

Corpus Christi Area Measurement Society

**Measurement School
February 16-17, 2016**



**Omni Bayfront Hotel
Corpus Christi, TX**

Welcome Everyone to the CCAMS 2016 Measurement School

Welcome to the **2016 Corpus Christi Area Measurement Society School**. The board members of the CCAMS, along with all of the instructors and exhibitors, hope that you will get some useful information out this year's school. We also hope you make some contacts with other people in the field of hydrocarbon measurement that will be helpful to you in the future. Below is a list of some of the things going on at the school. We hope you enjoy the classes and learn something you didn't know.

Lecture Classes

There will be many lecture classes available that should provide you with a basic understanding of the subject. It is difficult to cover some of these topics thoroughly in such a short time-period. Each instructor is an expert in his or her field, and should be capable of answering most of your questions. So please ask questions, as you may not be the only one interested in the answer. Lecture classes are not intended to be a sales pitch for a company or product. Please let us know if you feel as though it was.

Hands-On/Demonstration Classes

There are a number of hands-on and demonstration classes which highlight a specific piece of equipment, technique, or software package that is being used by some of our students. These classes are not designed to be sales pitches, but are supposed to provide students with some hands-on experience, or at least demonstrations of the equipment. We hope that those of you who own some of this equipment will have an opportunity to get some additional training from the instructor in this setting. It also provides students who do not currently use the equipment a chance to see it in operation. **Space is limited for these classes to between 10 and 20 students on a first-come first-served basis.**

Exhibits

Along with the large number of classes available, there is an exhibit area where the latest technology in oil and gas measurement is available to be viewed. There are over 70 exhibitors who are more than willing to show you their products and may lead you to a discovery on how to perform your measurement more accurately, and with less effort than you are currently doing. The Eagle Ford oil field has many challenges which are different than other areas. These exhibitors may have the answer you've been looking for. The exhibits are for educational purposes and is not a trade show for sales from the vendors.

Lunch

Lunch will be available to those who purchased it when they registered for the school. You must have a ticket to attend the luncheon. Lunch will be in the **Bayview** room on the first floor of the hotel. We will be serving chicken-fried steak Tuesday and meatloaf on Wednesday. We wish we could accommodate everyone, but there is a limit to how many seats are available. There is a restaurant in the hotel and there are several other restaurants within a few blocks of the hotel.

Door Prizes

During the school there will be plenty of break time available for students to visit the exhibit area and visit with other students at the school. There will door prizes drawn during each of the breaks at various locations in the exhibit area. The door prizes are donated by the exhibitors and the CCAMS board to add a little excitement to the breaks. I hope you are one of the lucky ones to get something.

GoPro Camera and Yeti Cooler Giveaway

After the final class on Wednesday there will be a drawing for a GoPro camera and a soft-sided Yeti cooler. The students who are committed enough to stay through the last class of the school will get a chance at one of these prizes as well as a \$50 gift card in each classroom. We understand everyone's need to go back to work, but this school is a rare opportunity to learn hydrocarbon measurement from some very knowledgeable instructors. So as an encouragement to keep everyone around until the very end we will give these prizes to some lucky folks. We hope you win.

Special Thank You

I would like to thank the following people who dedicated quite a bit of their time to make this school possible. Without them, none of this would have happened.

Troy Dodson-President
Joyce Boyce-Registration
Diana Cantu-Treasurer
Warren Lang-Audio Visual/Gopher
Chris French/Matt Downs-Facilities
Lisa James-Class Schedule
Bill Stahl -Exhibits
Steve Whitman/John Anerousis -Website
Jim Lee-Special Advisor-Documents

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Class Descriptions

Advancements in Clamp-on Ultrasonic Flow Meters: This class will discuss the use and advancements in clamp-on or non-intrusive ultrasonic metering.

Automatic Liquid Sampling Per API Chapter 8.2: The class will look at components, considerations, and design requirements for building automatic liquid sampling systems that comply with API MPMS Chapter 8.2.

Basic Operations and Maintenance of EFMs: This class will focus on the fundamental use of flow computers in natural gas.

Best Practices of Natural Gas Manifolds: The best practices around natural gas manifolds, an important part of orifice measurement.

