ISA100 WIRELESS COMPLIANCE INSTITUTE™

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ISA100 WCI Webinar

Webinar date: 10 April 2019.
The presentation will begin at 13:04 Berlin Time (UTC+2)

IIOT- Steam Trap Monitoring Digitalization using ISA100 Wireless

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Presenters:

Armstrong
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Honeywell
THE POWER OF CONNECTED
Diederik Mols
Diederik.mols@Honeywell.com

About the speaker

Justin Grubka

Global Product Manager- Smart Products
Armstrong International

Justin Grubka is the Global Product Manager for Armstrong International's Smart Products Group. Previous to his current role, Justin was a solution specialist for Armstrong's wireless products and was responsible for assisting North American customers implement, install and utilize wireless monitoring to improve their overall steam system efficiency. Currently, Justin focuses on global sales strategies and implementations in growing markets around the world. Justin graduated from Western Michigan University with a degree in Supply Chain Management and earned his MBA from Spring Arbor University. He resides in Portage, Michigan with his wife, Ashley, and 6 -year-old Step Daughter, Jayden.

About the speaker

"Today Industrial Wireless is increasingly deployed as an integral part of the Integrated Control and Safety Systems (ICSS)"

Diederik Mols

Chairman of the Board
ISA100 Wireless
Compliance Institute

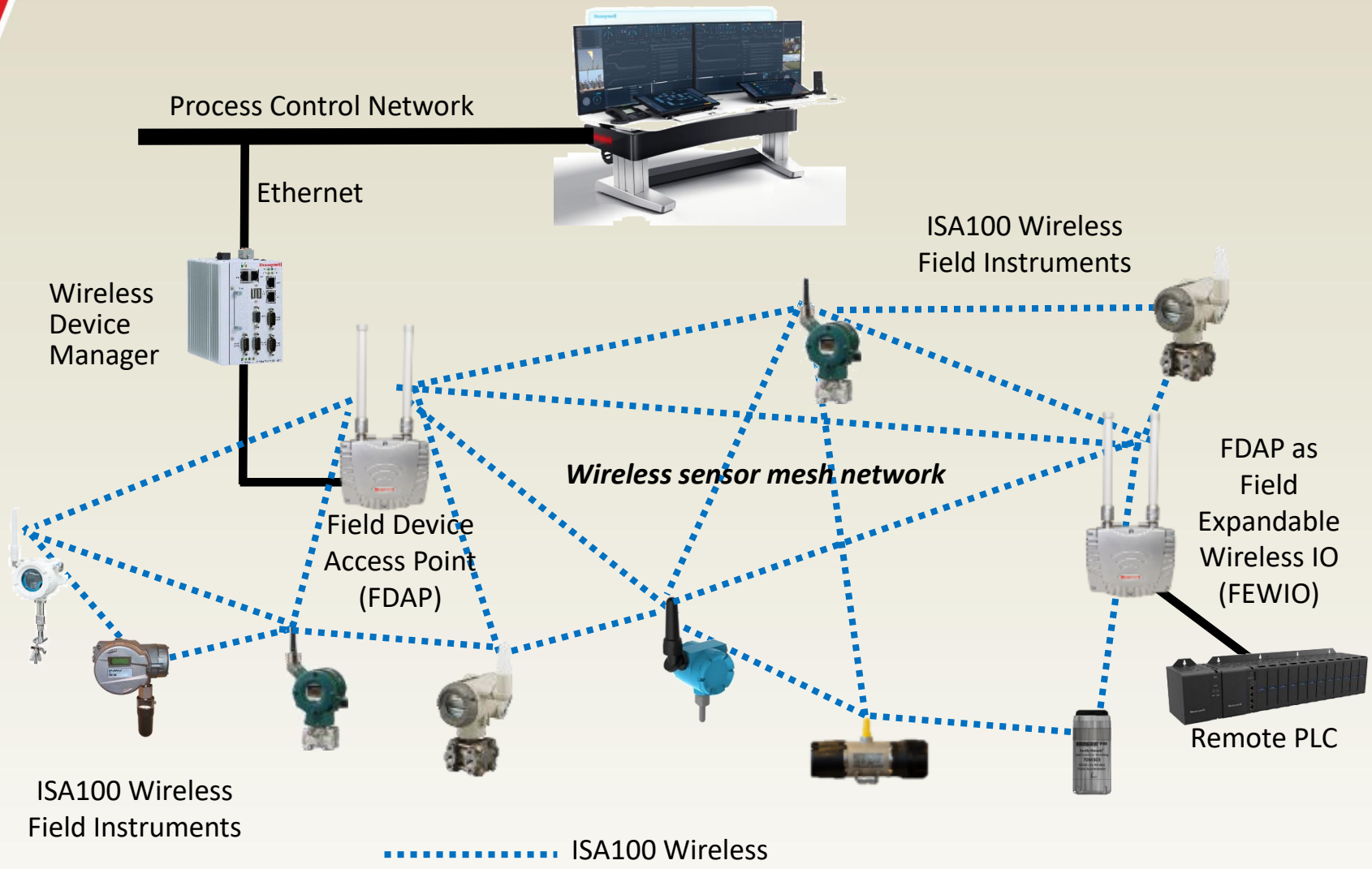
Business Manager
Industrial Wireless
Honeywell Process Solutions

