



# THE NORTH SEA FLOW MEASUREMENT WORKSHOP

24th-27th October 2000

The Gleneagles Hotel, Perthshire, Scotland

Organised By:  
National Engineering Laboratory

Co-organised By:  
Norwegian Society of Chartered Engineers  
Norwegian Society for Oil & Gas Measurement

# Downhole Instrumentation Seminar

Monday 23 October 2000

National Engineering Laboratory, East Kilbride  
Glasgow, G75 0QU

### INTRODUCTION

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This seminar will serve as a useful precursor to the North Sea Flow Measurement Workshop.

The desire to reduce well costs and exploit mature and economically marginal fields has led to the implementation of sophisticated well configurations. Horizontal wells are now commonplace, High Pressure-High Temperature (HPHT) technology has been proven in the North Sea and multilateral and smart wells are being viewed as increasingly attractive options. In the longer term downhole separation and processing are likely to make a significant impact.

A comprehensive Technical Programme will be presented by leading representatives of operating companies, service companies and contract research organisations. The papers will cover operational experiences, new developments and future prospects in the fields of downhole measurement.

### TOPICS AND THEMES

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These will include:

- Smart wells and permanently installed sensors
- Logging and log interpretation
- Measurement while drilling, logging while drilling
- Drill stem testing
- Single and multiphase flow metering
- Water cut and gas hold-up sensors
- Pressure, temperature, density and noise measurement
- Measurement of corrosion, erosion and damage to the completion
- Data transmission
- Extracting the maximum information from existing measurements
- Where, when and what to measure?
- Future developments

Some of these themes will be developed further in a context of general flow metering in the oil industry at the North Sea Flow Measurement Workshop.

### BENEFITS OF ATTENDANCE

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The seminar will focus on downhole sensor technology, its effective application and realistic assessment of what can be achieved in the field. Delegates will gain an overview of the current situation and discuss the consequences of future developments. There will be opportunities for knowledge transfer between the fields of logging, completion systems and surface production control methods.

### WHO SHOULD ATTEND?

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The event is designed for those who are concerned with the design and operation of downhole production systems.

It is aimed at:

- Completion Engineers
- Reservoir Engineers
- Instrumentation Developers
- Technical Managers
- Researchers

from operating companies, logging companies, completion systems suppliers and instrumentation manufacturers in the oil and gas industry.

### CONTACT DETAILS

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If you require further details on this seminar when they become available, please complete the relevant part of the form at the back of this brochure.

Alternatively please contact Susan Tough at the address on back page.

# NORTH SEA FLOW MEASUREMENT WORKSHOP

## INTRODUCTION

The North Sea Flow Measurement Workshop is established as the premier world event where specialist engineers, involved with all aspects of oil and gas production, meet to review current flow measurement methods, techniques and advances. Building on the established reputation for quality, technical content and delegate participation, the Workshop will again be held in Scotland's prestigious Gleneagles Hotel.

## ABOUT THE WORKSHOP

Meeting alternately in Scotland and Norway, this annual event aims to bridge the gap between traditional academic flow measurement conferences and narrow scientific seminars. Technical presentations emphasise the practical advantages of current and future flow measurement technology and delegates are encouraged to share their experience with colleagues through participation in a wide range of active discussion groups. The technical programme covers up-to-date issues of concern to the North Sea Oil and Gas Industry, including session presentations from the major operators on subjects such as future metering requirements, multiphase metering field experience, fiscal metering, wet gas sampling and the rapid developments in ultrasonic flow meters.

The Workshop will be preceded by a One-day Downhole Instrumentation Seminar which will be held at NEL on Monday 23rd October. A separate calling notice and registration form will be issued for this event. Transport between venues will be provided for delegates attending both events.

## WORKSHOP FEE

To keep the focus on participation and 'real world' experience, the numbers for this years workshop will be restricted. Availability will be on a first-come first-served basis. As an added incentive to register early, those delegates who are obliged to pay the full registration rate will qualify for a reduction of £50 off their registration fee if they register and pay before 11 August 2000.

