted on the understanding that the printed programme is given in good faith but may have to be re-scheduled or the speakers changed for reasons outside our control. The University of Leeds reserves the right to cancel or postpone the course, in which case fees will be refunded in full. In the event of cancellation, the University will not be held liable for delegates travel or accommodation expenses. Delegates will receive a full refund for cancellations made within 7 days of online booking, except where the booking has been made for an event commencing within the next 7 days. Where a delegate wishes to cancel a registration after this 7 day period, written cancellations received up to 15 working days before the course will be subject to an administrative charge of 20% of the total remittance. After this date the full fee is chargeable and no refunds will be made, this also applies for non-attendance but copies of the course documents will be sent. Substitutions may be made at any time. If you are unable to complete your registration using the online booking system please contact the CPD, Conference & Events Unit to discuss alternative arrangements. The CPD Unit take your privacy seriously and we will only use your information to provide information on our CPD courses and relevant engineering events. We will not pass your details to any other organisations. If you have opted in to receive details of future CPD courses from us you can unsubscribe at any time by emailing us at cpd@engineering.leeds.ac.uk and your details will be removed from our database.