

The History and Future of Process Management

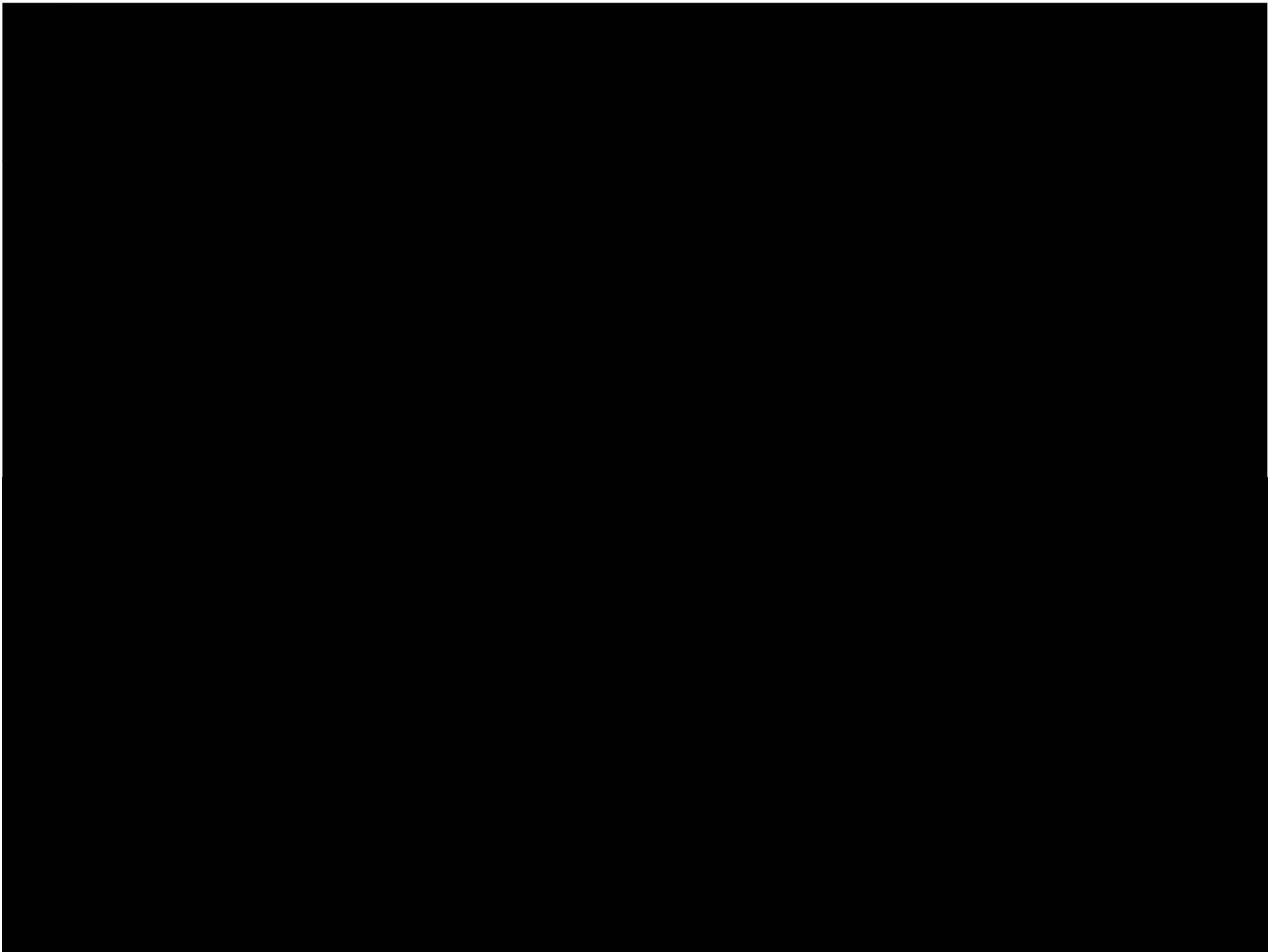
Robert Garston

Director – Wireless & Technology

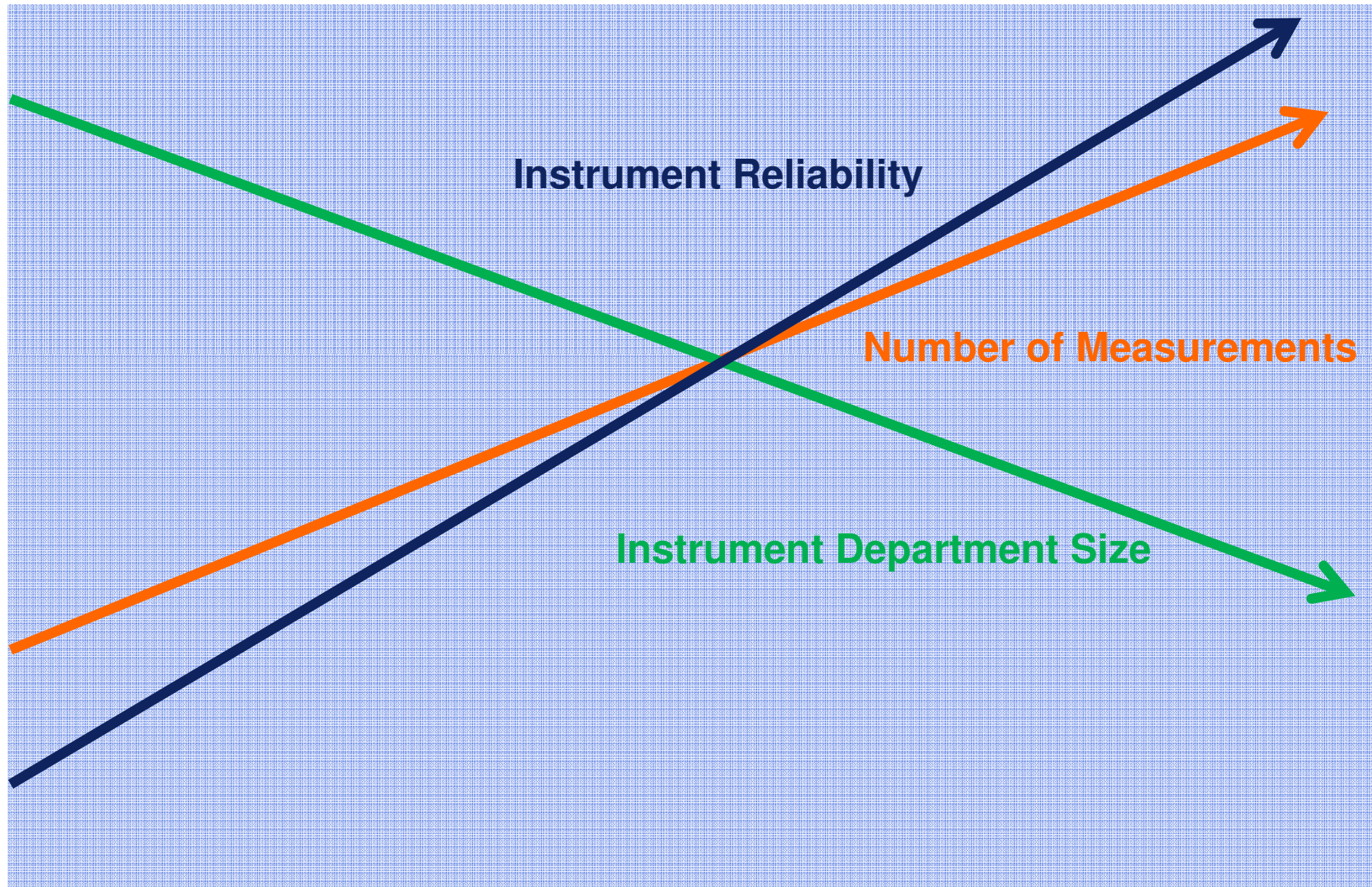
Emerson Process Management

Asia Pacific

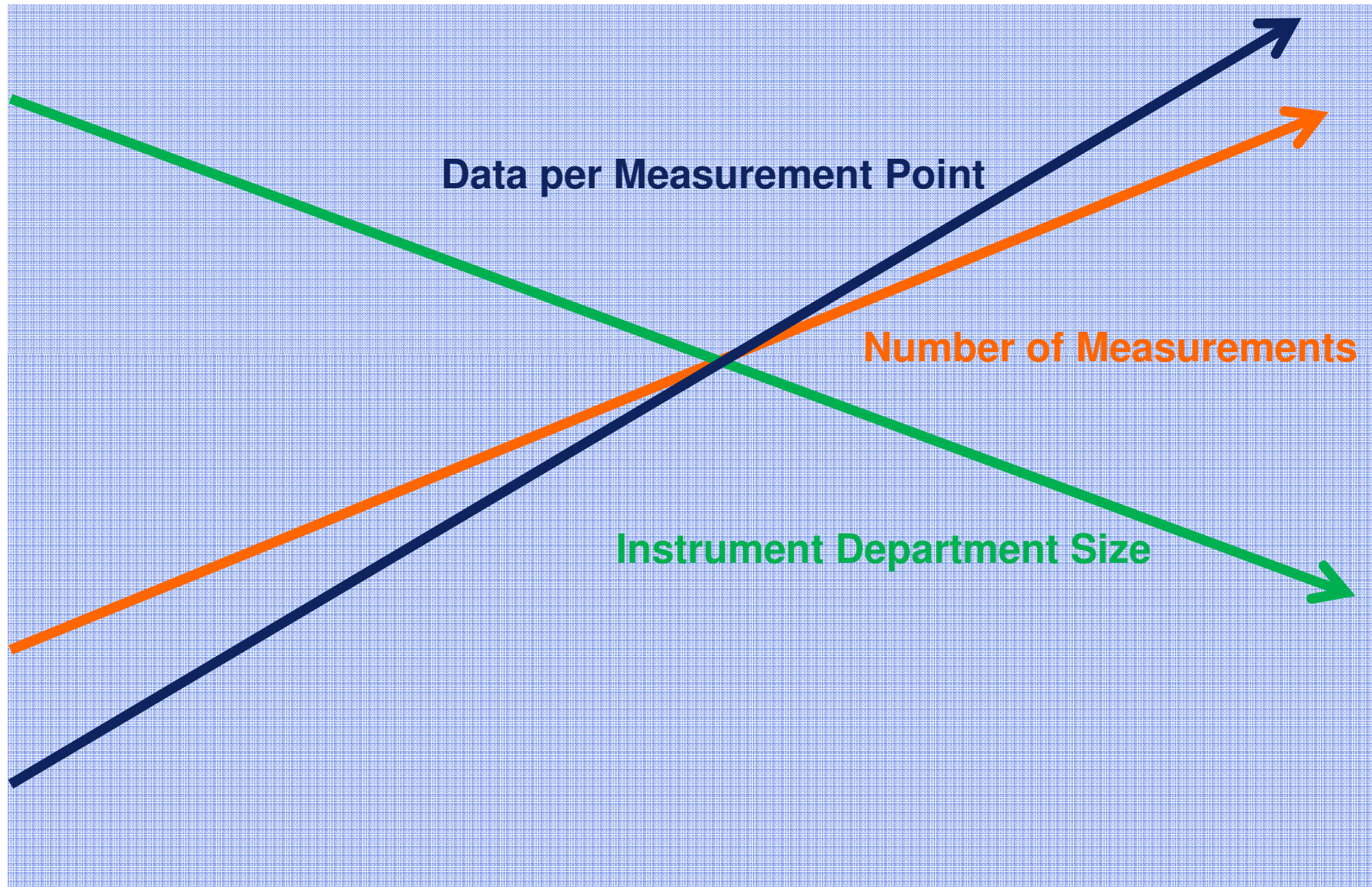




Macro Trends in Our Industry



Macro Trends in Our Industry



Instrumentation and Control History



Pressure
signal

Pneumatic

1950



4-20 mA
Primary
Variable

Analog

1969



Multiple
Variables +
Information

Digital

1988



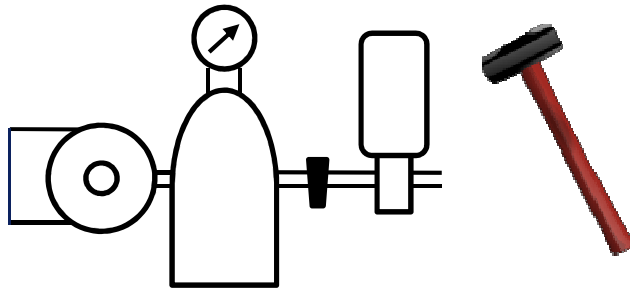