The full Workshop Fee is £1420. This includes lecture notes, cocktail reception, all meals, refreshments, banquet and accommodation. There is an early bird rate of £1370 for registrations and payment received before 11th August 2000. (Inclusive from 12.00 pm on 24th October to 10.00 am on Friday 27th October).

It is hoped that many delegates will use this opportunity to invite partners to share in the experience of staying in one of the worlds top hotels.

## TRANSPORT

Buses will be available to transport delegates and their partners from Glasgow and Aberdeen Airports to Gleneagles Hotel early on Tuesday 24th October 2000. Similar arrangements will be in place to return delegates and partners to Glasgow and Aberdeen Airports after close of Workshop on Friday 27th October. If you would prefer to take a taxi from Glasgow Airport to Gleneagles Hotel we would suggest you contact Croft Taxis on 0141 633 2222 and request the NEL special rate of £50.00. Please indicate on the Registration Form your arrival airport, flight number, arrival time and departure time.

## GENERAL

Scotland has many beautiful places of interest, which are well worth a visit. This year for the accompanying person, we have organised a 4 hour tour of Crieff, Perth and Scone Palace. This will include a visit to the Caithness Glass Factory near Perth and a tour of Scone Palace, for centuries the site of the coronation of the Kings of Scotland. There will also be a day trip to Edinburgh where you will be free to sight see and shop at your leisure.

## REGISTRATION, ENQUIRIES, ADMINISTRATION

Please complete the attached Registration Form and send it by post/fax to the address below. All enquiries, telephone bookings etc should be referred to the address below.

Susan Tough  
National Engineering Laboratory  
East Kilbride  
Glasgow  
G75 0U  
Tel: 01355 272974  
Fax: 01355 272626  
Email: nsfmw@nel.uk  
Online booking at [www.nel.uk](http://www.nel.uk)

## EXHIBITION OPPORTUNITY

There is still space available for your company to exhibit at this event. For further information please contact the above.

## ORGANISING COMMITTEE

Richard Paton, NEL  
Caroline Whitla, NEL  
Andy Jamieson, Shell UK Expro  
Bob Peters, McCrometer  
Lewis Philp  
Dennis Pinto, Caledonian Flow Systems  
Gordon Stobie, Phillips Petroleum Co Ltd  
Hugh Morel, D.N.O. Heather Ltd  
Oyvind Isaksen, Fluenta AS  
Jim Ryan, BP Chemicals Ltd.

## PROVISIONAL TECHNICAL PROGRAMME

### TUESDAY 24 OCTOBER 2000

- 12:30 Registration
- 12:30 - 14:00 Lunch
- 14:00 - 14:15 Welcome address.  
Dr F C Kinghorn, NEL
- SESSION 1** Chairman: R Paton
- 14:15 - 14:45 Determination of Gas Density at Operating Conditions.  
R Sakariassen, Statoil.
- 14:45 - 15:15 Advances in On-Line Gas Chromatography in the Natural Gas Industry.  
D J Pettigrew, Daniel Europe Ltd.
- 15:15 - 15:45 Use of Photoacoustic Measurement Technology to Measure Hydrocarbon Concentration Levels in Re-injection Lines.  
H MacKenzie, Heriot-Watt University.
- 15:45 - 16:15 Coffee
- SESSION 2** Chairman: D Pinto
- 16:15 - 16:45 Effortless Oil USM Fiscal Meter Operation: Krohne Altosonic-V: Master Meter Approach Recommendations, Based on: Vigdis/Snorre Crossover and the Snorre B Export Station FAT.  
M Dahlstrom, Norsk Hydro ASA.
- 16:45 - 17:15 Corrections of Readings From an Orifice Plate Installed in Reverse Orientation.  
G Brown, NEL.
- 18:00 - 19:00 Cocktail Reception
- 19:00 Dinner

