

# ***The History and Future of Process Management***

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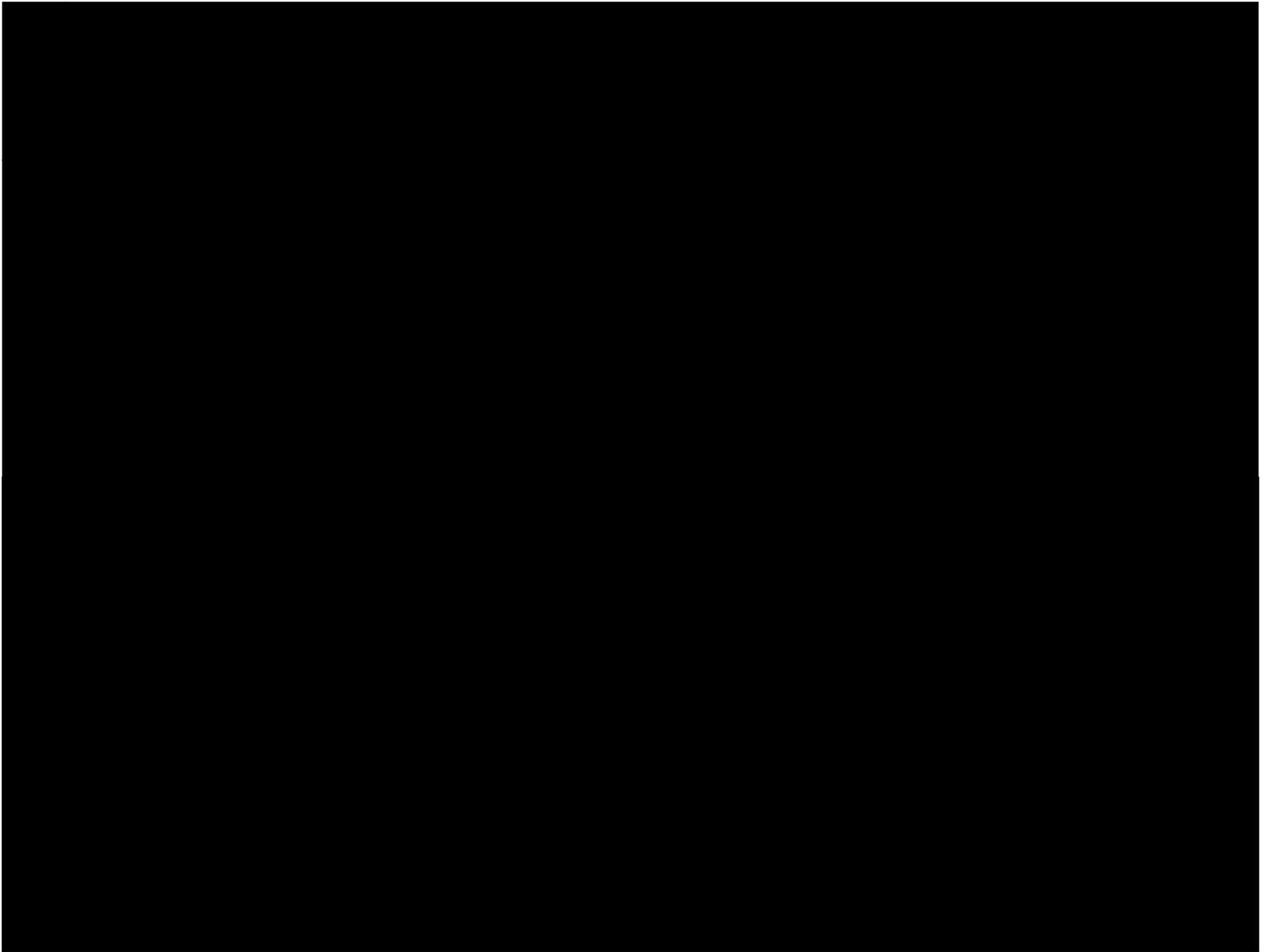
**Robert Garston**