Better Results with Sampling and Shrinkages: Understanding light hydrocarbon shrinkage in relation to volatile crude oil.

Calculations of Liquid Petroleum Quantities: Calculation of liquid hydrocarbons using static and dynamic measurement methods.

Challenges of Metering Eagle Ford Gases and Liquids: This class will cover the multitude of problems associated with trying to measure natural gas with entrained liquids and liquid measurement with excessive entrained gases. Both are undesirable.

Chromatograph Maintenance and Troubleshooting: This class will offer a high level look at routine maintenance and diagnostics for gas chromatographs and their sampling systems.

Common Mistakes in Liquid Measurement: Common mistakes made in liquid measurement causing small and significant errors.

Coriolis Meters for Liquid Hydrocarbon Measurement: The design and theory of Coriolis meters used in liquid hydrocarbon measurement.

Coriolis Meters: What Makes Them Tick and What Makes Them Sick: An overview of Coriolis meter technology and how to diagnose possible errors and failures with the diagnostics available in the meters.

Custody Transfer Liquid Ultrasonic Meters for Liquid Measurement: Understanding liquid ultrasonic meters and their requirement to ensure accurate measurement.

Design and Operation of Continuous Sampling Systems: The Proper design and operation of online sampling systems.

Determining BS&W Content by Centrifuge and Karl Fischer Methods: Explanation and comparison of the two most common methods of determining water content in crude oil.

Driving Down Costs with Wireless Automation: The advantages of using wireless technology to eliminate the cost of wiring and conduit in the oil field.

Electronic Ticketing for Crude Oil: A review of the latest advances in electronic ticketing for the transfer of crude oil and other hydrocarbon liquids, with a focus on the accuracy and timeliness of ticket creation, distribution, and reporting.

Everything You Ever Wanted to Know About H2S Measurement: Methods to detect H2S in gas and liquid applications.

Field Experience with Coriolis Meters: This will be a panel discussion on real-life experiences with Coriolis metering from 3 industry experts. Jim Lee-Koch Pipeline, Steve Whitman-Coastal Flow, Marsha Yon-Micro Motion (retired)

Flare Measurement Practices: Methods available to measure flare gas for compliance with EPA regulations.

Flow Computers for Liquid Measurement: This class will discuss liquid flow computers and how they are used in various measurement situations.

Flow Management Devices Small Volume Prover: This is a demonstration class on FMD's small volume provers mechanical and electronic systems.

Fundamentals of Liquid Measurement: This class will cover many aspects of liquid measurement by metering. It will cover the basic equations for dynamic measurement, quantity and quality, meter types, their selection and proving conditions for accurate measurement.

Fundamental Well-Site Automation: This class will describe the range of possibilities that exist with automating well sites with modern technology.

Guided Wave Radar Tank Gauges: This class will discuss the technology of guided wave radar tank measurement.

Hand-working Crude Oil Lease Tanks: The proper method of working a typical lease tank for custody transfer.

Hydrocarbon Spectroscopic Analysis: Analyzing various quality parameters with real-time infrared and near infrared spectroscopy

Importance of Measurement Accuracy When Addressing "Lost & Unaccounted" Gas:

Installation and Operation of Densitometers: This class will focus on the proper way to install and operate densitometers used in mass measurement.

Installation and Operational Errors in Gas Measurement: This paper reviews some types of installation and operation errors found for orifice, ultrasonic, and turbine flow meters used in natural gas applications.

Level Controls and Valves and Their Effect on Measurement: This class will cover the effects that control valves and level controllers have at the lease site on liquid and gas measurement.

Liquid Meter Proving Systems and Techniques: This class will discuss the various kinds of meter provers used for liquid service.

Liquid Meter Skid Electrical Component Demo: This class will have a test stand which shows how the electrical components are wired and integrated on a liquid meter skid.

Liquid Metering Station Design: The class is an overview of the process involved in the design of a custody transfer metering station including meter selection and environmental and physical constraints of the station.

Liquid Turbine Meter Fundamentals: This lecture class will discuss the proper use and design of turbine meters for liquid measurement.