Diederik Mols is Chairman of the Governance Board at the ISA100 Wireless Compliance Institute since October 2017. Prior to that he served two years as Vice-Chairman. Diederik also is an active team member of the WCI EMEA Marketing Team.
Diederik got involved with Industrial Wireless back in 2009 in a business development role for the EMEA region. Currently Diederik is leading the Industrial Wireless business development efforts at Honeywell Process Solutions in a Global capacity.
Diederik started his career as an officer in the Dutch Navy and over the years he gained solid business skills with a number of multi-national organizations in various roles across Engineering, Sales, Marketing and General Management. Diederik holds Degrees from the Royal Dutch Naval Academy and the Delft University of Technology, the Netherlands.

Agenda

1. About the speaker
2. Introduction Industrial Wireless
3. ISA100 Wireless Industry Standard
4. Armstrong ST6700 ISA100 Wireless Steam Trap Monitoring
   - Key Facts
   - Why Monitor Steam Traps
   - Application Examples and User Benefits
5. Summary
6. Q&A

Introduction to industrial Wireless



Applications examples

- Machine health monitoring
- Basic process control
- Monitoring of well heads
- Remote process monitoring
- Leak detection monitoring
- Diagnosis of field devices
- Condition monitoring of equipment
- Environmental monitoring
- Tank level monitoring
- Gas detection
- Fuel tank gauging
- Steam trap monitoring
- Open loop control
- Stranded data capture
- And more

ISA100 Wireless Fast Facts

- International standard IEC 62734 since 2014
- Complies with ETSI EN 300 320 v1.8.1 (LBT)
- End-User Driven Standard - meeting all current and future industrial needs
- Sensor routing or field routers for best performance – Freedom of choice
- Broad Multi-Vendor Portfolio of ISA100 Wireless Devices
- ISA100 Wireless enables SIL-2 Certification
- Ensured Interoperability - best-in-class solutions from best-in-class suppliers
- Readily available ISA100 Wireless Modules and Stacks
- Enable fast-track development and go to market

Benefits of ISA100 Wireless Instrumentation

Cost Savings	• Up to 90% of installed cos of conventional measurement technology can be for cable conduit and related construction • Typically: 1/2 the costs, 1/5 of the time • New and scaled applications are now economically feasible
Improved Reliability	• Wired sensors may be prone to failure in difficult environment • Wireless can add redundancy to a wired solution
Improved Visibility	• Condition monitoring of secondary and remote equipment • Process monitoring, fast additional data for trouble shooting
Improved Control	• Add wireless to existing processes for more optimal control
Improved Safety	• Safety related alarms - end to end SIL2 certifiable

ISA100 Wireless Product Portfolio

Infrastructure

Independent Gateway


- Honeywell, Yokogawa

Access Point (AP)


- Honeywell, Yokogawa

Integrated Gateway/AP

- Honeywell, Yokogawa, CDS, Nexcom

GW/AP + Recorder

- Yokogawa

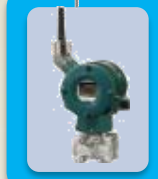
Adapter (HART, etc.)


- Honeywell, Yokogawa

Measurement & Control

Temperature

- Honeywell, Yokogawa

Pressure / Flow

- Honeywell, Yokogawa

Level

- Honeywell, Yokogawa

DI/DO, AI


- Honeywell, Yokogawa

Valve Position


- Eltav, Flowserve, Honeywell

HSE + Life cycle

Corrosion


- RCS , Honeywell

Steam Trap


Armstrong, TLV, Bitherm, Spirax Sarco

Vibration

- BHGE's Bently Nevada

Gas

- GasSecure, Scott Safety, New Cosmos, Riken Keiki

pH

- Honeywell, Yokogawa

Online resources

www.isa100wci.org

- Learning Center with White Papers
- Articles, End-user stories, Forum
- Receiving over 20,000 web views per month
- Full list of certified/registered ISA100 Wireless devices
- And more useful content for you and your business

ISA100 Wireless Interest Group

- Latest news, end-user and expert discussions, insights
- 700+ members and growing; please join and invite your peers to join as well !
- Receiving over 5,000 web views per month

Mind the promotional price draw!