Exponential
Data Points

Wireless

2007

Life of an I&E Technician 60 Years Ago

Installation and Tools



Expertise

- Mechanical

Instrument Output



- 0-100% of Range

Tasks

- Chasing down air leaks
- Calibrating instruments to fit 0-100" in order to fit 0-100% charts

1950

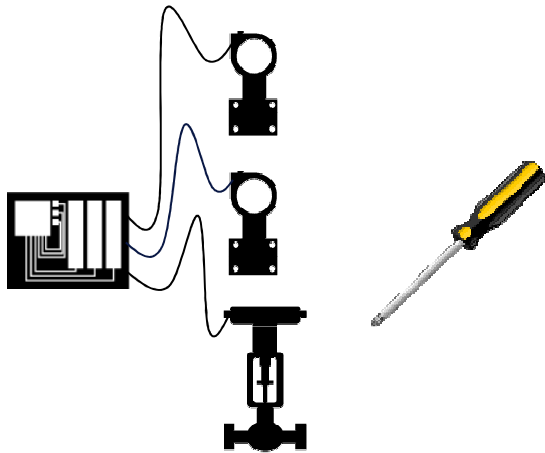
1969

1988

2007

Life of an I&E Technician 40 Years Ago

Installation and Tools



Expertise

- Mechanical
- Electrical

Instrument Output



- 4-20mA (PV)

Tasks

- Seasonal Calibrations
- Configuring range values to 4 & 20mA
