Achieving the NeSSI™ Vision in Our Lifetime

Moving Beyond Gen II

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The Original Vision: IFPAC 2000

[Process Analytical Systems - A Vision for the Future]

- Plenary Paper, IFPAC 2000
- Jeff Gunnell & Peter van Vuuren

Articulated a comprehensive vision for the future of process analytics
- A new paradigm
Looking Forward to January 2000

Original vision was framed first/last in economic terms...

First paragraph of the ABSTRACT

“In our highly competitive commercial world companies continue to demand decreased costs, lower staffing levels and industry standard designs; each part of every business is being challenged to deliver improvements which lead directly to better returns for the company.”

Last paragraph of the article’s SUMMARY

“This new [paradigm], with decreased costs of implementation and ownership and with improved analytical capability, will lead to a further flourishing of the discipline of Process Analytics. There will be more analytical systems, making more complex measurements in more plants. Growth in the Process Analytics industry will exceed that of related disciplines.”
Ahead to January 2000

...but also was infused with optimistic expectation for achieving economic objectives through pipe-centric technology.

- Robust sensors
- Integrated with their own process interfaces
- Located at/on the process pipe
<table>
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<tr>
<th>Goals</th>
<th>How</th>
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<tr>
<td>To reduce the cost to build</td>
<td>• Standardization, reducing design and engineering time</td>
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<td>• Simplified assembly, reducing manufacturing costs</td>
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<td>• Less field infrastructure, reducing construction costs</td>
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<td>To reduce the cost to operate</td>
<td>• Faster, easier predictive maintenance, reducing technician time</td>
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<td>• Remote connectivity, reducing engineering support time</td>
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<td>• Smart diagnostics, improving maintenance efficiency</td>
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<td>To increase the credits</td>
<td>• Higher reliability, delivering valuable data for more of the time</td>
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Thirteen years hence, the NeSSI™ vision remains visionary

The fact that we’re here discussing NeSSI™ at IFPAC 2013 attests to...
  – the merit of the vision as originally articulated in 2000
  – a still-unmet need
  – a general consensus at the end-user level (the market)

The original NeSSI™ vision is a call to enable efficient analyzer technologies with process interfaces optimized for given measurement applications
Looking Ahead

- NeSSI™ is at a crossroads
  - How do we overcome the momentum of the established paradigm?
- Two key objectives
  - Short term: get traction based on accomplishments to date
  - Long term: create motivation amongst customers, vendors, and especially new-technology developers to embrace/pursue the NeSSI™ vision
- Accomplish both through a set of principles that codify the attributes of “NeSSI™-compliant” analyzer systems
- But... such a standard already exists
Paleontological Considerations

Panel Discussion, ISA AD April 2011
– An Evaluation Form (A Scorecard)
– A sequel to IFPAC 2011, “Are There Dinosaurs Among Us?”

7 Categories, 33 Criteria, 141 Attributes
– Installation Factors
– Data Communication Factors
– Support Infrastructure Factors
– Process Compatibility Factors
– Process Measurement Factors
– Performance Factors
– Advanced Features
Analyser Systems in 2030: A Vision

Arno van Adrichem, CPAC NeSSI™ Fall Meeting 2012

View analyzer systems through three lenses
  – Field Considerations (19)
  – Maintenance Office Considerations (7)
  – Engineering Office Considerations (8)

Summary
  – Long(er) equipment lifetime
  – Highly intelligent systems
  – Remote and wireless access
  – One stop shop for maintenance (in both the field and office)
  – Cradle to grave system approach
Observations. 2.

- An fundamental incongruity
  – The quest for reliable, intelligent sampling systems...
  – ...that enable analytical technologies that are not.
- The fundamental objective of NeSSI™: the enablement of an outcome rather than a means
The Principle of Correspondence

- Reliability starts with the analytical technology
- Diagnostic Perspective:
  - If a technology is unreliable, no motivation exists to create a process (sampling) interface that is reliable
- The appropriate goal of NeSSI™ not the enablement of conventional technologies but the enablement of NeSSI™-compatible technologies