



Multiphase Pump Training Course

Tuesday 29th June 2004

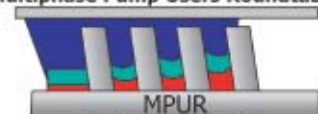
Advances in Multiphase Separation and Multiphase Pumping Technologies Conference

Wednesday 30th June - Thursday 1st July 2004

Airport Thistle Hotel, Aberdeen, UK

Organised by
NEL, EAST KILBRIDE, GLASGOW, UK
BOOKING HOTLINE: +44 (0)1355 272858

Multiphase Pump Users Roundtable



Texas A&M University

Advances in Multiphase Separation and Multiphase Pumping Technologies Conference

30 June - 1 July 2004
Airport Thistle Hotel
Aberdeen



Introduction

In order to squeeze the last drops of oil from maturing fields and to make the development of marginal fields economically viable, optimisation of production separation, application of subsea processing as well as pressure boosting using multiphase pumping technologies are often considered to offer solutions.

Following the successful organisation of NEL's Produced Water and Oil-in-Water Monitoring Workshops NEL is planning its first conference on "Advances in Multiphase Separation and Multiphase Pumping Technologies" to be held in Aberdeen on 30 June and 1 July 2004.

Conference Objectives

The objective of the Conference is for interested parties to find out and to keep abreast of the latest technological developments as well as current practices and trend in production separation systems and multiphase pumping technologies.

Topics and Themes

The event will cover:

- Multiphase separator design - theory / fundamental
- Multiphase separation optimisation / debottlenecking
- Compact separator design & applications
- Subsea separation and processing
- Key instrumentation - interface level measurement and separation profiling
- Multiphase pumping and pressure boosting
- Field operational experiences
- Open discussion

Speakers from offshore operators, service companies, leading technology and equipment suppliers as well as consultancy and R&D organisation will present.

Multiphase Pump Training Course

The conference will be preceded by a one-day training course on multiphase pumping technologies on 29 June 2004.

Further details can be found overleaf.

Who Should Attend

The event is designed for those who are concerned with offshore oil and gas production processing, in particular multiphase separation, subsea technologies, multiphase phase pumping & pressure boosting, process optimisation. It is also designed for those who supply technologies and services to offshore oil and gas production. It is aimed at:

- Production engineers and chemists
- Facility operation engineers and advisers
- Process engineers
- Consultants
- Researchers

Workshop Discussion Periods

There will be several open discussion periods concentrating respectively on:

- Current production separation systems coping with maturing assets / fields
- Key instruments and their roles in production separation optimization
- Multiphase pumping / pressure boosting – economic benefits and risks
- Subsea processing – what are the obstacles

TUV NEL Ltd

NEL is one of Europe's leading engineering technology services organisations.

NEL has an international reputation in key engineering areas; a world class profile based on 50 years of solid achievement and experience.

The professional and highly qualified staff are complemented by one of the most extensive test, analysis and experimental facilities in Europe.

Conference and Training Course Fees

The registration fee for the Conference is £695 + VAT. The registration fee covers delegate attendance, lunch, refreshments and conference documentation comprising a bound set of all papers presented.

The registration fee for the training course is £395 plus VAT which include attendance, lunch, refreshments and a set of course notes.

A combined package for both events is available at a cost of £980 plus VAT. A discount is available for NEL's Oil-in-Water Monitoring and Produced Water Club members.

A networking dinner will be held on Wednesday 30 June 2004 at the hotel at a cost of £35 plus VAT.

Accommodation is **not** included in the fee.

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Technical Programme

Day 1 - Wednesday 30 June 2004

08:30 – 09:00 Registration and Coffee

09:00 – 09:10 Chairman's Welcome and Introduction
Alex Hunt, Total

09:10 – 09:40 Overview of Production Separation Systems - Past, Present and Future
Øystein Holt and Erik Solheim, Statoil, Norway

09:40 – 10:10 Fundamentals of 2 and 3-Phase Separator Design for Moving and Fixed Platforms
Dave Stanbridge, CDS Engineering, The Netherlands and
Mike Oxley, BP, UK

10:10 – 10:40 Multiphase Separator Optimisation
Jon Berntsen, Mator AS, Norway

10:40 – 11:10 Coffee and Exhibition

11:10 – 11:40 Improving the Capability of the UK National Multiphase Flow Facility by Optimising its Three Phase Separator
Ming Yang, Neil Barton and Brian Millington, NEL, UK

11:40 – 12:10 Applied Methodologies (With Case Notes) For Upgrade of Multiphase Separators - From Review To Implementation
Brett Milligan and Nigel Weir, Opus, UK

12:10 – 12:30 Open Discussion Period

12:30 – 13:40 Lunch

13:40 – 14:10 Utilisation of Multiphase Pumping Technologies in Oil & Gas Production
Stuart Scott, Texas A&M University, USA

