

# An Introduction to Materials & Corrosion

## An Awareness Course

**27<sup>th</sup> - 28<sup>th</sup> March 2012**

Ibis Hotel, Murray Street, Perth  
Western Australia

This two-day course has been specifically designed for people new to subsea or unfamiliar with the various corrosion considerations which need to be applied during design, construction and operation of subsea assets.

The aim of this course is to provide an overview of the various materials and corrosion issues which are applicable to subsea structures. The choices made which impact one area of corrosion and integrity will often impact the choices in other areas, and also affect the long term inspection and monitoring which may be required to ensure the design life is met. Having a general overview of the interaction between the various factors and the impact that certain choices make and the equipment used in inspecting and monitoring the structures will provide attendees with a broad knowledge on the interaction which needs to be considered in any installation.

The course will be presented by experienced personnel from both the supply and subsea industries. The course will be held in a classroom environment, with the session being interactive, with every opportunity to ask questions and discuss the material presented.

## PROGRAMME:

### DAY ONE

Tuesday 27th March 2012

08:30 Registration and Coffee

#### 08:45 Introduction - Grahame Strong, WGIM

Grahame will introduce the course by providing an overview of corrosion issues affecting subsea structures and setting the scene for the presentations to follow. He will cover the basic operating conditions for equipment (both internally and externally), basic design requirements and design considerations including costs etc. He will introduce the basic mechanisms of corrosion, and discuss the effects of elevated temperatures, CO<sub>2</sub>, H<sub>2</sub>S, sand, seabed topography and choice of material etc, on the rate of corrosion. To assist with the learning experience, Grahame will also outline a series of questions that the attendee should be able to answer at the end of the 2 day course.

#### 09:30 Corrosion and Erosion Monitoring Equipment

David Breakey, Teledyne Oil & Gas

Andrew will address the type of equipment which is available for monitoring of corrosion and erosion of subsea assets. This will include equipment such as sand monitors (acoustic and probes), LPR probes, ER probes, RPCM, CEION probes etc. Included in this presentation will be the interfaces between subsea and topside equipment and the communication options which are available.

11:00 Coffee / Tea

#### 11:15 Corrosion & Erosion Modelling

Chris Selman, WGIM

Andrew will discuss the various models which are available to model the effects of CO<sub>2</sub>, H<sub>2</sub>S and sand production on the internals of pipelines. He will compare the models, the information required for input and the advantages/disadvantages/limitations of each. These models are used to determine the corrosion allowance and the requirement for more exotic (corrosion resistant) pipeline materials in certain applications.

12:45 Lunch

#### 13:30 Manufacturing of linepipe

Masahiko Hamada & Tsuyoshi Miki, Sumitomo, Japan

Sumitomo will discuss the manufacture and welding of linepipe including carbon steel and corrosion resistant alloys. The presentation will address certain types of steel and their manufacture into linepipe and the characteristics of the materials.

14:45 Coffee/Tea

#### 15:00 Manufacturing linepipe cont.

#### 16:00 Specification, Fabrication and Welding

Niekie Joosten, WeldNet

This presentation will cover the materials used in subsea installations and the issues related to welding them together. The types of welds, heat treatment, metallurgy of the welds, limitations imposed on welding offshore pipelines (on barges etc) and testing welds. A will also be provided to the same fabrication in an onshore environment.

17:30 Classroom Day End

18:00 Course Dinner - Venue to be advised

### DAY TWO

Wednesday 28th March 2012

08:45 Coffee/Tea

#### 09:00 Chemical Selection, Injection and Inhibition

Steven Davoren, NALCO

Steven will discuss the types of inhibitors which are available for application into oil & gas subsea production systems. Topics will include selection and qualification of inhibitors for systems utilising subsea injection via chemical umbilicals and systems utilising continuous MEG for hydrate control. Other challenges such as top of line corrosion management and downstream process impacts for using corrosion inhibitors will also be provided.

