

## AUDIENCE

This Course is recommended for measurement specialists, technologists and engineers involved in the design, evaluation and/or daily operation of gas measurement systems.

## WHEN AND WHERE

June 8 & 9, 2005

**At Hotel NH Krystal  
Puerto Vallarta, Jalisco.  
México.**

**Course Fee \$ 500 USD**

**Lunch and Coffee is provided**

**All Students attending the course  
will receive a reference workbook  
and will be presented with an  
official Certificate of  
completion**

To register, please complete and return via fax to:

**TransCanada Calibrations Ltd.**

**P.O. Box 654**

**Ile Des Chenes, MB R0A 0T0**

**Attention: Scott Van Achte**

[scott\\_vanachte@tccalibration.com](mailto:scott_vanachte@tccalibration.com)

**Phone: 204-878-4373 Ext. 221**

**Fax: 204-878-4531**

Name \_\_\_\_\_

Title \_\_\_\_\_

Company name \_\_\_\_\_

Address \_\_\_\_\_

E. Mail \_\_\_\_\_

Phone \_\_\_\_\_

Fax \_\_\_\_\_

### COURSE FEE \$500 USD

Payment:

Visa/MasterCard # \_\_\_\_\_

Expiry Date \_\_\_\_\_

Cheque Enclosed: Yes \_\_\_\_\_ No \_\_\_\_\_

Send Invoice to Address Above: \_\_\_\_\_

### **Alternative E-Mail**

[jairo\\_mantilla@transcanada.com](mailto:jairo_mantilla@transcanada.com)

Phone: 403- 920-8116

[wayne\\_haner@tccalibration.com](mailto:wayne_haner@tccalibration.com)

Phone: 204- 878-4373 Ext. 225

## **TransCanada Calibrations and CIATEQ AC.**

**Invite you to attend a course**

## **Gas Measurement with Ultrasonic Technology**



**Two Day Training Workshop**

**June 8 & 9, 2005.**

**Puerto Vallarta, Jalisco, México**

**Hotel NH Krystal.**

**ORGANIZED BY :**



**GAS MEASUREMENT SERVICES**

## **COURSE AGENDA**

### **DAY 1**

#### **Section 1 : Fundamentals**

Topics Presented:

Principles of operation  
Factors affecting Meter Performance  
Temperature and Pressure Influences  
Performance Key Indicators  
Dry Calibration

#### **Section 2: Meter Installation**

Topics Presented:

Highlights of Recommendations and  
Common Practices.

#### **Section 3: Theory on Ultrasonic Meter Calibration**

Topics Presented:

Highlights of Ultrasonic Meter Performance  
in the Laboratory  
Meter Recalibration

#### **Section 4: Ultrasonic Meter Operation. Introduction to Monitoring and Diagnostic Capabilities**

Speed of Sound  
Gain Levels  
Signal to Noise Ratio  
Flow Profile  
Meter Performance  
Raw and Corrected Gas Velocity

### **DAY 2**

#### **Section 5: Ultrasonic Meter Operation : Field Meter Assessment**

Topics Presented:

Review of Meter Log Files  
Diagnostic Parameters and Log Evaluation  
Operational Factors and Meter Performance

#### **Section 6: Real time USM Flow Calibration**

Topics Presented:

Real-time Web-based Remote Calibration at  
TCC's Meter Proving Laboratory in Winnipeg,  
Canada

Log File Evaluation Utilizing Dial-up  
Ultrasonic Meter Capability

#### **Section 7: Ultrasonic Meter Station Assessment**

Topics Presented:

Uncertainty Contributions due Traceability  
and Calibration Procedures  
Temperature, Pressure and Flow Stability  
Conditions During Meter Operation.  
Ultrasonic Meter Station Evaluation

#### **Section 8: Round Table Discussions**

Open Forum for Discussions Relating to  
Ultrasonic Meters, Technology and  
Measurement.

# **Gas Measurement with Ultrasonic Technology**