14:10 - 14:40 Characteristics of Twin-Screw Pumps in Multiphase Applications
Dietrich Müller-Link, Britta Schöneberg, Bornemann, Germany
Jonathan Calvert, J.P.S. (U.K.) Limited

14:40 - 15:10 Multiphase Pumps in Conjunction with Artificial Lift (Gas Lift, ESP)
Mike Cordner, Sulzer, UK
Jacques de Salis, Sulzer Pumps, France

15:10 - 15:40 Coffee and Exhibition

15:40 - 16:10 The Development, Application and Operating Experience of Subsea Multiphase Pumping Systems
Jon A. Sværen, Framo Engineering A.S, Norway

16:10 - 16:40 The Development of MultiBooster for Seabed Multiphase Pumping
Gunder Homstvedt and
Per E. Sorum, Kvaerner Oilfield Products AS, Norway

16:40 - 17:00 Open Discussion Period

17:00 Chairmans Closing Remarks



Technical Programme

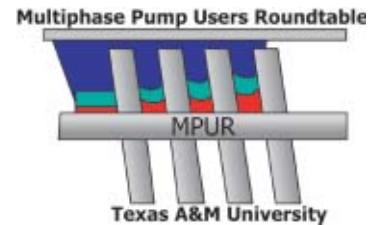
Day 2 - Thursday 1 July 2004

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| <p>08:50 – 09:00 Chairman's Welcome and Introduction
Douglas Dick, Primas, UK</p> <p>09:00 – 09:30 The Challenge of Designing Multiphase Gravity Separators
Per Eivind Gramme, Norsk Hydro, Norway</p> <p>09:30 – 10:00 Subsea Processing and Pumping in BP
Simon Dawson, BP, UK</p> <p>10:00 – 10:30 Compact Subsea Separation as a Field Development Building Block
Toine Hendriks, CDS Engineering, The Netherlands
Rune Fantoft, FMC Kongsberg, Norway</p> <p>10:30 – 11:00 Coffee and Exhibition</p> <p>11:00 – 11:30 Phase Profiling Technology for Offshore Production Separators
Raymond Lees, Tracerco, UK</p> <p>11:30 - 12:00 Measurements of Oil-Water Separation Dynamics in the Primary Separation Systems
Artur Jaworski, University of Manchester, UK and
Tom Dyakowski, UMIST, UK</p> <p>12:00– 12:30 Dynamic Separation Process Analyses (DSPA)
Bjorn Hope, Sensorteknikk AS, Norway</p> <p>12:30– 12:50 Open Discussion Period</p> | <p>12:50 – 14:00 Lunch</p> <p>14:00 – 14:30 Increasing Three Phase Separation Efficiency by Incorporating Electrostatic Coalescers into Separation Baffles
Hans Kristian Sundt, ABB Offshore Systems, Norway and
Henning Haugland, Norsk Hydro, Norway</p> <p>14:30 – 15:00 Increasing Production Capacity by Topside Process Optimisation and De-bottlenecking on FPSO's
Irina Pirie, Altra Energy, UK</p> <p>15:00 - 15:20 Coffee and Exhibition</p> <p>15:20 - 15:50 The Pipe Separator - Focus on the Advantages Compared to Conventional Gravity Separators and Subsea, Onshore and Topside Applications
Per Eivind Gramme and
Gunnar Hannibal Lie, Norsk Hydro, Norway</p> <p>15:50 - 16:20 Cost-effective De-bottlenecking of Separation Facilities by Use of Inline Technology
Trygve Håland, Statoil, Norway and
Rob Schook, CDS Engineering, The Netherlands</p> <p>16:20– 16:40 Open Discussion Period</p> <p>16:40 Chairmans Closing Remarks</p> |
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Multiphase Pump Training Course

29 June 2004

Airport Thistle Hotel
Aberdeen



Introduction

Multiphase pumping has evolved quickly in the past decade and has increasingly gained acceptance as "a best practice" in fields around the world. Operators are using multiphase pumps to reduce capital costs, as well as to improve production rates and to eliminate emissions.

This one-day short course is structured for the practicing facility, production or reservoir engineer. Engineering managers, project engineers, and equipment vendors will also benefit by learning how multiphase technology is being utilised by other companies and what applications show the most economic potential.

Some background knowledge in basic sciences and engineering sciences is required.

It will provide practical understanding of multiphase production systems, multiphase flow, multiphase pumping technologies and pumps available, also pump selection to installation and performance evaluation.

Objectives

The training course aims to help develop skills needed for the selection and specification of multiphase pumps.

The Course Presenter

Dr. Stuart L. Scott is an Associate Professor in the Harold Vance Department of Petroleum Engineering at Texas A&M University, USA. Dr. Scott holds a B.Sc (1982) degree in Petroleum Engineering, an M.Sc (1985) in Computer Science and a Ph.D (1987) degree in Petroleum Engineering all from the University of Tulsa. In 1992, Dr. Scott served as the overall Chair for the first SPE Forum on Multiphase Flow, Pumping and Separation Technology. Since 2001 he has chaired the Production Committee of the ASME Petroleum Division and in 2003 was awarded the ASME Henry R. Worthington Medal for his work in the area of multiphase pumping. Dr. Scott currently heads the Texas A&M's research efforts in the area of multiphase production systems, and chairs the annual Texas A&M Multiphase Pump User Roundtables (MPUR) and Multiphase Measurement Roundtable (MMR).

