एफ.सी.आर.आई

FCRI

Course on:

Liquid Hydrocarbon Flow Measurement and Custody Transfer

3 days, 22-24 April 2020

199th in Series

Organised by:

FLUID CONTROL RESEARCH INSTITUTE

ISO 9 ,

(ISO 9001: 2008 CERTIFIED, NABL ACCREDITED ORGANISATION)

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(MINISTRY OF HEAVY INDUSTRIES & PUBLIC ENTERPRISES, GOVT. OF INDIA)

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KANJIKODE WEST, PALAKKAD – 678 623, KERALA.

TEL: +91-491-2566120, 2566206, 2566119, 2569010, FAX: +91-491-2566326

About the Programme

How important is the accurate bulk liquid measurement for companies? Petroleum products bought and sold on the world wide market may be transported over thousands of miles and change ownership many times from the well head to the end user. Each time the product changes ownership, a "custody transfer" is completed and both buyer and seller expect their asset share to be accurately measured. More often than not, companies find measurement do not match up and this may result in serious losses to the companies, litigations and arbitrations at national / international courts or both. After the beginning of the dismantling of Administrative pricing mechanism in India the competition among Petroleum companies is all the more tougher.

Process measurement occurs within refineries and other process plants as part of the refining and manufacturing process. There are many occasions within a refinery or process plant when liquids need to be measured so that the right quantity of products will be produced. These applications can be grouped under the title of process measurement and are very critical in many applications.

A clear understanding of the intricacies of fluid measurement will solve problems associated with flow measurements. But it is easier said than done. For everyone involved in hydrocarbon flow measurement it is important to share the knowledge to maximize the benefits that accurate flow measurements can accrue. A common question invariably at flow measurement courses and workshops is "What type of meter is best for my application"? The answer obviously depend on many factors, but shall first be preceded by ignored considerations of assorted influences of flow, fluid and measurement.

This course has been designed to cover the interests of petroleum production and process industries, power sector, flow meter manufacturers, dispenser manufacturers and users, aviation industry, pipeline transporters (petroleum product), research organizations and academic institutions.

*10% Discounts for nominating 5 or more participants.

The Fees includes registration fee, course materials, participation certificate, group photo, and lunch & refreshments, local transportation during the course days). FCRI is exempted from payment of income tax. This course is purely Non-Residential. Assistance can be provided for booking accommodation in hotels in and around Palakkad, Kerala.

Topics Covered

- **Fundamentals of Flow Measurement**
- **Principles and Operation of Flow Meters - An Overview**
- **Coriolis Mass Flow Meters for Custody Transfer – Theory and Practice**
- **Ultrasonic Flow Meters**
- **Model Approval of Flow Meters, Petroleum Dispensers and LPG Dispensers as per OIML R 117**
- **Uncertainty Estimation in Flow Measurement as per ISO/ NABL Guidelines**
- **Selection of Flow Meters**
- **Installation Effects on Flow Meters**
- **Calibration of CNG Dispensers - Field Experience**
- **Multiphase Flow Metering**
- **Pipe Provers**
- **Calibration of Flow Meters - Gravimetric, Volumetric and Master Meter Methods**
- **Importance and Measurement of Temperature, Pressure and Density**
- **Auditing of Gas Flow Metering Installations**

Lab Experiments /Demonstrations

Calibration of Flow Meters in
1) Water Flow Laboratory
2) Oil Flow Laboratory

General Information:

Venue : FCRI, Kanjikode West, Palakkad
Time : 9.30 AM to 5.30 PM

Target Group

Metering and Instrumentation Engineers, Production and Reservoir Engineers, Hydrocarbon Accountants, Product Suppliers, Metering System Vendors, Government Agencies, Researchers.

Registration fees :

Fees (Non Residential)

For Participants working in India :
Rs. 15,435/- + 18% GST x Rs.2,778/- Total Rs. 18,213/- per participant +1% KFC Rs.154/- (as applicable)

For Participants from abroad: US $ 908 + G.S.T. 18 % US $163 + Charge US $ 20 = Total US $ 1,091/- per foreign participant +1% KFC US$ 9/-

We accept e-payment only

Bank Details : State Bank of India(SME Branch)
Kanjikode west, Palakkad - 678 623
Account Name : Fluid Control Research Institute
Account No. : 10258760349 & IFSC Code : SBIN0006640

Please email GST identification number, invoice address and e-payment details to training@fcriindia.com

About FCRI

FCRI, A state of the art Flow and Fluid engineering facility, first of its kind in South East Asia is dedicated to Research & Development in Fluid Flow Measurement & Control Techniques. About 100 sponsored projects for various reputed organisations have been successfully completed by the Institute. The institute provides facilities towards technological developments to the flow product industries and serves as a National Certifying Authority and Quality / Reliability evaluation facility. The Institute also provides facility for calibration of metrological, pressure, temperature, electrical parameters, noise, vibration etc. for ISO certification. Apart from testing and calibration, the Institute conducts National and International training programmes in the field of flow control, Measurement & Instrumentation, Metrology, Pressure and temperature measurement / Calibration and related areas.

