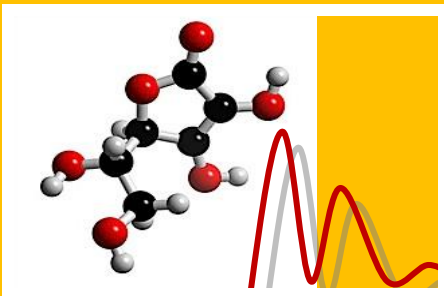
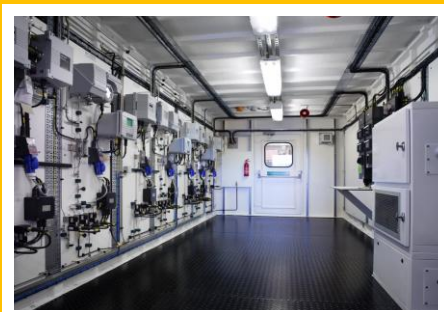


An Intensive School of
Training in



Exclusively Presented by:



Instrumentation & Petroleum
Services Asia Sdn. Bhd.
&
Analyzer Consulting Engineers
LLC, USA

Engineering and Troubleshooting Process Analyzer Systems | 2010

July 26-30, 2010 • Sunway Resort Hotel,
Kuala Lumpur • Malaysia

CAPITALIZING ON OPPORTUNITIES IN ANALYZER SYSTEMS

FAVOURITE TOPIC INCLUDES:

- Introduction to Sampling System
- Advanced Sampling System
- Basic Chemistry for Analyzer
- Basic Gas Chromatography (GC)
- Advanced Process GC

PRESENTED BY
Tony Waters

More than 45 Years of Analyzer Experience

Who should attend

- Process Analyzer Maintenance Technicians
- Plant Analyzer Engineers
- Analyzer Specialists
- Application Chemists
- Analyzer System Design Personnel
- Analyzer Sales Engineers

Register Now!
Call +603-60283649

IPSA • Malaysia

IPSA specializes in engineering, supply, training & commissioning of process and laboratory analyzers systems for refineries, gas processing, petrochemical and industrial plants. IPSA represents Servomex, Petroleum Analyzer Company-PAC (Alcor, Antek, Herzog, ISL, Precision Scientific & Petrospec, Gasmeter FTIR Analyzers, Hoffer Turbine Flowmeters, EFA Pipeline Leak Detection System and Pulp & Paper physical properties testing equipment (Regmed, Technidyne, ACA, OpTest & Pulmac).

ACE • United States

Analyzer Consulting Engineers LLC is a consulting company based in California that specializes in analyzer site surveys, systems engineering and training. Their instructors have trained thousands of people in analyzer application and maintenance throughout the world. This intensive classroom training has been conducted internationally at open seminars like this, at process industry jobsites and also at the ISA Training Centers (USA).

Why Attend This School?

The 2010 Seminar will focus on a detailed understanding of *analyzer sampling systems* and *process chromatographs*, so students will learn how to troubleshoot and improve the reliability of these important instruments. Although these classes are advanced, they start from first principles, so even students having no previous experience with analyzers will rapidly gain valuable knowledge and understanding.

As before, our residential school is an intensive 5-day learning experience, not a nine-to-five classroom. Instruction is by lecture, individual class exercises and project team assignments, some conducted out of class hours. Students will learn from what they hear, but more from what they do. They also learn by working with others who come to the class with different backgrounds and experiences. Bonus events will be offered on certain evenings. Each student will receive a workbook with copies of the presentation materials and many practical class exercises.

It is strongly recommended to attend the whole school as the learning is progressive, including a group project that lasts all week and some evening classes. However, to accommodate those whose schedule does not allow a whole week, an option is available to attend only the first two days focusing on analyzer sampling systems or only the last three days on chemistry and gas chromatography. Many thousands of students worldwide have attended these classes and have given excellent reviews. This is the seventh such presentation in Malaysia.