**Director – Wireless & Technology**

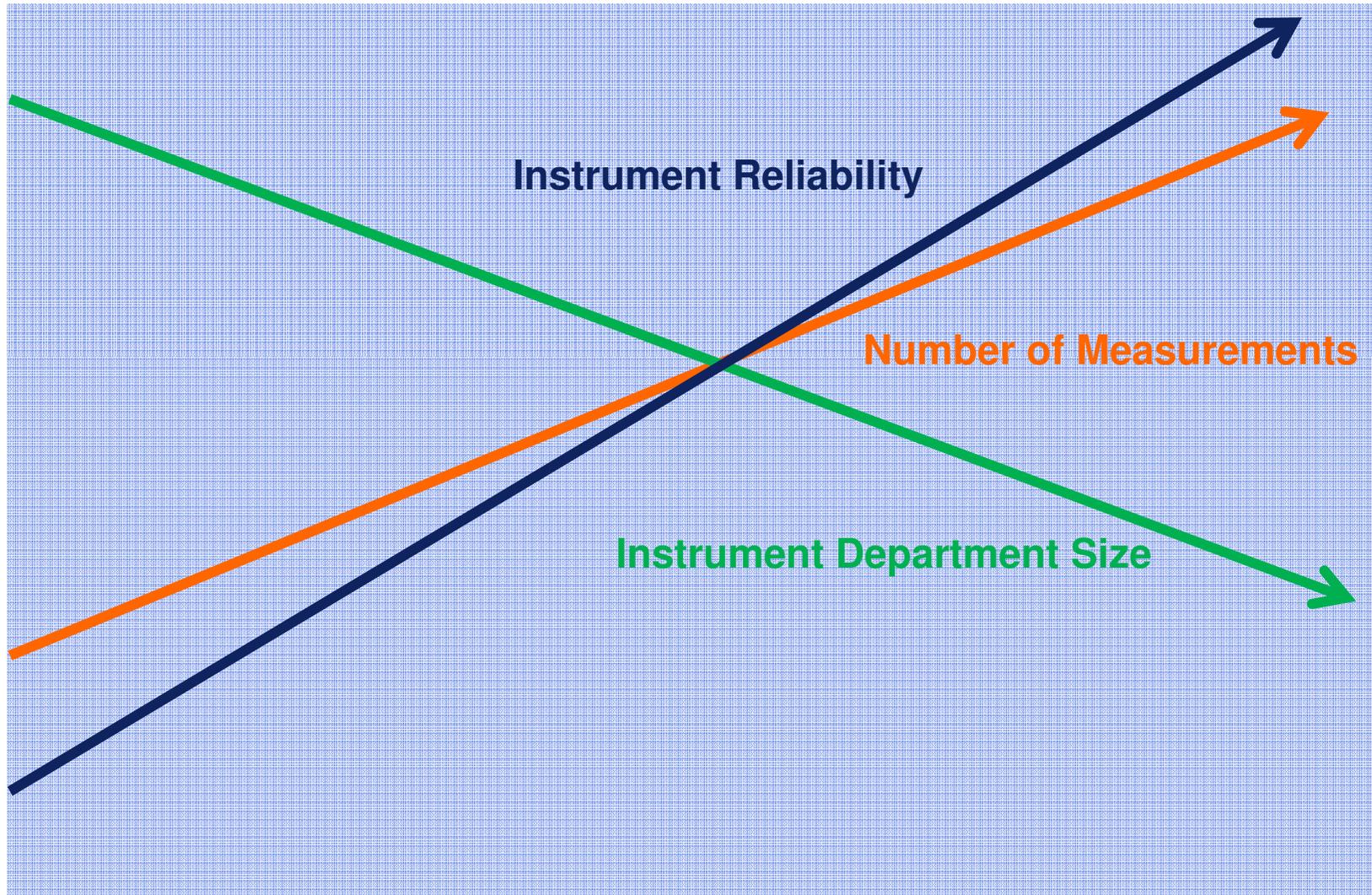
**Emerson Process Management**

**Asia Pacific**