Meter Proving– The Role of the Witness: Witnessing meter provings means more than just signing the paperwork. This class discusses what a person needs to understand what’s going on, and what to look for when witnessing a meter proving.

MicroMotion Coriolis Meters: This class will be a demonstration class on the new 5700 Coriolis meter transmitter in Prolink 3.

Modbus for Dummies: A fundamental class which will discuss Modbus communication and its use in the oilfield.

Mythbusters: Why Orifice Measurements Are Better Than You Think: Overview of the history and theory of orifice measurement along with a maintenance and applications of use.

Natural Gas Flow Meters, Why Calibrate?: This class will provide insight as to why it is important to calibrate gas flow meters and tips on working effectively with flow calibration labs.

Natural Gas Sampling Challenges in Eagle Ford: This class will cover how to properly sample natural gas under the challenging conditions found in the Eagle Ford.

NGL Measurement –Direct and Inferred Mass: This will be an overview of API Chapter 14 section 7 mass measurement of Natural Gas Liquids by both direct and inferred mass methods.

Omni Flow Computers: This is a hands-on class showing how to configure and use an Omni flow computer.

Operation & Maintenance of Daniel Senior Fitting: Best practices for operation and Maintenance of the Daniel Senior Fitting.

Orifice Meter Field Testing and Calibration: This class will discuss the proper methods of testing natural gas orifice meters in the field.

Production Application Measurement: This class will discuss the difficulties around measuring liquids in a production setting.

Programming/Troubleshooting Guided Wave Radar in Oilfield Storage Tanks: This is a demonstration class for guided wave radar tank gauges.

Proper Design of Crude Oil LACT Units: This class will describe the proper design and equipment requirements needed for a LACT unit at a lease or production site for liquid measurement.

Proving Liquid Coriolis Meters in Crude Service: This class will describe the correct method for proving liquid Coriolis meters in both volume and mass.

Reducing Uncertainty in NGL and Natural Gas Sampling: How to reduce errors and uncertainty with NGL and Natural Gas sampling.

Repairing (PD) Positive Displacement Meters: This hands-on/demonstration class will show how to properly repair PD meters.

ROCLink for FloBoss and ROC Flow Computers: Basic navigation of Emerson ROCLink for programming ROC800/Floboss107

Rosemount Analytical Chromatographs: This will be a demonstration class on the Rosemount 370XA natural gas chromatograph including the new features available.

SCADAPack Oil and Gas Flow Computers: Hands-on class showing the use of Schneider Electric's SCADAPack RTU for oil and gas measurement.

Scanner Flow Computers: This hands-on class will cover configuration and troubleshooting Scanner Flow Computers

Siemens Clamp-On Ultrasonic Flow Meter: A demonstration /hands-on class of installation and use of Siemens clamp-on ultrasonic meter for liquid and gas.

Single Phase Measurement in a Not So Single-Phase World: The class illustrates the issues and errors encountered when metering techniques suitable for single phase liquid or gas are exposed to two-phase flow conditions that commonly occur in production operations.

Test It/Prove It Software: Demonstration and knowledge sharing class for FlowCal’s meter testing software.

Troubleshooting Liquid Measurement Problems: This class will be a discussion of what to look for and how to troubleshoot common measurement problems in liquid metering.

Ultrasonic Meters for Gas Measurement: Discusses the requirements and use of ultrasonic metering in natural gas applications.

Upstream Gas Sales Verification: This class will cover methods available to verify accuracy of gas measurement.

Water Injection Testing of Liquid Sampling Systems: The process and requirements of certifying and testing liquid sampling systems.

Wireless Sensor Networks– Application in Oil and Gas: This class will provide information on how to use wireless technology in the oilfield.

CCAMS Scholarships Opportunities Available in 2016

The CCAMS will be taking applications for scholarships for the Fall 2016 school year soon. The CCAMS is committed to provide financial support to students who are working toward their college degrees or trade school. We feel that education is one of the most productive things a person can do to better themselves and their community. We are happy to provide worthy students some financial support in their quest for higher learning or skills training. Much of the profit generated from our school goes to students for their education. You don’t have to be a CCAMS member to apply for a scholarship. The scholarship application is located on our website at www.ccams.info.