### WEDNESDAY 25 OCTOBER

- SESSION 3** Chairman: R Peters
- 08:45 - 09:15 Challenges for Improved Accuracy and Traceability in Ultrasonic Fiscal Flow Metering.  
P Lunde, Christien Michelsen Research AS.
- 09:15 - 09:45 Whistling Flow Straighteners and their Influence on Ultrasonic Flow Meter Accuracy.  
H J Reizebos, Gasunie Research.
- 09:45 - 10:15 Progress in Ultrasonic Gas Flow Measurement in Noisy Environments.  
G de Boer, Instromet Ultrasonics BV.
- 10:15 - 10:45 Coffee
- SESSION 4** Chairman: L Philp
- 10:45 - 11:15 The Impact of Flow Pulsations on Multi-Path Ultrasonic Flow Meters.  
E van Bokhorst, TNO Institute of Applied Physics, The Netherlands.
- 11:15 - 11:45 Building Confidence with Multi-Path Ultrasonic Meters.  
A Niazi, B G Technology.
- 11:45 - 12:15 Smart Monitoring and Diagnostics for Ultrasonic Gas Meters.  
J Lansing, Daniel Industries Inc.
- 12:15 - 13:15 Lunch
- 13:15 - 16:30 Free Time
- 16:30 - 17:00 Coffee
- 17:00 - 19:00 Focus Discussion Groups
- 19:30 Dinner



## THURSDAY 26th OCTOBER

### SESSION 5 Chairman: A Jamieson

- 08:30 - 09:00 Wellhead Metering Using V-Cone Technology.  
**P Lawrence**, McCrometer.
- 09:00 - 09:30 The Discharge Coefficient and Through-Life Performance of Venturi Tubes.  
**M Reader-Harris**, NEL.
- 09:30 - 10:00 Long Term Comparison of an Ultrasonic Meter and a Turbine Meter with an Orifice Plate at the EMS Test Loop.  
**R Sakariassen**, Statoil.
- 10:00 - 10:30 Coffee

### SESSION 6 Chairman: G Stobie

- 10:30 - 11:00 Wet Gas Metering in the Upstream Area: Future Needs and Actual Applications.  
**J P Couput**, Elf Exploration & Production
- 11:00 - 11:30 The Performance of an Ultrasonic Meter in Wet Gas Service.  
**K Zanker**, Daniel Industries Inc.
- 11:30 - 12:00 A Venturi Based Wet Gas Meter with On-Line Gas Mass Fraction Estimation.  
**P Daniel**, ISA Controls Ltd.
- 12:00 - 13:30 Lunch

### SESSION 7 Chairman: H Morel

- 13:30 - 14:00 Traditional Uncertainty Analysis and IP Guideline.  
**R Paton**, NEL.
- 14:00 - 14:30 Application Rules for Vortex Shedding Flow Meters, Making a Selection Easy.  
**C H L Limpens**, TNO Institute of Applied Physics, The Netherlands.
- 14:30 - 15:00 Vocational Qualifications for Measurement Technicians and Engineers.  
**G Fish**, Metco.
- 15:00 - 15:30 Coffee

### SESSION 8 Chairman: O Isaksen

- 15:30 - 16:00 Operational Experience & Utilization of the Data from the Subsea Multiphase Flow Meter in the West Brae Field.  
**T A Larson**, Marathon Oil Company.
- 16:00 - 16:30 Multiphase Flow Rate Identification by Pattern Recognition at Shell Auk Alpha Platform.  
**H Toral**, Petroleum Software Ltd.
- 16:30 - 17:00 Subsea Multiphase Flow Metering in Offshore Brazil.  
**E Dykesteen**, Fluenta AS.
- 17:00 - 17:30 Final Paper
- 17:30 - 17:45 Closing Speech  
**Chairman**, Norwegian Organizing Committee.
- 19:30 Cocktails
- 20:00 Workshop Dinner

