Modular Sampling System Initiative

ISAEXPO2000 Meeting
Center for Process Analytical Chemistry
ISA Analysis Division
Agenda

1. Overview and Background  
   Peter van Vuuren

2. Definition of a Smart Sample System  
   Rob Dubois

3. Analyzer Function Block Matrix  
   Rob Dubois

4. ISA SP76 Interface Standard  
   Dan Podkulski

5. Request for Proposals & Questions  
   Peter van Vuuren

6. Break-out Groups  
   All

7. Wrap-up and Next Step
Overview & Background

Typical Surface Mounted Stick Exploded View

Pictures Courtesy John Thomas, Parker Hannifin Corp
Overview & Background

• Facilitate the acceptance and implementation of modular SS technology in the Petrochemical Industry

• Promote the concepts of:
  small, smart, integrated sampling and sensor transmitters
  smart analyzer transmitters

• Lay the groundwork for the next generation of Process Analytical Systems:
  open connectivity architecture (Ethernet, TCP/IP, wireless etc.)
  industry standard protocols (OPC, Fieldbus, Profibus, Hart, etc.)
  web enabled technologies (browsers, HMI, I/O servers, etc.)

• Longer Term: Modular systems provide bridge between the Macro World of Process Streams and the Micro world of new generation of Micro Fluidic/Analytical Systems (e.g. analyzers on a chip, sensors on a chip, lab on a chip, etc.)
Driving Forces for Change

- Reduce Cost to Build
  Design, Engineering, Manufacturing, Installation, Etc.

- Reduce Cost of Ownership

Maximize Sustained “Fit for Use” Data Generation

System Validation

- Representative Sample Validation
- Measurement (Data) Validation
- Communication Validation
Integration of Sample System and Sensors

- **A**: Analyzer
- **P**: Controller
- **T**: Field LAN
- **F**: Sample Conditioning System

**All System Components in Contact with Sample including the Sensors**

**Level 0**: All System Components in Contact with Sample including the Sensors

**Level 1**: All Additional Electronic and Computing Components Required to Generate Analytical Result

**Analyzer Controller**

**Mainly a Trust Configuration**

**Now a Trust & Verify Configuration**

- **dc**: dcs
- **o&m**: o&m user
Integration of Level 0/1 Subsystems

Integrated Analyzer Transmitter

Level 0
Level 1

SS/Analyzer/Com Controller

Control
Compute
Communicate

Process Stream

Field LAN

dcs

Modular Sampling System Initiative

CPAC/ISA: August 23, 2000
Sensor = Moisture Probe

Original Picture of Gas Delivery System courtesy Valin Corporation;

Integrated Analyzer Transmitter
Imagine the Future

Integrated Sampling/Sensor Transmitter

Sensor = RAMAN Probe
Imagine the Future
Goals

- **Modular Sample System Designs**
  Adapt for Chemical Industry (traditional -> modular)
  Ready for Prime Time?

- **Integration of Sensors (Plug and Play)**
  Smart Sample/Sensor Systems
  Integrated Analyzer Transmitter
  Integrated Sample/Sensor Transmitter
  Validation of Representative Sample
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## Request for Proposal

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Request for Proposal

- **Expectations** *(See A1.2, Attachment 1)*
  - functional equivalency
  - + innovation
  - auto-sensing of leakage
  - automation of maintenance functions etc.

- **Due Date: October 15**

- **Deliverable: Workgroup Report**
  - Summarize the Designs
  - Assess the viability of modular designs
  - Identify areas in need of development
  - Identify areas/process for further standardization
  - List of suppliers

- **Encourage**
  - Collaborative efforts
  - Comments
Request for Proposal
Agenda Topics

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PART II - Break-Out Groups

30 minutes will be allocated to each topic. Participants will be broken up into 3 equal groups. Each group will have a facilitator.

At the end of 30 minutes, each spokesman will have 10 minutes to present each group's viewpoints starting with Group 1.

One rule: there are no rules...other than this is not meant as a debate but rather a free and open exchange of ideas "if everything was assumed to be achievable”

Comments from these break-out groups will be collected and distributed to all participants. Each group should have a scribe to take all comments (volunteers will be appreciated).
Group 1 & 2. **Barriers**

Question:

*What are the barriers to the NeSSI concept and how do we overcome them?*
Group 3. **User Interface**

**Question:**

*What additional standardization should be considered for the coexistence of user interfaces at the local and remote user interface levels (communications, workstation platforms, etc.). How do we prevent an Analyzer Tower of Babel?*
Group 4. **Smart Applets**

Question:

*How do we create and disseminate "Standard Smart Applets" to the Process Analyzer industry? Modular Software, Proprietary vs Open?*
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1. Workgroup Report - Nov (Postponed Until after IFPAC2001)

2. Follow-up Session at IFPAC2001


4. Food for Thought:

   Foundation for Process Analytics?
Acknowledgements

Thank You!