- Repair

1950

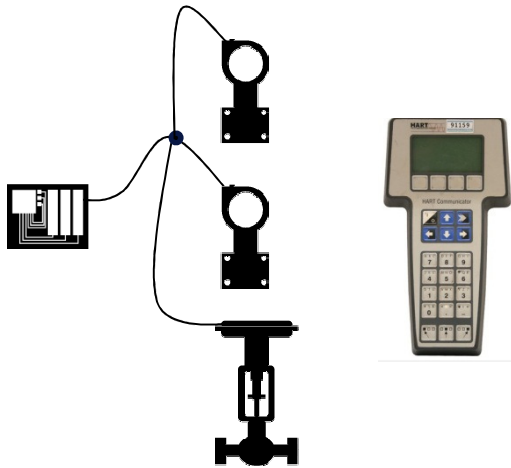
1969

1988

2007

Life of an I&E Technician 20 Years Ago

Installation and Tools



Expertise

- Mechanical
- Electrical
- Software

Instrument Output



- 4-20mA (PV)
- Digital measurements (Up to 4 variables)
- Signal Health
- Instrument Diagnostics
- Lots of information via HART, not particularly well used.

Tasks

- Configuring instrument based on desired engineering units
- Downloading device descriptors
- Troubleshooting issues using diagnostics
- Part Swaps

1950

1969

1988

2007

Life of an I&E Technician Today

Installation and Tools



Expertise

- Mechanical
- Electrical
- Software
- Networks

Instrument Output



- 4-20mA (PV)
- Digital measurements (Up to 8 variables, wired or wireless)
- Signal Health
- Instrument, Process and Loop Diagnostics
- Battery life

Tasks

- Configuring instrument based on desired engineering units using dashboard interfaces
- Downloading device descriptors
- Troubleshooting issues using diagnostics
- Setting up wireless networks
- Repair by Replacement

