

# Achieving Reliable Subsea Systems

27 March 2019

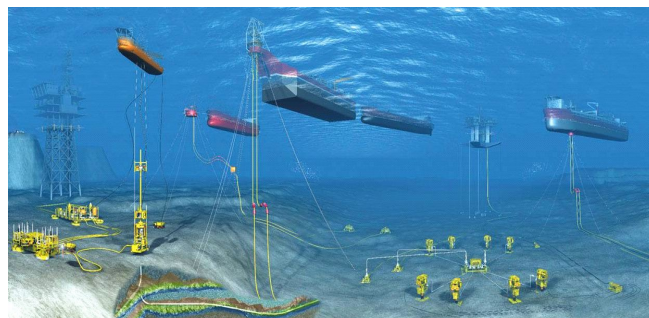
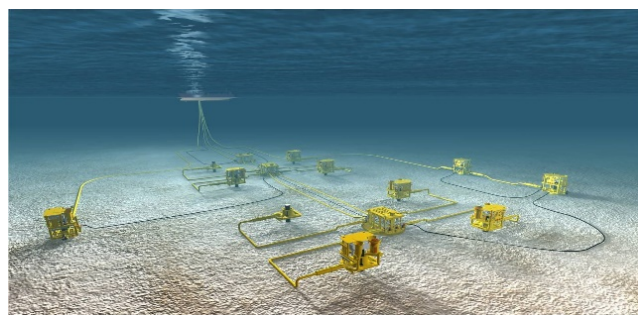
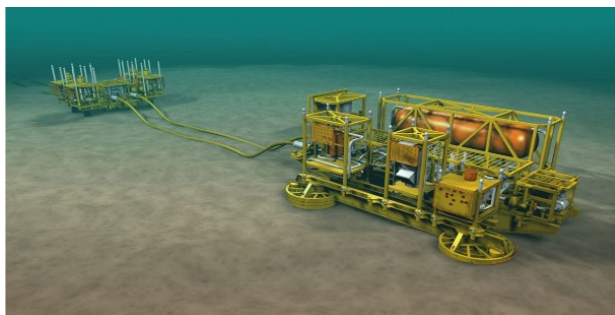
Saxons Training Facilities  
1/140 St Georges Terrace, Perth

Are you surprised by how often we experience unexpected subsea failures? Are you striving for higher subsea production system reliability? If so, then this is the course for you!

## What the Course will Deliver:

- ◆ Overview of Subsea Reliability
- ◆ Framework for achieving reliability targets
- ◆ Interfaces with Subsea Integrity and Project Management
- ◆ Contracting Strategies for Reliability
- ◆ Key Decisions to be made
- ◆ Tools and Methods
- ◆ Industry Best Practice (New codes/stds.)
- ◆ What happens if you get it wrong
- ◆ Economic Benefits of getting it right
- ◆ Turning Lessons Learned into Improvements

**Who would benefit from attending this course:** Project Managers, Quality/Integrity Personnel, Reliability Specialists, Subsea Systems Engineers, Subsea Discipline/Package Engineers, Subsea Pipeline Engineers, Subsea Operations Personnel, Subsea Equipment Vendors



*Pictures courtesy of FMC Technologies Australia*

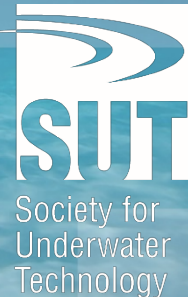
Thank you to our presenting companies:



# Achieving Reliable Subsea Systems

15<sup>th</sup> February 2017

Cliftons — Parmelia House  
191 St Georges Tce, Perth



## PROGRAMME

08.15 Registration

08.25 SUT & delegate introduction

08.30 Welcome, Introduction Reliability Aims and Importance

*Alex Ham, Wood Group*

- ◆ What do we mean by Subsea Systems Reliability and why is it important?
- ◆ What causes Subsea Unreliability and where do we need to focus?
- ◆ How will this course help you improve Subsea Reliability?