Major Calibration & Test Facilities at FCRI

Laboratory Fluid flow NABL C026/T027		Maximum Flow Rate (m^3/h)	Maximum Line Size	Uncertainty in Flow Rate (% reading)	Uncertainty in Volume (% reading)	
Water Flow		4500 15000	900mm 2000mm	Upto 200m^3/h : ±0.05% 200 to 2500m^3/h : ±0.10% 2500 to 4500 m^3/h : ±0.15% 5000-15000m^3/h : ±0.5%	2m^3 - 20m^3 : ± 0.05%	
Air Flow At Ambient conditions		10000	400mm	0.016 m^3/h to 0.25m^3/h : ±0.3% 0.25 m^3/h to 40m^3/h : ±0.1% 0.7 m^3/h to 400m^3/h : ±0.15% > 400m^3/h 10000m^3h : ±0.25%	0-0.5 m^3 : ±0.1% 2 m^3 : ±0.1%	
Closed loop Air Test Facility (20 Bar) *Calibration Loop *Gravimetric Loop Velocity		10- 400m^3/h 4-1000kg/h	150mm 50mm	± 0.3% ± 0.1%		
Oil Flow		650	250mm	0-100m^3/hr : ± 0.05% 100-600m^3/hr : ± 0.075%	Upto 1.8m^3 : ± 0.03% 1.8m^3 to 9 m^3 : ± 0.04%	
Compressed Natural Gas		4500 Kg/hr	1.5"	± 0.1%*	*under-Accreditation	

Mechanical Calibration Metrological, Pressure, Noise, Vibration etc. NABL C 056						
Parameters		Range	Calibration & Measurement Capability	Parameters	Range	Calibration & Measurement Capability
MASS-Standards Weights		1mg and upto 500kg	0.0048 mg to 1.2g	PRESSURE pressure transducers	1 to 60bar 60 – 1200bar	0.04% of rdg 0.026% of rdg
MASS-Weighing Balance & Mass Comparator		Various ranges from 0-2 g to 600 Kg	0.005mg to 0.05 Kg	Pressure-gauge pressure transducers (pneumatic)	30mbr to 2000 mbar abs	0.02% of rdg
		600 Kg to 2000 Kg	0.1 Kg		0.25 bar to 20 bar abs	0.038% of rdg
		2000 Kg to 20000Kg	3.53 Kg			
VOLUME -Specific Gravity bottle, Pipettes, Burettes Measuring Flasks		1 ml – 5000 ml	0.05ml to 0.7ml	Pressure-Low pressure gauge & differential	0.2 mbar to 10 mbar	0.88% rdg
					10mbar to 160mbar	± 0.077%of rdg
DENSITY - Hydrometers		0.64 g/cc – 1.98 g/cc	±0.0005 g/ml	Pressure-gauge pressure transducer (pneumatic)	30 mbar to 2000 mbar	± 0.02% of rdg
VISCOSITY	Dynamic	1to 60000 mPas/cSt	± - 1.0% rdg	Pressure-vacuum (gauge)	-100 to 980mbar g	± 0.06 of rdg
	Kinematic	1to 60000 cSt	± - 1.0% rdg	LENGTH- slip Gauges (steel)	0.5 – 100 mm	0.05 µm to 0.16µm
Acoustic Pressure – Free Field		125 Hz to 20 Hz	≤0.5 dB	Vibration Test Facility	6000 Kgf / 2000Kgf shaker 5 Hz to 2000 Hz	
Acoustic Pressure – Pressure Field		94 & 114 dB @ 1 kHz 124 dB @ 250 Hz	0.5dB	Acoustic Test Facility	Hemi Anechoic Chamber ISO3745	
Acoustic Power		125Hz to 16 kHz	2.0dB	Temperature & RH Test Facility	-70 to 180 deg C 10 to 98 % RH	
Vibration Amplitude - Analyzer		0.1 to 15g (acceleration) 1 to 240mm/s(velocity) 0.01 to 10mm(displacement)	2.4 %			
Vibration Amplitude –Sensor Linearity		2Hz to 15 kHz Upto 30g pk	≤2.5 % 1.25%		Dust – IP 5X, 6X	
Speed (Contact)		100 to 10000 rpm	1.6 rpm	* IP Tests		
Speed (Non-contact)		60 to 100000 rpm	≤2.4 rpm		Water – IP X3 to X8	