10:30 Coffee / Tea Break

#### 10:50 Cathodic Protection and Coatings

John Grapiglia, CCE

John will cover the codes and standards which are used in the design of cathodic protection systems, the important factors which affect the performance of CP systems and a general overview on the issues related to CP and the interaction with coating systems.

12:30 Lunch

#### 13:15 Operational Integrity and FFS

Neil Pain, Rosen

Harry will discuss pipeline pigging, codes and standards for defect assessment, types of pigs available, their benefits, the type of data which can be collected and limitations affecting intelligent pigging, and pipeline design. It will include how the data is processed and what information is available from the intelligent pigging of pipelines.

14:45 Coffee / Tea

#### 15:05 Planning and Implementation of Inspection & Monitoring

DiedeRick Naude, Applus Rtd

This presentation will cover the issues which affect subsea structures and the type of inspection which are performed. It will include ROV inspections, ROV types, tooling, ROV capabilities and regulatory requirements for inspections. The data ideally required to be made available to the inspection company to thoroughly perform the inspections will be discussed as well as other testing/inspection which may be performed by other forms of inspection (such as divers etc).

16:35 Wrap up.

16:45 Course End.



SUT would like to thank the following companies for their support of this course.



## Materials and Corrosion 27th & 28th March 2012

**Venue:** Ibis Hotel (Pepper Room), Murray Street, Perth, Western Australia 6000

**Course Dinner:** venue will be advised along with delegate joining instructions.

**Joining Instructions** Joining instructions will be e-mailed to each registered delegate.

### Registration Fees

SUT Members - \$1050.00 + GST = \$1155.00

Non Member - \$1260.00 + GST = \$1386.00

**Fee includes** - Lunch, tea/coffee on both days & dinner on 27th, a CD containing pdf copies of the presentations, hard copy delegate handout notes are all included.

### Preferred Payment Methods:

**Credit Card:** AMEX\*, Mastercard or Visa ONLY. We cannot accept payment by any other card.

**\* Payments made by AMEX will attract a 2.75% surcharge.**

**Cheque:** Australian Dollar only, made payable to The Society for Underwater Technology

Send to, PO Box 7284, Cloisters Square, Perth, WA, 6850

Please make sure you reserve a place by e-mail or fax before posting your cheque.

**Invoice:** Please provide PO. No.

**Cancellations:** Refunds will be made on written cancellations received up to 10 working days prior to the event but will be subject to a 15% handling charge. 50% will be deducted 5 working days in advance and 100% thereafter up to the start of the event. No refund will be given for non-attendance. Delegates may nominate a substitute in their place.

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## Registration Form

Please e-mail completed form to [Perthevents@sut.org](mailto:Perthevents@sut.org) or fax to + 61 (0) 8 9446 9905

Please tick to indicate your preferred payment method: SUT Member No. \_\_\_\_\_

Credit Card \_\_\_\_\_ (Visa, MasterCard or AMEX \*) Cheque \_\_\_\_\_ Invoice (PO No.) \_\_\_\_\_

Please tick appropriate box.

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

Phone no. \_\_\_\_\_ E-mail address (s) \_\_\_\_\_

Credit Card No: VISA or MASTER CARD ONLY. \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_

Exp. \_\_\_\_\_ / \_\_\_\_\_ Security no \_\_\_\_\_ (last 3 digits on the back of your card)

Name on the card \_\_\_\_\_

Billing Address if not as above \_\_\_\_\_

Amount to be charged \$ \_\_\_\_\_ Signature \_\_\_\_\_

E-mail address where receipt for credit card payment should be sent \_\_\_\_\_

For further information on this event, please contact Joyce Bremner [J.bremner@sut.org](mailto:J.bremner@sut.org) Tel: + 61 (8) 9446 9903

To register, please e-mail completed registration form to [perthevents@sut.org](mailto:perthevents@sut.org) or fax the completed form to + 61 (8) 9446 9905