1950

1969

1988

2007

Advances in Instrumentation Has Added Value to the I&E Tech's Role

I&E Tech's Capability Today

- Take multiple measurements at a single point
- Install more points to improve process visibility
- Ensure your measurement quality
- Troubleshoot device issues such as sensor over temp
- Detect process issues such as entrained air or plugged impulse lines
- Diagnose electrical loop issues due to corrosion, bad wiring or failing power supply
- Keep your measurements online
- Help design information networks vs. routine rounds and periodic maintenance
- Understand and properly apply instrumentation in safety loops

Impact

- Improved **performance**
- Increased **availability**
- Improved control **reliability**
- More **efficient** work orders
- Improved process **quality**
- Verified infrastructure **reliability**
- Increased **availability**
- Increased **availability**
- Ensuring **safe control**



Optimizing process control

1950

1969

1988

2007

Instrumentation and Control History



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Exponential
Data Points

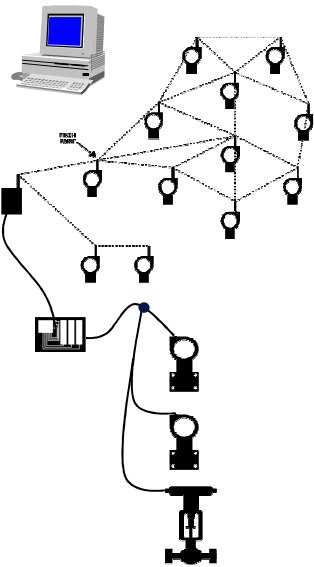
Wireless

2007

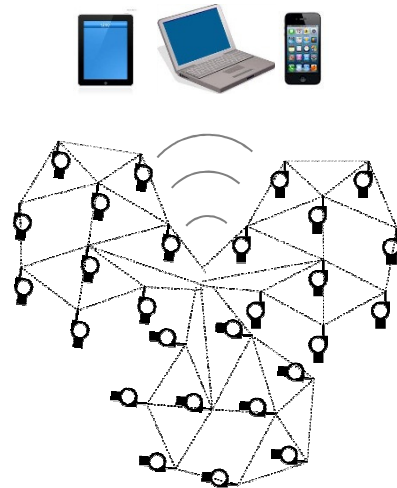
What's Next?

Wireless Instrumentation Will Go Beyond Process Control to Help Solve Key Challenges

Turning Exponential Data into High Value, Accessible and Actionable Information



Control Loop



High Value Information



Safety

Comprehensive Safety Monitoring



Energy

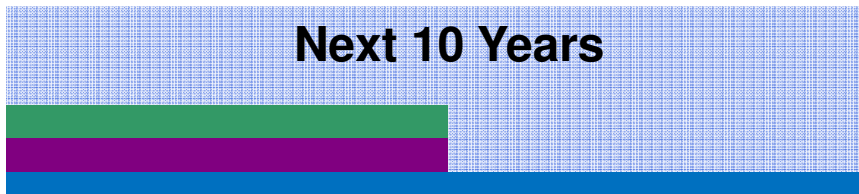
Complete Energy Management



Availability

Total Asset Protection

Next 10 Years



What's Possible Today: Wireless Safety Shower Monitoring

Situation

Common in plants where corrosive materials are present (1000 per plant)