Electro Technical Calibration Electro Technical Calibration NABL C 0254						
		±100µV to ±1000 V ±0.1mV to ±1000V 1mV to 1000V 100mV to 1000V	0.60% to 0.001% 0.12% to 0.012% 0.4% to 0.014% 0.04% to 0.03%	DC Current Source Measure AC Current Source Measure	±100µA to ±1000A ±100µA to ±20A 100µA to 700A 100µA to 10A	0.014% to 2.0% 0.013% to 0.05% 0.04% to 1% 0.06% to 0.035%
Resistance Source Measure		10µΩ 10G Ω 100µΩ 1G Ω	0.6% to 0.02% 0.42% to 0.5%			
Time		1 Sec – 5400 sec	1.53 µSec to 5.4mSec	Frequency	1 Hz to 1 GHz	10mµHz to 1.2 Hz
Thermal Calibration NABL C 0255						
Temperature		-70 ºC to +1200 ºC	±0.07ºC to 1.3ºC	Fixed Point Cells	-38.8344ºC to 961.78ºC	2.9mºC to 19.7mºC
*Temperature & Humidity Chamber		- 70ºC to 180ºC 10% to 95% RH				

NABL Approved Test Facilities

Control Valves/Actuators	Cv, FL, Seat leakage test, Fugitive emission, cryogenic testing, torque
Water Meters	All test as per IS 6784, IS 779,IS 2373, IS0 4064
Butterfly Valves & Actuators	POD tests as per AWWA C504 & C540
Venting devices/air valves	API 2000
Safety Relief Valves	ASME PTC 25
Gas Turbine Meters	OIMLR137-1 Model Approval
Gas Regulators	BS EN 334
Diaphragm Gas meters	BS EN 1359 Model Approval
Liquid Flow Meters	As per relevant standards

Other Tests

Life Cycle Tests & Cavitation Tests for valves

RECOGNITION OF FCRI

Agency	Category
National Accreditation Board for Testing and Calibration Laboratories (NABL)	Calibration/Testing of Flow Products, Mechanical Measurements Thermal Calibration, Electro Technical Calibration
Netherlands Measurement Institute (NMI)	CLATF (20 Bar, 400 m^3/h) of FCRI complies with the criteria for Calibration Laboratories as per ISO/IEC 17025
Department of Science & Technology	Recognized R&D Institute
Department of Weights & Measures (Ministry of Civil Supplies)	Model Approval tests on flowmeter for custody transfer of oil/gas as per OIML Standard
Chief Controller of Explosives, Nagpur	Testing of Safety Relief Valves
Bureau of Indian Standards	Testing of Water Meters, Anemometers etc.
Institution of Fire Engineers, New Delhi	Hydraulic Qualification tests on fire fighting equipments
Central Pollution Control Board	Certification of Petrol, Kerosene & Diesel Generators for type approval
Nuclear Power Corporation	Seismic Studies for Power plant Equipments
Ministry of External Affairs (ITEC) & Ministry of Finance, Dept. of Economic Affairs (Colombo Plan)	Training programmes for Foreign Nationals on Flow Measurement and Instrumentation for Oil Gas & Water utilities/industries
GCAS Quality Certification Pvt. Ltd.,	ISO 9001:2008 Certification in Calibration & testing of fluid flow component, calibration of mechanical, electro technical, thermal instruments, flow calibration & measurements at site, project consultancy & implementation, professional training.

Registration

Registration for the training program can be confirmed by sending the details: Name, Designation, Organisation, Postal Address Email/Phone/Fax/Post to the address given below. The course fee is to be remitted in advance through E – Payment only. The registration must be completed on or before 6th April 2020.

For further information & Registration, please contact:

The Head Training
Fluid Control Research Institute
Kanjikode West, Palakkad-678623,
Kerala, India
Telephone: 0491-2566206, 2566120,
Fax: 0491-2566326
Email: training@fcriindia.com
Website: www.fcriindia.com