Seminar Program – Day 1 (Monday – 26th July, 2010)

Introduction to Sampling

We open our seminar with an intensive day of lectures and class exercises introducing the main concepts of effective sampling for process analyzers. It is well known that sampling systems cause most of the problems with process analyzers. By the end of today our students will understand why this is so, and what they can do about it

We start by identifying the objectives that every sampling system must achieve and common reasons for failure. With this understanding, we discuss in detail the location and design of process taps and sample transport lines. No sampling system can succeed if these are not operating correctly.

Monday Evening Event

(8.00 pm – 10.00 pm)

THE CLASS PROJECT

Introduction to the Class Project

Allocation of Team Members

Goals and Expectations

First Project Group Meeting

Program for Monday, 26th July, 2010 (8.00 am – 5.00 pm)

■ What We Need to Achieve

- the objectives of sampling
- compatibility with the analyzer
- getting a timely response
- providing a representative sample

■ Common Technical Issues

- the problem with dead legs
- how to compensate for mixing volumes
- delay caused by adsorption
- contamination by permeation

■ Process Tap Location and Design

- where should the sample be taken?
- how to select an adequate tap location
- how to diagnose a process tap problem
- class exercises to evaluate tap locations
- orientation of process nozzles
- sample probe types and uses

■ Sampling Field Station

- why have a field station?
- difference between gas & liquid samples
- the problem with pressure in lines
- class exercises on gas pressure

■ Troubleshooting Transport Lines

- design parameters of sample transport lines
- principles of single line systems
- principles of fast loop systems
- sample disposal
- d/v and capacity lag considerations
- quick method to estimate lag in installed lines
- class exercises in calculating response times
- class diagnosis of a typical problem

■ Self-Assessment Quiz

- for overnight completion

More Advanced Sampling

Using many class exercises, today's class investigates why sampling systems may fail and introduces several troubleshooting techniques.

We explain how filter, coalescer and separator systems work and how to improve their reliability. Many problems are caused by two-phase samples, so we learn how to avoid condensing a gas sample and how to effectively vaporize a liquid sample. This intensive day ends with a review of multiple stream switching and calibration facilities.

The daily "homework" quizzes give students a chance to test their understanding in a non-threatening way.

Tuesday Evening Event

(8.00 pm – 10.00 pm)

Dinner/Bowling Session

A chance for students to meet each other in an informal social setting

And time to work on the Class Project!

Program for Tuesday, 27th July, 2010 (8.00 am – 5.00 pm)

- **Answers to Overnight Quiz**
 - student self-evaluation & feedback
- **Filters & Separators**
 - two types of filter element
 - probe, fast loop and in-line filters
 - liquid separators and coalescers
 - troubleshooting exercise
- **How to Avoid Condensation**
 - the ideal gas laws – class exercise
 - partial pressure & relative humidity
 - effect of pressure on condensation
 - effect of temperature on condensation
 - how to cause or avoid vapor condensation
- **Project Groups**
 - groups work on their class projects
- **Effective Sample Vaporization**
 - why vaporization is so difficult
 - excessive response time during vaporization
 - sample fractionation during vaporization
 - how to avoid problems
- **Principles of Stream Switching**
 - methods to avoid dead legs
 - methods to avoid cross-contamination
 - double block & bleed
 - calibration and validation samples
 - diagnosing errors in a typical system
 - student design exercise
- **Self-Assessment Quiz**
 - for overnight completion

Seminar Program - Day 3 (Wednesday – 28th July 2010)

Basic Chemistry

Many analyzer technicians and engineers have problems with process analyzers, particularly gas chromatographs, because they do not understand the basic principles of chemistry. Without some knowledge of chemical terminology it is not even possible to understand the analyzer instruction manuals!

This class introduces chemical principles and terminology in an interesting way, with many class exercises using molecular models. The main focus is on hydrocarbons; what they are called, how they are structured and the shorthand symbols often used in process chromatographs.

