



The Michelsen Centre

for Industrial Measurement Science and Technology



Industry Training 2014-2015:

Let the Experts Teach You Industrial Flow Measurement and Uncertainty

Based on best practice and more than three decades of R&D within the oil and gas industry

Location: Christian Michelsen Research AS,
Fantoftvegen 38, Bergen (NORWAY)

www.michelsencentre.no/flowmeasurement

Lectures integrated with interactive exercises and demonstrations in our in-house flow loop.

The participants' own experiences and needs shape the course of our discussions.

Tailored Courses

Ask us if you have specific training needs! Examples: Fiscal Oil Metering, Non Fiscal Flow Measurement Technologies and Applications, Differential Pressure Elements, Ultrasound Flow Meter, Technology Reviews, Coriolis, Turbine, hands-on flow measurement training in our in-house flow loop, etc.

Our Instructors



Marie Bueie Holstad, PhD
Dept. Manager (CMR)



Kjetil Folgerø, PhD
Sr. Scientist (CMR)



Kjell-Eivind Frøysa, PhD
Dept. Manager (CMR)



Anders Hallanger,
MSc Sr. Scientist
(CMR)



Camilla Sætre, PhD
Scientist (CMR)

Introduction to Multiphase Flow Metering

Key words: Introduction to the basics of multiphase flow measurements incl. the presentation of three specific multiphase flow meters. Parts of the content are based upon the Norwegian Society for Oil and Gas Measurement's handbook in multiphase metering.

Learning goals: Basic knowledge and understanding of multiphase metering and selected multiphase metering technologies.

Target group: Instrumentation or measurement technicians, process engineers, technical staff, personnel in service- or supply companies, others who need intermediate-level understanding and insight in multiphase metering.

Main instructor: Department Manager Marie Bueie Holstad PhD (CMR)

Fee (exclusive VAT): NOK 21 400 (in 2014) / NOK XX (in 2015), lunch and refreshments included

Next courses:

- November 18-20, 2014
- March 10-12 2015
- November 10-12, 2015



Introduction to Uncertainty – ISO GUM

Key words: Practical introduction to the basics of measurement uncertainty, including the ISO Guide to the Expression of Uncertainty in Measurement (GUM).

Learning goals: Basic knowledge and understanding of the calculation and documentation of measurement uncertainty

Target group: HSE coordinators, instrumentation or measurement technicians, process engineers or others that need such knowledge in installation, modification, operation and maintenance

Prerequisites: General knowledge of measurement or process technology

Main instructor: Department Manager Kjell Eivind Frøysa PhD (CMR)

Fee (exclusive VAT): NOK 17 200 (in 2014) / NOK XX (in 2015), lunch and refreshments included

Next courses:

- November 11-13, 2014
- March 17-19, 2015
- November 17-19, 2015

Introduction to Fiscal Gas Flow Metering

Key words: Provides the technological understanding for regulations and best practice as described by the Norwegian Petroleum Directorate and NORSOK.

Learning goals: Overview of the most common metering concepts, metering stations, gas dynamics, flow calibration, fiscal calculations and uncertainty.

Target group: Instrumentation or measurement technicians, process engineers, or other technical staff, personnel in service- or supply companies, managers or others who need intermediate-level understanding of and insight in fiscal gas flow metering.

Prerequisites: Some general knowledge of industrial flow metering.

Main instructor: Department Manager Kjell-Eivind Frøysa PhD (CMR)

Fee (exclusive VAT): NOK 17 200 (in 2014) / NOK XX (in 2015), lunch and refreshments included

Next course:

- November 25-27, 2014
- March ,3-5 2015
- November 3-5 , 2015



Inquiries and Registration

- Email: training@cmr.no
- Web: www.michelsencentre.com/flowmeasurement
- Mail: The Michelsen Centre, P.O. Box 6031, NO-5892 Bergen, NORWAY

Cancellation policy

- A minimum of ten participants is required per course. You may withdraw from a course up to the cancellation date without cost. Substitutions are accepted when notification is given in advance.
- A fee of 25% of the course fee will be charged per cancellation received after the cancellation deadline. The courses may be modified or cancelled due to circumstances beyond the organisers' control.

The Michelsen Centre

The Michelsen Centre for Measurement Science and Technology (MIMT) www.michelsencentre.no was granted status as a Centre of Research-Based Innovation by the Research Council of Norway in 2006 and is hosted by Christian Michelsen Research AS (CMR) in Bergen (NORWAY).

MIMT has currently 3 research partners (CMR, University of Bergen, and Bergen University College) and 8 industry partners (Aanderaa, Archer, Seabed Geosolutions, FMC Metering, Havyard Tendos, Proanalysis, Roxar Emerson, Statoil)

Christian Michelsen Research AS (Norway)

Christian Michelsen Research AS (CMR) www.cmr.no represents more than three decades of continuous R&D work on advanced measurement solutions for liquid and gas measurements within the oil and gas industry. The research and development of advanced measurement technologies has enabled significant industrial product development, and the establishment of new business ventures within the oil and gas industry.

The Norwegian Society for Oil and Gas Measurement

The Norwegian Society for Oil and Gas Measurement www.nfogm.no is an independent society for personnel engaged in measurement of oil and gas in the Norwegian oil and gas business. NFOGM has developed several handbooks within flow metering that provide guidance and recommendations to the industry. This includes the handbook that is part of the background for the course 'Introduction to Multiphase Flow Metering'.