08.50 Framework for Subsea Reliability and Technical Management

*Karl Woods, Woodside Energy Ltd.*

- ◆ Key terms and definitions
- ◆ Objectives of a reliability strategy
- ◆ Overview of API RP 17N Reliability Management Framework
- ◆ Organisational models to enhance reliability management capability

10.00 Coffee/Tea

10.15 Economics of Reliability and Operability

*Ross Hendricks, TechnipFMC*

- ◆ Project Failure Statistics
- ◆ Economic Impact of Reliability & Availability
- ◆ Operability—Impact on Production Availability
- ◆ System Design to achieve desired Operability /Availability
- ◆ Impact of System Design - successful & not so successful examples
- ◆ The significance of contracting strategies in achieving reliable cost effective project outcomes

11.30 Reliability Modelling (RAM) / Basic Probability Theory

*Mark Mackenzie, K2 Technology Pty. Ltd.*

- ◆ Reliability models and how they relate to what we do
- ◆ Some commonly used reliability models
- ◆ Understand how the models work and when they are useful
- ◆ Models outputs
- ◆ What is required to build reliability models
- ◆ What is probability
- ◆ Why you need to know this
- ◆ Standard definitions used in reliability engineering
- ◆ Statistics and distributions to analysis reliability
- ◆ Limitations of calculation—Prediction no Perfection

12.45 Lunch

13.45 Tools and Techniques

*Iain Moir, Vanguard Solutions Pty Ltd*

- ◆ Reliability Tools and the Design Stages
- ◆ FMEA & FMECAS
- ◆ Event Trees (ETA) - Fault Tree Analysis (FTA)
- ◆ RAPTOR demonstration (useful lessons about modelling Reliability Block Diagrams, Availability and the benefits of Redundancy)

14.30 Workshop

*Kevin Mullen, Consultant &  
Iain Moir, Vanguard Solutions Pty Ltd*

The class will be given a simple subsea system to actuate a valve. They will be then split into groups, each group will tackle a specific task to analyse using different reliability tools eg. Fault Tree and RBD.

15.15 Coffee/Tea

15.30 Workshop presentations

16.00 Reality of Reliability

*Kevin Ingram Chevron*

- ◆ Data collection, reduction and validity.
- ◆ Systemic failures. Failure when everything is done 'well'
- ◆ Effects of low reliability - examples
- ◆ Inertia of organisations, Hidden benefits of reliability,
- ◆ What is typically achieved, system
- ◆ Design—accommodation of Reality

17.00 Certification and Course Conclusion

*SUT reserves the right to change/amend the programme as it see fit.*

# Registration Information

Achieving Reliable Subsea Systems March 2019

For further information or to register, please contact Patricia Slapp on [p.slapp@sut.org](mailto:p.slapp@sut.org) or Tel +61 8 9481 0999.



## Registration Fees

<b>SUT Members Early Bird (register and pay before 18<sup>th</sup> Jan)</b>	<b>\$420.00 + GST = \$462.00</b>
SUT Members (registration after 18 <sup>th</sup> Jan)	\$477.27 + GST = \$525.00
<b>Non Members Early Bird (register and pay before 18<sup>th</sup> Jan)</b>	<b>\$495.45 + GST = \$545.00</b>
Non Members (registration after 18 <sup>th</sup> Jan)	\$563.64 + GST = \$620.00
SUT Student Member	\$172.73 + GST = \$190.00 – <i>limited places available</i>

**Fee includes** - All refreshments and an electronic copy of the available presentations and videos are provided.

**Not included** - Hard copy presentations are not provided. Should these be required there is an additional fee of \$55.

## Preferred Payment Methods:

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

\* Payment by Visa or MasterCard will carry a 1.5% surcharge / AMEX will carry a 2.75% surcharge.

**Invoice:** Please tick here to be invoiced ☐

## Joining Instructions:

Joining instructions will be e-mailed to the registered delegate (as shown on the registration form). All details of presenters and updates to the programme will be included in the joining instructions. Please bring along a laptop to view the presentations.

## Transport During the Course:

Delegates are responsible for their own travel arrangements at the beginning and end of each day.

**Cancellations:** Refunds will be made on written cancellation received up to ten working days prior to the event, but will be subject to a 15% administration charge. Cancellations received 9–4 working days prior to the event will be charged a 50% cancellation fee. Cancellations received 3–0 working days prior to the event will not be refunded. Delegates may wish to nominate a substitute in their place at no charge.

**CPD Hours:** CPD hours can be claimed for this course, please keep flyer and receipt for auditing purposes.

Please tick box if you do not wish to receive further SUT information ☐

## Registration Form

Please e-mail completed form to [p.slapp@sut.org](mailto:p.slapp@sut.org)

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

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

Name \_\_\_\_\_ Please tick here if personally funding course ☐

Company \_\_\_\_\_

Address \_\_\_\_\_

E-mail address \_\_\_\_\_ Tel No. \_\_\_\_\_

Credit Card No: VISA, MASTERCARD or AMEX ONLY \* \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_

Exp. \_\_\_\_\_ / \_\_\_\_\_ Security no \_\_\_\_\_ (3 digit number for visa & m/c, 4 digit number for amex)

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

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

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

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