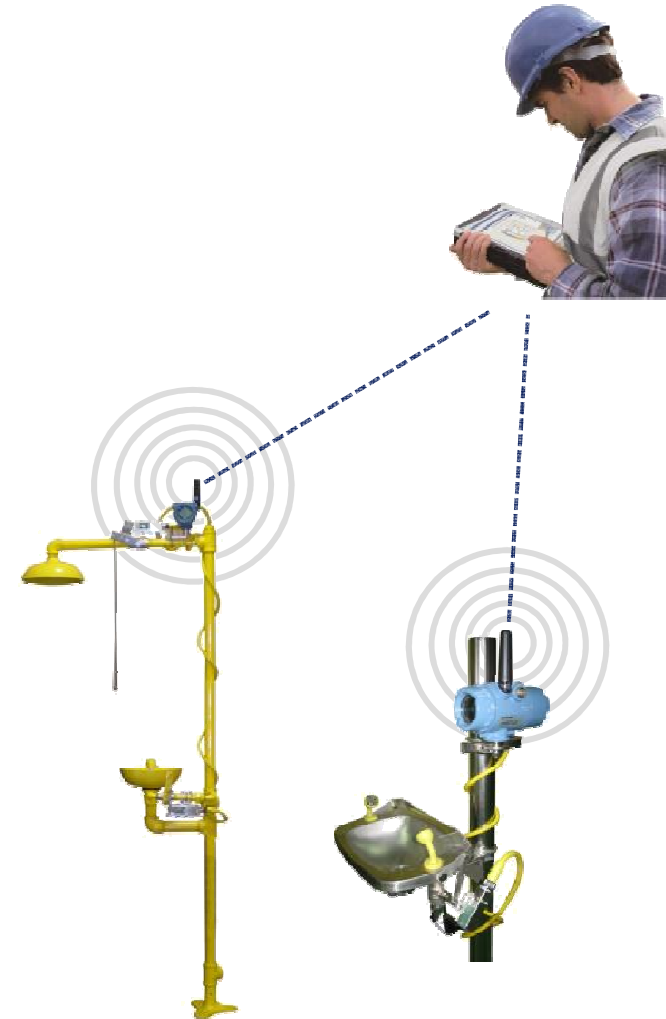
Customer Challenge

Difficult to monitor these devices

- Limits safety team response time
- Inaccurate recording of events

Smart Wireless Solution

- Senses the activation of a shower
- Instantly transmits a notification over a Smart Wireless network to emergency personnel
- Captures time stamped data for incident reporting & safety compliance audits



**Rosemount 702 Wireless
Discrete Transmitter
& TopWorx® GO Switch**

What's Possible Today: Essential Asset Monitoring – Heat Exchangers

Situation

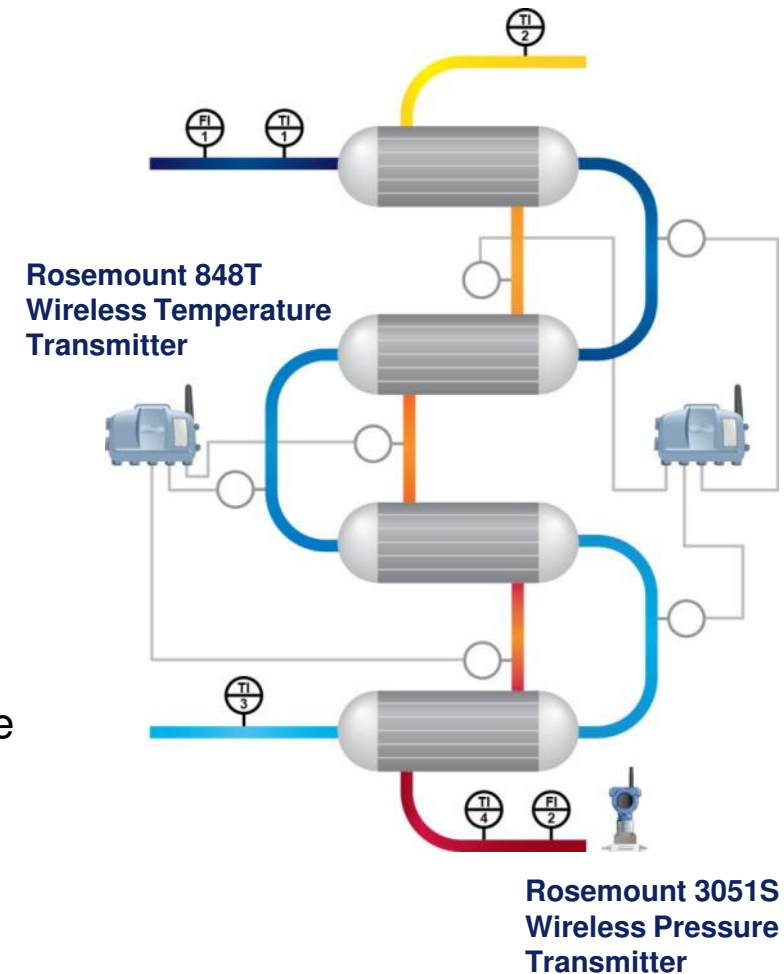
- Heat exchangers are designed to transfer heat from one medium to another
- Widely used in all process industries to heat and cool process fluids

