PAT Roundtable:

Chemical Industry Process Analyzer Roundtable

Steve Wright
Eastman Chemical Co.

History

- Founding members Air Products, Dow Chemical, Dow-Corning, DuPont, Eastman Chemical, Exxon, Hercules, Procter & Gamble, Rohm & Haas, Union Carbide (now Dow).
- First met in mid-90's.
- Goals: to share non-competitive knowledge to further effectiveness of process analytics in chemical industry.

History, con't.

- Met yearly at host plant
  - Dow, Air-Products, Rohm & Haas, Eastman.
  - Costs host about $7-10K
  - Minimal/token charge: $75-$150 per attendee.
- Regularity goes up/down with the chemical industry financials!
  - Next Roundtable scheduled for April 2006 at Dow.
  - Eastman 2007 – proposed.

“Rules”

- No common notes are issued.
  - Individuals take their own notes can do with them as they please.
- Discuss nothing that could be construed as collusionary:
  - No pricing.
  - No mention of specific vendors, etc.
- Invitation by existing membership.

Unofficial “Rules”

- Meet, greet your colleagues
  - No ties..
  - We are a very small group – “everyone’s there”!
  - Great networking tool.

Historical Areas for Discussion

- Common Safety Issues
- Common Training Issues
  - Academic level
  - Trade level
- Common vendor specifications
  - Process Industry Practices (PIP)
- Benchmarking so-called “best practices”

PIP Project Specifications

- Large Billion Dollar Scale Plants Constructed by Limited Number of “Mega Contractors”
- Each Client “spoke” a different specification language
  - Difficulty for contractor staffs to work cross-company projects
  - Joint Ventures were also difficult
  - Duplicity, errors, wheel reinvention common
  - **BIG Costs!**

PIP

- Many other construction practices defined – piping, electrical, etc.
- Analyzers were left out..
- Process Control / Process Analyzers
  - Group effort – starting with roundtable companies.
  - Now, large multi-company effort.
- Estimates up to 6% installation savings.
- http://www.pip.org

Process Industry Practices: PIP

- PCCA001 - Design of Combustible and Toxic Gas Detection Systems
- PCCA01D - Data Sheet for Combustible and Toxic Gas Monitors
- PCCPA001 - Process Analyzer System Design Criteria
- PCEPA001 - Process Analyzer System Engineering Guidelines
- PCEPA002 - Process Analyzer Project Implementation Guidelines
- PCIPA001 - Process Analyzer System Field Installation
- PCSPA001 - Process Analyzer Project Documentation Data Sheet Instructions
- PCSPA002 - Process Analyzer System Data Sheet Instructions
- PCSPA003 - Process Analyzer Shelter Data Sheet Instructions
- PCSPA004 - Process Analyzer Bid Proposal Data Sheet Instructions
- PCSPA01D - Process Analyzer Project Documentation Data Sheet
- PCSPA02D - Process Analyzer System Data Sheet

  PCSPA03D - Process Analyzer Shelter Data Sheet
- PCSPA04D - Process Analyzer Bid Proposal Data Sheet
- PCSPA2DA - Process Analyzer System Data Sheet Part II - Stream-Specific Information
- PCTPA001 - Process Analyzer System Acceptance Testing

PIP Member Companies

- 3M Company
  Advanced Silicon Materials LLC
  Aramco Services Company
  Arkema
  B P
  Celanese Ltd.
  Chevron Corporation
  CITGO Corporation
  ConocoPhillips
  Cytec Industries
  Degussa Corporation
  E.I. DuPont de Nemours & Co., Inc.
  Eastman Chemical Company
  Flint Hills Resources, LP
  FMC Corporation
  Great Lakes Chemical Corporation
  Honeywell
  HOVENSA L.L.C.
  Huntsman Corporation
  Monsanto Company
  PPG Industries, Inc.
  Rohm and Haas Company
  Shell Oil Company
  Solutia Inc.
  Sunoco, Inc.
  UOP LLC

Education: PAPAC

Practical Aspects of Process Analytical Chemisty

- Who is training new process analyzer chemists/engineers?
- Few recognized programs.
- Initiated by Dow Chemical Co.
- Dr. Lynn Melton – Univ. Texas Dallas
- MCEC / CPAC
- Fifteen undergrad college professors attended first course at Dow.
- http://www.utdallas.edu/~melton/acs-3-01-papac-ched.pdf

PAPAC, con't

- Eastman Chemical hosted next PAPAC, with 15 professors in attendence for a three day course.
  - Cost to professors – two promises..
    - Include on-line analysis in their undergrad curricula.
    - Textbook writers – include a chapter dedicated to on-line analysis in their books.
- Who is next? Pharma?

Benchmarking

- Benchmarking is another roundtable function.
  - By agreement, for member use only.
  - Issues centered on three main issues:
    - ROI (theory vs practice)
    - Maintenance practices
    - Training issues
  - Launched several company-to-company benchmarking efforts, including site visits.

Chemical Industry Roundtable

- Hasn’t been as active as in past – trying to change this:
  - Dow in Spring 2006
  - Eastman (?) in 2007
- Lots of retirements
- Less “benchmarking” activity –
  - What works at Company X, doesn't necessarily translate to Company Y

Process Analytics ..

Moving from Ideas to Money-Making Installations

Process Analytical at Eastman Chemical

- One of the largest single sites for chemical production in the USA.
- Longstanding analyzer effort.
- About 1200 on-line chemical analyzers and sensors at our main Kingsport, TN location.
- Many are process/life-critical with mandatory high availability up-times.

What makes us different..

- Chemist-Driven analyzer groups.
- We have few, but very large plant sites.
- Consider analyzers an extension of our traditional laboratories.
- We "own" analyzers from inception to dumpster installation (hopefully 20 years later).
- As long-term owners, we understand maintenance/calibration and build that into our installations.

Discussion

Discussion Drivers/Ideas

- Verbal poll of group
- Analyzer project justification.
  - ROI drivers
  - Vertical Salesmanship/Education!
- Analyzer ownership issues
  - Development (Chemists, Engineers)
  - Maintenance approaches
    - Staffing – what makes a group effective?
    - Computerized Maintenance Management Systems (CMMS) with 21CFR11 compliance
- General Discussion