Wednesday Evening Event

(8.00 pm – 10.00 pm)

CLASS PROJECT TEAM

Design Work

Tony Waters

Resident Instructor

Program for Wednesday 28th July, 2010 (8.00 am – 5.00 pm)

- **Answers to Overnight Quiz**
 - student self-evaluation & feedback
- **Atoms and Molecules**
 - elements and compounds
 - chemical symbols & formulae
 - molecular structures & isomers
 - shorthand symbols used in analyzers
 - class exercises with molecular models
- **Electronic Theory of Atoms**
 - electrons, protons & neutrons
 - formation of an ionic bond
 - properties of ionic chemical compounds
 - nature of the covalent bond
 - properties of covalent chemical compounds
- **Project Groups**
 - groups work on their class projects
- **The Hydrocarbons**
 - names and properties of paraffins
 - names and properties of olefins
 - names and properties of acetylenes
 - cyclic and aromatic compounds
- **Chemical Names & Structures**
 - five simple rules for chemical names
 - how to recognize a chemical from its name
 - how to name an unknown hydrocarbon
 - class exercises with chemical names
- **Converting Units of Measurement**
 - molecular weight & molar volume
 - converting mol, volume & weight units
 - class exercises in units conversion
- **Self-Assessment Quiz**
 - for overnight completion

Basic Gas Chromatography

Process chromatographs are now common in nearly all fluid processing plants, and are often the main focus of analyzer maintenance specialists. Today, we will introduce the basic tenets of process chromatography, but not in a simple way. All students will benefit from this detailed information, those who are new to GC and those with long experience. It is challenging and informative.

This learning is groundwork and an essential prerequisite to Friday's session on troubleshooting chromatographs having multiple column systems.

Time is also allotted for student group discussions.

Thursday Evening Event

(8.00 pm – 10.00 pm)

STUDENT PRESENTATIONS

Students present their team design of an integrated Process Analyzer System

Team Leaders

Program for Thursday, 29th July, 2010 (8.00 am – 4.00 pm)

- **Answers to Overnight Quiz**
 - student self-evaluation & feedback
- **Basic Chromatography**
 - what gas chromatography is
 - history & definition of terms
 - importance of the chromatogram readout
- **Process Gas Chromatographs**
 - GC ovens & electrical safety
 - carrier gas system
 - injection & column switching valves
 - separating columns
 - TCD, FID & FPD detectors
- **How GC Columns Work**
 - how columns are made
 - introduction to gas-liquid equilibrium
 - what really happens inside a GC column
 - understanding the causes of peak shapes
 - understanding the cause of separation
- **Project Study Time:**
 - Class closes early today
 - groups work on their class projects

Advanced Process GC

Process GCs use multiple column systems to achieve fast separations and reliable measurements. Since nearly all chromatographic faults appear on the chromatogram, a skilled analyzer technician will always use it to diagnose problems.

In today's class, our students will be trained to recognize chromatogram symptoms. Many class exercises on real chromatograms are used to practice diagnostic techniques for troubleshooting separation problems. These skills will allow students to read clues from any chromatogram and more easily diagnose problems with the valves, detectors and column systems.

Friday Finale Event

CERTIFICATES

A Certificate of Completion will be awarded to each attendee who completes the school

Thanks for Attending!