Customer Challenge

- Tube fouling reduces the efficiency of the heat exchanger unit
- Critical Temperature and Pressure Differential measurements are manually monitored due to wiring costs

Smart Wireless Solution

- Smart Wireless transmitters provide cost effective and easy monitoring of individual exchangers for fouling
- Dynamic real-time temperature and pressure measurements are trended and analyzed, delivering alerts in advance of fouling



What's Possible Today: Wireless Steam Trap Monitoring

Situation

- Typical Plant Energy Bill: \$20-30M / year
- 5-10% of total energy costs are typically lost through leaking steam traps (100-500 critical traps)

Customer Challenge

- Limited visibility to steam trap conditions
 - Difficult to access, manual monitoring required
- Installing systems is time consuming and expensive

Smart Wireless Solution

- Wireless acoustic “listening” to monitor steam trap states (normal, stuck closed or stuck open)
- Non-intrusive; no need to cut into pipes
- Proven technology that is easy and inexpensive to install and maintain



Rosemount® 708
Wireless Acoustic
Transmitter

A screenshot of a software interface showing a list of steam traps with their status (Normal, Stuck Closed, Stuck Open) and a legend for the status indicators.

Trap ID	Trap Name	Trap Type	Trap Status	Trap Location	Trap Notes
101-1	101-1	101-1	Normal	101-1	
101-2	101-2	101-2	Normal	101-2	
101-3	101-3	101-3	Normal	101-3	
101-4	101-4	101-4	Normal	101-4	
101-5	101-5	101-5	Normal	101-5	
101-6	101-6	101-6	Normal	101-6	
101-7	101-7	101-7	Normal	101-7	
101-8	101-8	101-8	Normal	101-8	
101-9	101-9	101-9	Normal	101-9	
101-10	101-10	101-10	Normal	101-10	
101-11	101-11	101-11	Normal	101-11	
101-12	101-12	101-12	Normal	101-12	
101-13	101-13	101-13	Normal	101-13	
101-14	101-14	101-14	Normal	101-14	
101-15	101-15	101-15	Normal	101-15	
101-16	101-16	101-16	Normal	101-16	
101-17	101-17	101-17	Normal	101-17	
101-18	101-18	101-18	Normal	101-18	
101-19	101-19	101-19	Normal	101-19	
101-20	101-20	101-20	Normal	101-20	
101-21	101-21	101-21	Normal	101-21	
101-22	101-22	101-22	Normal	101-22	
101-23	101-23	101-23	Normal	101-23	
101-24	101-24	101-24	Normal	101-24	
101-25	101-25	101-25	Normal	101-25	
101-26	101-26	101-26	Normal	101-26	
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101-42	101-42	101-42	Normal	101-42	
101-43	101-43	101-43	Normal	101-43	
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101-45	101-45	101-45	Normal	101-45	
101-46	101-46	101-46	Normal	101-46	
101-47	101-47	101-47	Normal	101-47	
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101-84	101-84	101-84	Normal	101-84	
101-85	101-85	101-85	Normal	101-85	
101-86	101-86	101-86	Normal	101-86	
101-87	101-87	101-87	Normal	101-87	
101-88	101-88	101-88	Normal	101-88	
101-89	101-89	101-89	Normal	101-89	
101-90	101-90	101-90	Normal	101-90	
101-91	101-91	101-91	Normal	101-91	
101-92	101-92	101-92	Normal	101-92	
101-93	101-93	101-93	Normal	101-93	
101-94	101-94	101-94	Normal	101-94	
101-95	101-95	101-95	Normal	101-95	
101-96	101-96	101-96	Normal	101-96	
101-97	101-97	101-97	Normal	101-97	
101-98	101-98	101-98	Normal	101-98	
101-99	101-99	101-99	Normal	101-99	
101-100	101-100	101-100	Normal	101-100	



What Does That Mean For Us

- Greater scope, responsibility and opportunities
- Increased need for
 - Business understanding
 - Comfort in the Digital Age
 - The ability to apply instrumentation in new and creative ways