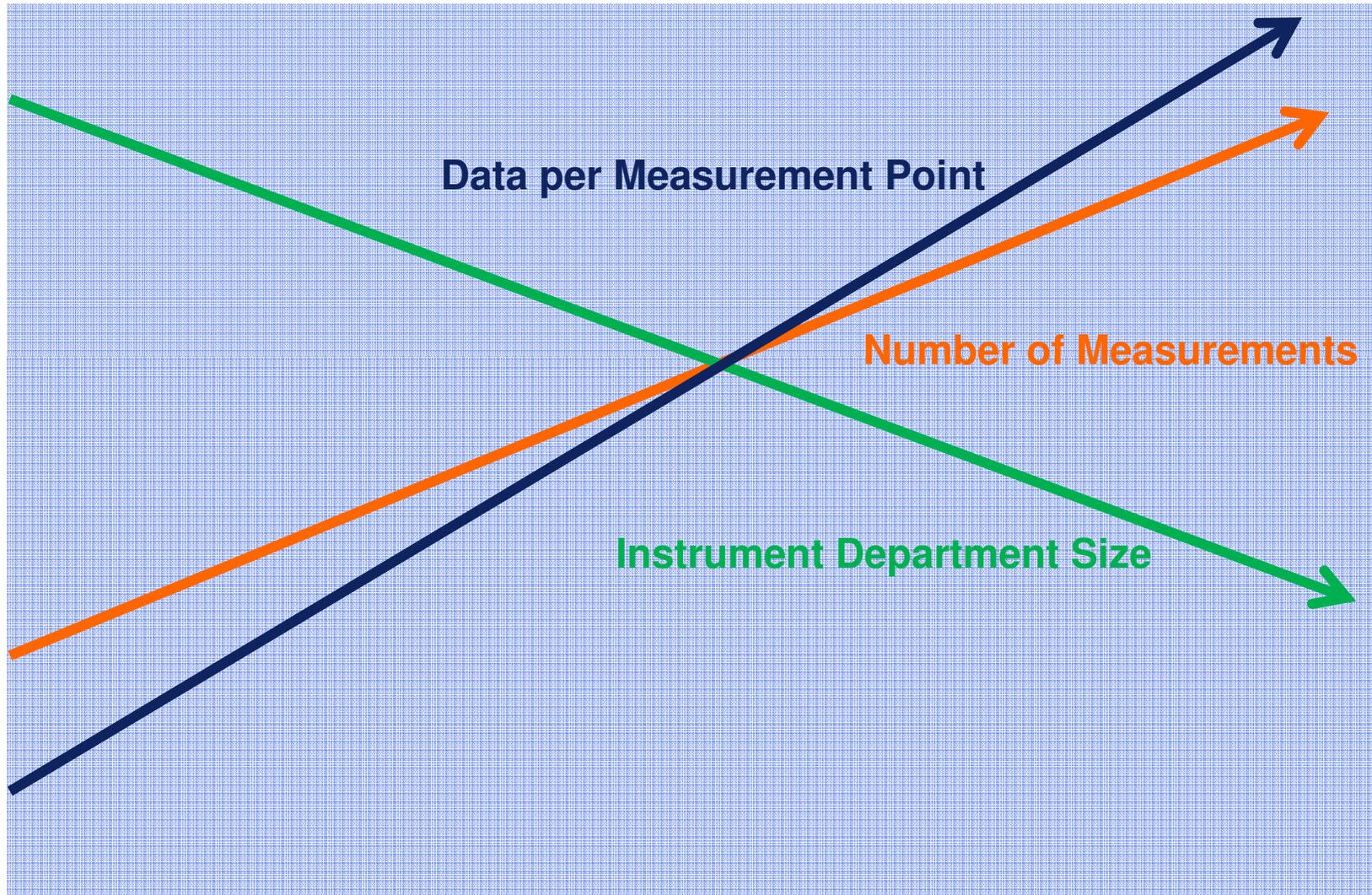




# Macro Trends in Our Industry



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# Instrumentation and Control History