Program for Friday, 30th July, 2010 (8.00 am – 5.00 pm)

- **Answers to Overnight Quiz**
 - student self-evaluation & feedback
- **Optimizing CG Performance**
 - how to evaluate column performance
 - set oven temperature for best separation
 - set carrier flow for best resolution
 - how to achieve the fastest analysis
 - many class exercises
- **Backflush Column System**
 - the purpose of backflush
 - typical backflush valve system
 - how to balance the flow rates
 - detailed theory of peak regrouping
 - pressure effects in multiple column systems
 - how to optimize the column lengths
- **Troubleshooting Baseline Upsets**
 - getting a flat baseline
 - what causes all baseline disturbances?
 - how to identify the disturbance
 - diagnosing spikes, peaks, bumps and steps
 - class to diagnose a complex chromatogram
- **Heart Cut Column System**
 - why trace analysis is difficult
 - limitations of backflush
 - the purpose of heart cut
 - typical heart cut valve system
 - simple and complex cuts
 - the role of each column in a heartcut system
 - setting single and multiple cuts
 - understanding peak tails and remnants
 - class diagnostic exercise

Terms and Conditions

Fees:

Tuition fees are payable in advance of attendance, and include all instructional materials, student workbooks, lunch & refreshments each day, and the class dinner on Tuesday night.

Registration:

Early registration is recommended as class sizes are limited. Phone, fax & email registrations are accepted on a first-come basis. Send payment by cheque or by formal company purchase order to:

**Instrumentation & Petroleum Services Asia
Sdn. Bhd. (285745-V)**

13 Jalan Kemboja 1B/2

48300 Bukit Beruntung

Selangor, Malaysia

F: +60 (3) 6028-3650

T: +60 (3) 6028-3649

Discounts:

5% discount is allowed for two or more persons attending from the same company and covered by the same company cheque or purchase order.

Cancellation:

Fees will be refunded only for cancellations received two weeks prior to the seminar start date. A processing fee of RM 500 will be charged.

Substitute attendees will be accepted at any time without charge.

We reserve the right to cancel any class with low enrolment. If so, your fees will be refunded in full.

The Instructor



***Tony Waters** has more than 45 years experience with process gas chromatographs and other analyzers. He has founded three companies to provide specialized analyzer services to the process industries and is an expert in the application of process analyzers in refineries and chemical plants.*

Tony developed these training courses from his long experience in the field. His presentations are always popular, and have equal appeal with engineers and maintenance technicians. The seminar has been presented in Australia and in many of the countries of Asia, Europe, Middle East, North America and South America.

In the advanced gas chromatography class, Tony draws on his fifteen years experience of designing process gas chromatograph column systems. His extensive sample systems expertise comes from designing hundreds of process analyzer systems and from his varied consulting work at refinery and chemical jobsites on five continents.

Registration Form - 2010

Instrumentation & Petroleum Services Asia Sdn Bhd.

Tel: +60 (3) 6028-3649
Fax: +60 (3) 6028-3650
E-Mail: sales@ipsa.com.my
Website: www.ipsa.com.my

13 Jalan Kemboja 1B/2
48300 Bukit Beruntung
Selangor, Malaysia

Attention: Ms Yati

E-mail: frontdesk@ipsa.com.my

Registration Data

please use one form per person

Name _____

Title _____

Company _____

Street or P.O. Box _____

City/State/Zip _____

Email: _____ Tel: _____ Fax: _____

Analyzer Training Seminar 2010 **Engineering and Troubleshooting Process Analyzer System** **Sunway Lagoon Resort, Kuala Lumpur, Malaysia**

Select Your Class

Attendance for the whole school is strongly recommended due to the progressive tuition plan. Tuition fees include all instructional materials, lunch & refreshments, and the class dinner on Tuesday night. Students are responsible for their accommodation and other meals. Please select ONLY ONE option below:

Tick:

**5-day Registration
to Whole School**

RM 6,250

▪ **Monday - Friday
July 26-30, 2010**

*Must check-in on
Sunday evening*

Tick:

**2-day Focus on
Sampling Systems**

RM 3,100

▪ **Monday & Tuesday
July 26-27, 2010**

*Must check-in on
Sunday evening*

Tick:

**3-day Focus on
Chemistry & PGC**

RM 4,550

▪ **Wednesday - Friday
July 28-30, 2010**

*Must check-in on
Tuesday evening*

Note: Student may make own reservation or call us for assistance.