

Subsea Processing

Emerging, Enabling, Even Game Changing?

One-day Seminar

25th February 2010

Swan Room, Parmelia Hilton Hotel, Mill Street, Perth

What does subsea processing mean to you - is it just metering and boosting or can you envisage separation and even compression? Can you reconcile your views with a forecast spend of \$3.4 to 5 billion on subsea processing systems over the next 5 years?

How familiar are you with the potential that subsea processing has to offer to your project? Does it assist purely with the flow assurance challenges associated with subsea production or are the benefits from improved recovery and increased production persuading operators to consider this relatively novel technology?

What is the readiness of subsea processing technology? What are its benefits versus the barriers to use? What about the installation and maintenance requirements and considerations of reliability? How do these concerns relate to developments in the supply of subsea power and techniques for control and monitoring of the subsea processing systems?

This seminar will provide you with:

- the history of the development of subsea processing;
- an appreciation of the breadth of the unit operations involved and their current status;
- case studies; and
- a view of the future, hopefully inspiring you to include subsea processing in your list of potential development options for your next subsea development.

PROGRAMME

09.00 Registration & Coffee

09.15 **Welcome and Introduction**

Seminar Aims

09.30 **Why Subsea Processing**

10.00 **The History of Subsea Processing**

Jeremy Thomson, Schlumberger

The drivers for subsea processing are clear but how did we get to where we are today, and where are we going to the future.

10.35 *Tea/Coffee*

10.55 **Subsea Processing - Ongoing Projects and Developments**

Ove Fritz Jahnsen, FMC Technologies

FMC Technologies is currently supplying subsea processing equipment to several projects worldwide. Among these are Gas/Liquid separation and boosting on Pazflor in Angola, BC-10 in Brazil and Perdido in the Gulf of Mexico. In addition, they have supplied a 3 phase Subsea Separation, Boosting and Injection system for the Tordis field in the North Sea and are currently working on a separation system for the Marlim development in Brazil. A brief overview of the technological challenges for these projects will be presented, together with the proposed solutions and qualified technology utilized. Recent developments within Subsea Processing will also be discussed.

11.30 **An Update on Subsea Active Production Technology**

Tim Turner, INTECSEA

With discovery of oil and gas in ultra deep reservoirs and in deepwater, flow assurance challenges are numerous. Subsea Active Production Technology (SAPT) including Direct Electrical Heating, Subsea Separation, Subsea Water Injection and Subsea Boosting is becoming an enabler technology rather than enhancing. This paper will highlight operational history and an update on the current state of the art based on findings from JIP study and ongoing projects.

12.05 **Multiple Application Re-Injection Systems (MARS)**

Ian Donald, DES Operations Limited

This paper will outline the proven benefits of adopting MARS technology to increase recoverable reserves and profitability while highlighting ongoing operational experience being gained in the Gulf of Mexico, West Africa and the North Sea.

12.40 Lunch

13.40 **Compact Gas/Liquid Separator**

Chong Wong, CSIRO

CSIRO is developing in conjunction with Chevron Energy Technology a novel patented compact gas-liquid separator. The separator has been designed to be scalable for don-hole, sub-sea and land based operations. First trial applications are planned for land operation and then scaled for sub-sea with the final goal to have a down-hole gas-liquid separator.

14.15 **Subsea Processing - An Operators View**

Paul Jones, Chevron Energy Technology Pty Ltd.

Chevron began working on Subsea Processing in 1997 and in 2000 predicted that a 1500m water depth capable full processing system could be installed by 2006. Yet by the end of the decade this milestone had not been reached, and a 2009 OTC paper still described subsea processing as "having a promising future". In this presentation we will examine system designs and capabilities, why the early opportunities identified for Subsea processing did not mature, and how subsea processing needs to evolve for more widespread application.

14.50 **Subsea compression: A challenge for turbomachinery technology**

Massimo Camatti & Giuseppe Vannini, GE Oil & Gas

GE have developed a high performance electrically driven gas compressor specifically designed for subsea operation and the first full scale prototype is now ready for testing. This paper will present the conceptual approach GE has taken to define the product critical requirements and the technologies developed and validated from component up to machine system level to design and build the first unit. It will also describe the future perspectives of developments to make subsea compression a specific and unique branch of machinery technology.

15.25 *Tea/Coffee*

15.45 **An Update To The State-Of-The-Art Technology**

Mads Hjelmeland, Framo Engineering

Framos presentation will provide an update and overview of the different pump technologies available, and as implemented in the world's first subsea processing systems; Troll Pilot, Tordis and Pazflor field developments including Multiphase Hybrid, Hi-Boost and Single Phase Subsea Pumps.

16.20 **A Look to the future**

Dr. Julie EP Morgan, Woodside Energy Ltd

16.55 Networking over drinks & canapés

18.00 Day End

Registration Information

(Subsea Processing Feb 2010)

Should you require further information on this event, please contact Joyce Bremner on j.bremner@sut.org
To register, either e-mail the information required on the registration form to perthevents@sut.org
or fax the completed form to +61 8 9446 9905

Registration Fees

SUT Members - \$ 250.00 Inc. GST

Non Members - \$ 300.00 Inc. GST

Fee includes - All refreshments, lunch, networking drinks & canapés

Preferred Payment Methods:

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

*Please note if paying by AMEX there will be a 2.75% surcharge.

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

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

Please make sure you reserve a place by e-mail or fax before sending payment.

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.

Cancellations:

Refunds will be made on written cancellation received up to ten working days in advance of the event, but will be subject to a 15% handling charge. 50% will be deducted up to three working days in advance and 100% thereafter up to the start of the event. No refund will be given for non-attendance. Delegates may wish to nominate a substitute in their place.

Transport:

Delegates are responsible for their own travel arrangements to and from the Parmelia Hilton Hotel.

Registration Form

Please e-mail details to Perthevents@sut.org or fax the completed form to +61 8 9446.9905

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