Program Overview
October 2011
METCO REF: Course 5

Oil and Gas Metering

Background

The METCO fiscal metering course is based on a series of standard curriculum that are referred to as generic courses. The generic courses are based upon a modular format.

The structure of the course modules are summarized on page 3 of this document.

Material for this oil and gas flow measurement course has been accumulated over more than 30 years. The course material is continuously being upgraded and expanded to incorporate new and revised methods, techniques or equipment. The generic course assumes that some delegates may require explanations of basic principles so basic first principles are covered. The course also delves into the more complex aspects of fiscal metering. Emphasis between the 'basic' or the 'complex' aspects can be varied to suit the experience of the delegates attending.

It should be emphasized that this training course already incorporates most aspects of fiscal / custody transfer metering and can accommodate most custody transfer metering station configurations. The course presentation material is provided in a PDF format on a course training disk. Selected files may be preAviewed by the client on any PC.

Where can i take the course?

Training courses can be taken at out Aberdeen headquarters in Scotland or at your preferred global facility.

METCO can assist you with finding local accommodation and transportation for any out-of-town candidates who are put forward. Our facility is located within 3km from the Aberdeen Airport terminal.

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Who should attend?

The course is focused towards the following personnel:

- Maintenance technicians
- Supervisors
- Engineers

A basic knowledge of metering operations or maintenance is necessary for attendance on this course.

Oil and gas flow measurement: What will I learn?

The course addresses the concepts of custody transfer metering, principle of allocation in shared facilities, and the general operating principles of custody transfer instruments:

- Flow meters (orifice, turbine, ultrasonic, venture, corilis)
- Densitometers
- Pressure / temperature / differential transmitters
- Automatic samplers
- BS & W measurements
- Chromatography
- Physics of natural gas mixtures
- Calculation routines and verification of flow computers
- Implementation of international standards
- Generic operating and reporting procedures
- The function of the pipeline and regulatory auditors
- Review of typical fault conditions

We are happy to set up a course to suit your needs and can even customize the modules and training to your exact requirements. Please ask us about our customized client training courses and we will be happy to provide details.

How long will it take to complete?

The generic course is run over three to three and a half days (subject to how many modules covered), scheduled from 0900 to 1700 hours.

Any customized client courses may require alternative timescales to complete.

How much will it cost?

To join one of the pre-arranged courses based at Emerson House, the cost per candidate would be £1,450.

The course fee includes lunch and a copy of the training manual on CD in PDF format.

If you have more than three candidates for one of our pre-organized open courses, we would be happy to offer a discount.

Whom can I contact for more details?

We would be happy to discuss any aspects of your measurement training requirements, be it for one of our generic open training courses, to assessing your metering technicians in the Scottish Vocational Qualification (SVQ) in flow measurement “Measurement Processes (Maintenance) Level 3”.

You can contact the METCO Sales Team through email: METCOsales@Emerson.com

How do i book it?

Booking your training course is very easy. Please contact one of our sales team, who will provide you with full joining instructions and payment options.*

How to pay?

Payment for training can be made in advance by:

- Pro-forma invoice
- Pre-approved Nett 30 day credit account
- Credit card

What are the topics covered during the course?

The trainer will work with the list of modules overleaf and adapt the course to class experience and requirements.

*Subject to Terms and Conditions.

Course Modules

Activity	Session	Module	Topic	Content
General	1	Tyro 010	Introduction	Greetings and introduction
	2	Tyro 020	Why meter?	Focus on monetary implications of hydrocarbon measurements, overview of methods, and definition of terms
	3	Tyro 650	Traceability	Definition of SI units and principles of traceability of measurement / instrument calibration
	4	Tyro 910	Uncertainty	Relevance and general principles of meter station uncertainty budgets
	5	Tyro 600	Allocation	Overview of principles and implications of shared pipeline hydrocarbon allocation, based on North Sea practices
	6 *Optional*	Tyro 800	Choice of Meter	Overview description of available meter types with pros and cons
Flow Computers	7	Tyro 500	Flow computer overview	Overview on common features of dedicated flow computers
	8	Tyro 520	Turbine meter flow computers	Function and calculation sequence of turbine meter flow computers
	9	Tyro 525	Testing turbine meter flow computers	Principles of verification of turbine meter flow computers
	10	Tyro 530	Meter prover computers	Function and calculation sequence of prover flow computers
	11	Tyro 540	Differential pressure gas flow computers	Function and calculation sequence of orifice plate flow computers
	12	Tyro 545	Testing DP gas flow computers	Principles of verification of orifice plate flow computers
		Tyro 580		
Liquid Metering	13	Tyro 300	Turbine meters	Principles and practice of operating crude oil turbine meters
	14 *Optional*	Tyro 310	Positive displacement meters	Principles and practice of operating crude oil PD meters
	15 *Optional*	Tyro 850	The coriolis meter	Principles and practice of operating coriolis meters
	16	Tyro 400	Meter proving	Proving background, volumetric tanks, pipe provers methods, and handling
	17	Tyro 450	Meter control charts	Principles of meter K-factor control
	18	Tyro 330	Liquid densitometers	Focus on Mobrey Solartron 7830 series densitometers
	19	Tyro 350	Automatic samplers	Representative sampling, operation of automatic samplers, and sample handling
	20	Tyro 380	BS & W	Liquid mixture equations, principles of BS&W probes
	21 *Optional*	Tyro 700	Storage Tanks	Introduction to storage tank measurements

Course Modules

Activity	Session	Module	Topic	Content
Gas Metering	22	Tyro 105	Gas Metering Overview	Introduction to gas flow meters
	23 *Optional*	Tyro 810	The multi-path ultrasonic meter	Principles and practice of operating gas and liquid MPUSMs
	24	Tyro 100	The orifice plate meter	Principles and practice of operating orifice plate meters, reference plane of measurement, and flow equations
	25 *Optional*	Tyro 110	The differential pressure flow equation	Derivation of mass flow equations
	26 *Optional*	Tyro 180	Orifice carriers	Overview of principles and implications of shared pipeline hydrocarbon allocation, based on North Sea practices
	27	Tyro 115	Metering instruments	General principles, pressure and temperature transmitters
	28	Tyro 160	The gas densitometer	Mobrey Solartron gas densitometers and RD analyzers
	29	Tyro 150	Gas chromatograph	Principles of gas chromatography based on Danalyzers
	30 *Optional*	Tyro 270	Dewpoint Instruments	Principles of some instruments (e.g., Ametek)
	31	Tyro 210	Gas characteristics	Gas physics, handling, and deriving properties of gas mixtures
	32 *Optional*	Tyro 590	Wet gas metering	Principles of wet gas venturi meters – Murdock, Chisholm, and De Leeuw
Procedures	33	Tyro 660	Reporting procedures	Generalized overview of reporting hydrocarbon meter station data
	34	Tyro 665	The audit trail	The role of meter station auditors
	35	Tyro 670	Operating procedures	Generalized overview of operating a hydrocarbon meter station
	36	Tyro 680	Fault conditions	Guidance on predictable fualt conditions and mismeasurement methods

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