Pressure  
signal

*Pneumatic*

1950



4-20 mA  
Primary  
Variable

*Analog*

1969



Multiple  
Variables +  
Information

*Digital*

1988



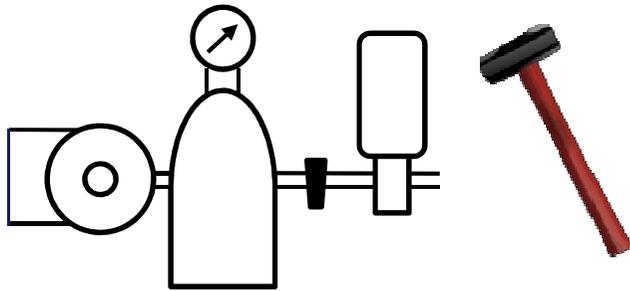
Exponential  
Data Points

*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

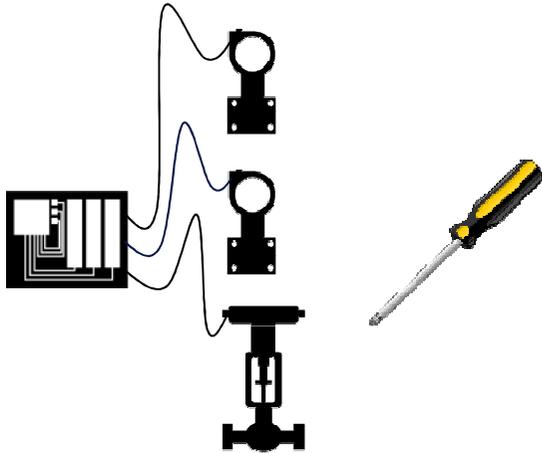
1969

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

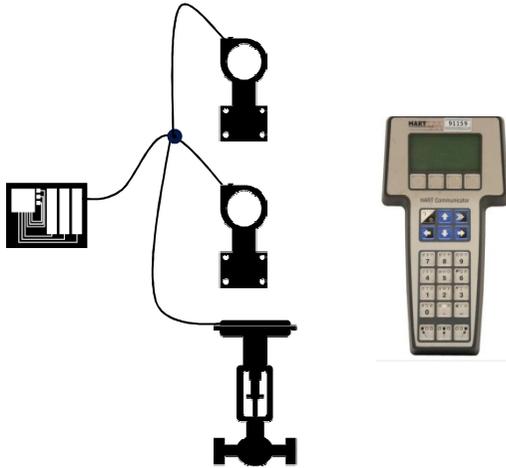
1969

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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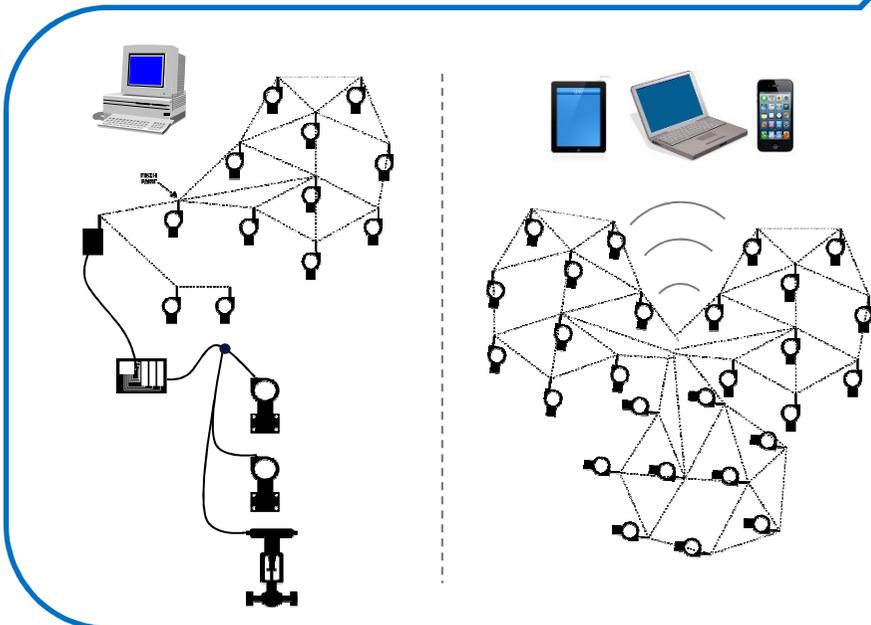
*Wireless*