Training Course Fees

The registration fee for the Training Course is £395 + VAT. This amount covers the delegate fee, lunch, refreshments, and training course material. Accommodation is **not** included in the fee.

TECHNICAL PROGRAMME

08:30 **Registration, Tea & Coffee**

09:00 **The Modern Multiphase Production System**

- Conventional versus multiphase, example of field development strategies, game changing nature of multiphase production.

Multiphase Flow Fundamentals

- Oilfield fluids, water-cut, slip, liquid holdup, velocities, flow regimes, multiphase flow.

Overview of Multiphase Pumping Technologies

- Piston pumps, twin-screw, PCP, helicoaxial, comparison of operational envelopes, worldwide installation database.

10:50 **Coffee**

11:00 **Piston Pumps and Thermodynamic Considerations**

- Vertical hydraulic piston pumps, horizontal dual-acting piston pump, compression of a multiphase mixture.

Twin-Screw and PC Pumps

- Movement of fluids through pump re-circulation systems, slip and pressure profile within pump, methods to model behavior, operational envelope, seals and flush systems.

12:30 **Lunch**

13:30 **Twin-Screw and PC Pumps (continued)**

Helicoaxial and Other Rotodynamic Multiphase Pumps

- Movement of fluids within helicoaxial, ESP's and side-channel pumps, operational envelope, need for liquid storage.

Instrumentation and Speed Control

- Use of re-circulation, variable frequency drives and torque converters for speed control, control strategies, vibration, sand, P/T and multiphase metering.

15:20 **Coffee**

15:30 **Well Response to Multiphase Pumping**

- Single and multiphase rate equations, modelling tubing effects, modelling pump as component of production system, impact of backpressure on ultimate recovery, candidate selection.

Case Histories

- Significant multiphase pump applications will be detailed from around the world. Case histories presented at the Texas A&M Multiphase Pump User Roundtables (MPUR) over the past five years will be summarised. Available reliability data will be discussed as well as special issues such as sand, water cut and high temperatures.

High Interest and Current Research

- Recent technology survey results will be presented and emerging applications such as subsea, wet-gas and down hole will be discussed as well as Texas A&M current research efforts.

Q&A and Course Appraisals

17:30 **Course Close**

BOOKING FORM

Multiphase Pump Training Course

29 June

Advances in Multiphase Separation and Multiphase Pumping Technologies Conference

30 June - 1 July

Full name (inc. title) _____
Job title _____
Company _____
Address _____
Country _____ Postcode _____
Telephone _____ Fax _____
E-mail _____

We expect the event to be heavily subscribed. Places are strictly limited and are allocated on a first come, first served basis. Full payment must be received before the event date. Under UK excise regulations delegates from all countries are required to pay VAT at 17.5% on any conference/course taking place in the UK. Your place will be confirmed on receipt of a booking form. If you do not receive confirmation within 5 working days please contact NEL.

Method of Payment

Please tick relevant options:

- Conference: £695+VAT Training course: £395+VAT Combined package (Conference and Training course): £980+VAT
 Discount package (for members of NEL's Oil-in-Water Monitoring Club or Produced Water Club attending those events): £885+VAT
 Conference dinner 30 June: £35+VAT
 Invoice to company named above
 Cheque, made payable to TUV NEL Ltd, enclosed with this form

Bank transfer to National Westminster Bank Plc, East Solent, 176 London Road, Portsmouth, Hampshire PO2 9DR.

Account No. 11300175, Sort Code 52-41-32, Account name, "TUV NEL Limited", Swift Code NWBKGB2L.

Please advise your bank to include the event code COF158 and the delegate's surname in the transfer instructions.

Company VAT number (EC members states only). _____

Visa Mastercard Amex Diners Card Start Date _____ Expiry Date _____

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Card Holder's Name _____

Signature

Address (if different from above) _____

Where did you hear about this event?

Cancellation Policy

Any cancellations must be received in writing at least 14 days prior to the commencement of the event. A cancellation fee of £100.00 will be incurred. Once within this period the booking cannot be cancelled or any fees refunded, but a substitute delegate can be named at any time before the programme begins, provided that NEL are notified in advance. NEL reserves the right to cancel the event due to unforeseen circumstances. NEL is not liable for any expenses incurred by the delegate. This programme may be subject to change due to circumstances beyond the control of the organisers.

Venue and Accommodation

Airport Thistle Hotel, Aberdeen Airport, Argyll Road, Aberdeen, AB21 0AF

Tel: +44 0870 333 9149, Fax: +44 0870 333 924933

Hotel accommodation is not included in the registration fee.

Signed Date

Booking Form
Please complete and return to
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