## FRIDAY 27th OCTOBER

- 08:30 Breakfast
- 10:00 Buses Leave for Airport

# **It is Anticipated That The Following Companies Will Exhibit:**

**T.N.O.**

**ISA Controls Ltd**

**Yokogawa**

**Stephen Gillespie Consultants**

**Flow Ltd**

**Omni Flow Computers**

**Multi-Fluid ASA**

**Proserv (NS) Ltd**

**Kelton Engineering**

**Rhomax**

**Daniel Europe Ltd**

**Instromet International**

**Kongsberg Offshore A.S.**

**Aquidata Excel J.V.**



**NATIONAL ENGINEERING  
LABORATORY**

National Engineering Laboratory, East Kilbride, Glasgow G75 0QU, UK

North Sea Flow Measurement Workshop  
24th-27th October 2000

Title ..... Full Name .....

Preferred name for badge .....

Job title .....

Company .....

Address .....

..... Post code .....

Telephone ..... Fax .....

E-mail .....

We expect the course to be heavily subscribed. Places are strictly limited and are allocated on a first-come first-served basis. Your place will be confirmed on receipt of a booking form.

Method of Payment

Payment must be included with your registration to guarantee your place and 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.

☐ Invoice to company named above

☐ Cheque, made payable to National Engineering Laboratory, enclosed with this form

☐ Bank transfer to National Westminster Bank, 14 Blythswood Square, Glasgow  
Account No: 14737825, Sort Code: 60-30-21, Account Name: TÜV Product Service Ltd -  
NEL Account, Reference: COF093

☐ Credit Card ☐ Visa ☐ Mastercard ☐ Amex Expiry Date.....  
Card No.     -     -     -

Card Holders Name.....Signature.....

Address (if different from above).....

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Remittance

Registration Fee\* ..... £1420

Early Bird Rate ..... £1370

Accompanying Person's Fee ..... £250

Total ..... £

Plus VAT (17.5%) ..... £

Total Remitted ..... £

\* Authors - please mark form as instructed.

# Booking Form Continued

## Accommodation Preference

Room Required:      Single Room ☐      Double Room ☐

Provisional Booking of Extra Nights at Gleneagles Hotel:      ☐ Nights Before      ☐ Nights After

Accompanying Person's Name .....

Arrival Date .....

Departure Date .....

**Note:** Accommodation and transport arrangements will be confirmed with joining instructions.  
Accommodation in Gleneagles Hotel will be allocated on a first-come first-served basis.

## Accompanying Person's Visit

Tuesday 24th October Visit to Edinburgh (subject to minimum number of 10 persons) ..... ☐

Wednesday 25th October (am) Visit to Crieff, Perth and Scone Palace ..... ☐

**Note:** This programme is subject to change.

## Transport

Please complete the following if you require transport:

### Arrivals

I wish transport from Glasgow Airport on 24th October 2000 am ..... ☐

I wish transport from Aberdeen Airport on 24th October 2000 am ..... ☐

I would like more information on the Downhole Seminar at NEL on 23rd October ..... ☐

I shall be attending the Downhole Seminar at NEL on 23rd October and require transport to Gleneagles on 24th October ..... ☐

Arrival Time ..... Flight No .....

### Departure

I wish transport to Glasgow Airport on 27th October 2000 from Gleneagles Hotel ..... ☐

I wish transport to Aberdeen Airport on 27th October 2000 from Gleneagles Hotel ..... ☐

Departure Time ..... Flight No .....

## Cancellation Policy

Substitution of delegates can be made at any time. If your cancellation is received before 1st September 2000 a charge of 25% will be made. A charge of 75% will be made after 1st September and before 1st October 2000. Any cancellations received after 1st October will not be refunded. NEL is not liable for any expenses incurred by the delegate.

Signed ..... Date .....

Please photocopy and return to:

Susan Tough, Flow Centre, National Engineering Laboratory, East Kilbride, Glasgow, G75 0QU, UK.  
Fax: +44 (0)1355 272626 or online booking: [www.nel.uk](http://www.nel.uk). To reach NEL no later than **19th September 2000**.