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*



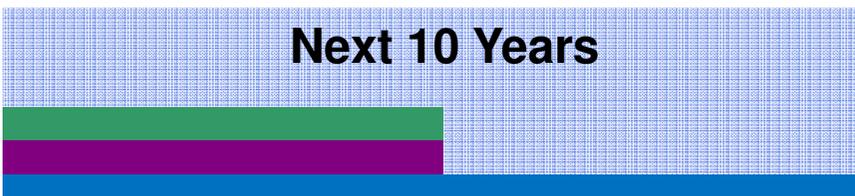
Control Loop

High Value Information

**Safety**  
Comprehensive Safety Monitoring

**Energy**  
Complete Energy Management

**Availability**  
Total Asset Protection



# What's Possible Today: Wireless Safety Shower Monitoring

## Situation

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

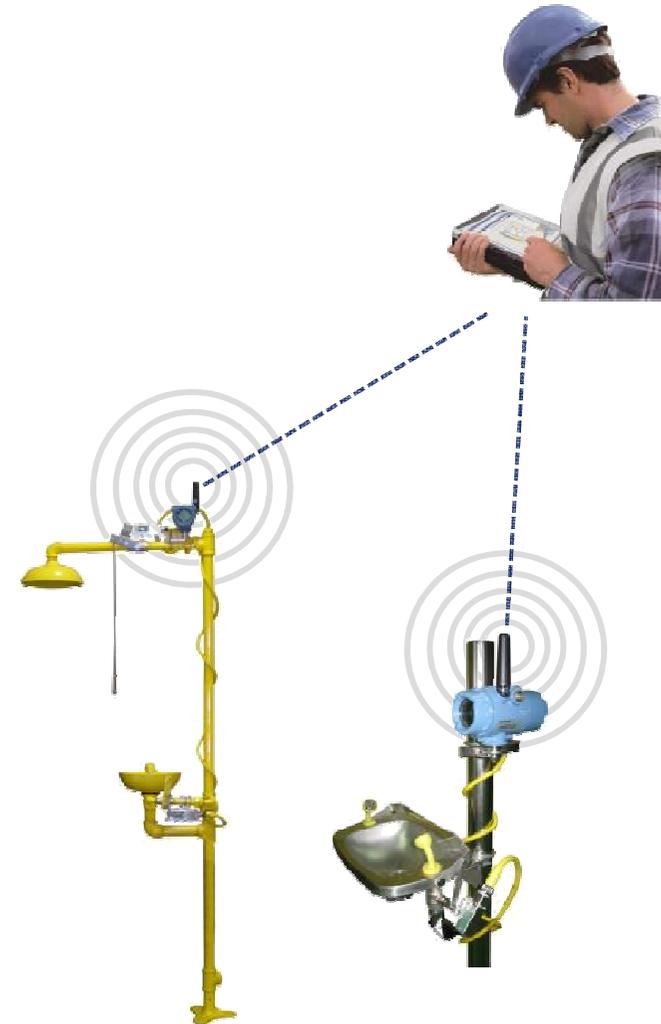
## Customer Challenge

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

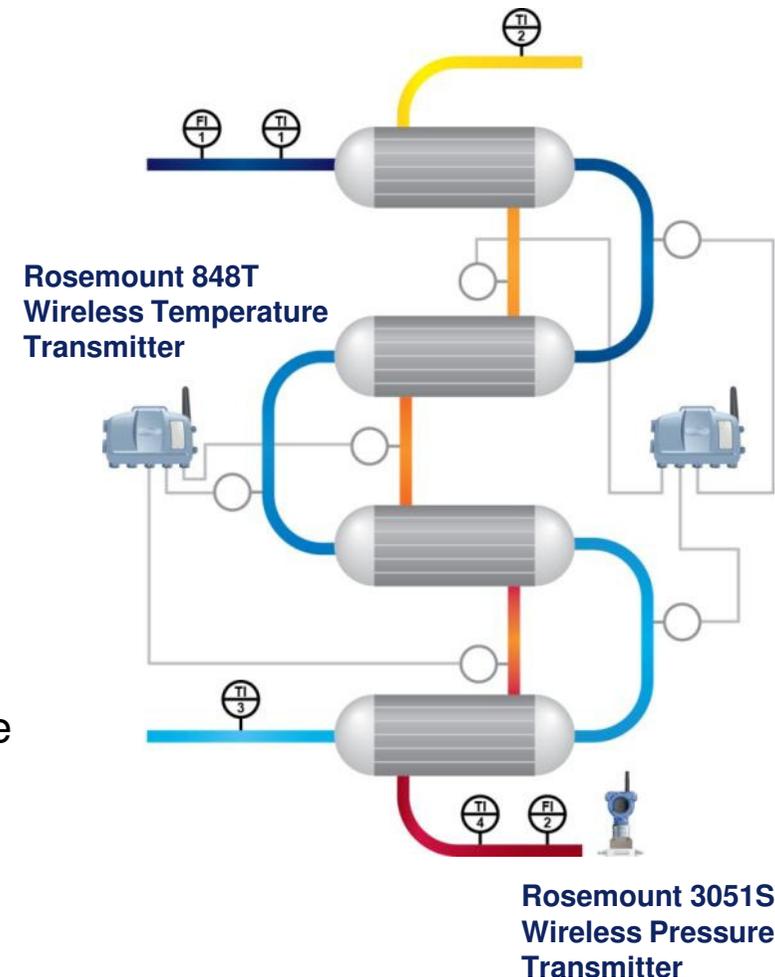
- Heat exchangers are designed to transfer heat from one medium to another
- Widely used in all process industries to heat and cool process fluids

## 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

Trap ID	Trap Name	Trap Type	Trap Status	Trap Location	Trap Size	Trap Pressure	Trap Temp	Trap Vibration	Trap Sound	Trap Health	Trap Alarm	Trap Action
001	TRAP-001	TRAP	Normal	Area 1	2"	100	150	0.5	40	Green	None	None
002	TRAP-002	TRAP	Stuck Closed	Area 2	1.5"	120	160	1.0	50	Yellow	High	Alert
003	TRAP-003	TRAP	Stuck Open	Area 3	2"	110	155	1.5	60	Red	High	Alert



# ***What Does That Mean For Us***

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- 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