Scan Me!

Scan the QR code or go to **tinyurl.com/isa100-ipad** to join the ISA100 Wireless Compliance Institute mailing list **and** follow us on LinkedIn to enter the drawing! Good odds!

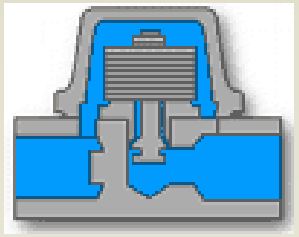
What MUST a Steam Trap do?

A Steam Trap must remove condensate, air, and non-condensable gases out of the system as quickly as it collects to obtain greatest energy gain.

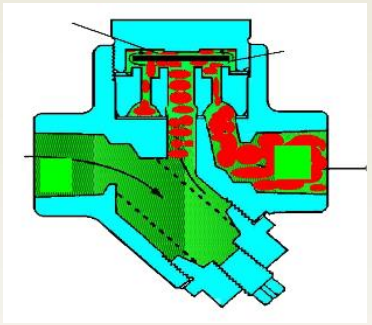
A Steam Trap Must Also:

- Minimize steam loss
- Corrosion resistance
- Withstand water hammer
- Freedom from dirt problems
- Long life and dependable service
- Air & CO_2 Venting
- Operation against backpressure

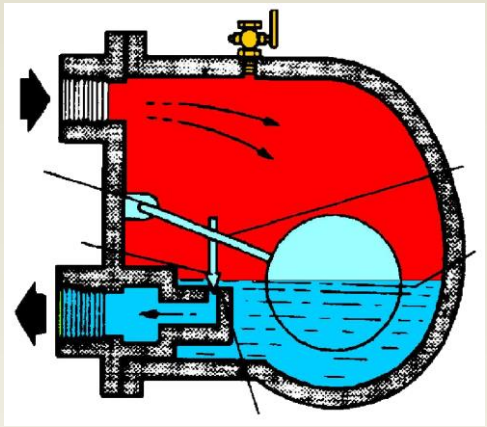
Trap Types



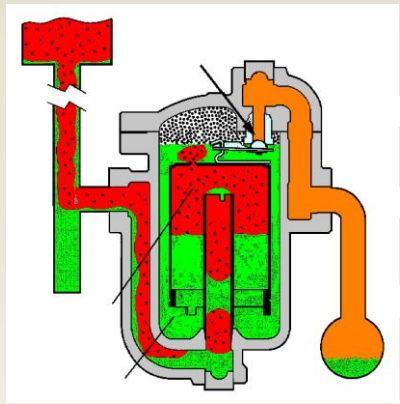
Bi-Metal



Disc Trap



Float
&
Thermostatic



Inverted
Bucket

Result of Steam Trap Failed Open/Closed

Steam Trap Importance

	Steam Loss Thru an Orifice Drip & Tracer Application		
	150psig	250psig	400psig
Orifice	[$/Year]	[$/day]	[$/Year]
#38	398,215	640,210	1,002,655
7/64"	462,455	743,140	1,164,350
1/8"	604,075	970,900	1,520,955
5/32"	213,890	1,516,940	2,376,515
11/64"	1,142,085	1,835,585	2,875,470
3/16"	1,359,260	2,184,160	3,422,240
7/32"	1,849,820	2,972,925	4,657,765
1/4"	2,416,300	3,883,235	6,083,820
5/16"	3,775,195	6,067,395	9,505,695
3/8"	5,436,310	8,737,005	13,688,230
1/2"	9,664,835	15,532,940	24,334,915
9/16"	12,231,880	19,658,535	30,798,700
11/16"	18,272,265	29,366,805	46,008,250
3/4"	21,745,605	34,948,750	54,753,285

	$ Loss Thru an Orifice Drip & Tracer Application		
	150psig	250psig	400psig
Orifice	[$/Year]	[$/Year]	[$/Year]
#38	$3,982.15	$6,402.10	$10,026.55
7/64"	$4,624.55	$7,431.40	$11,643.50
1/8"	$6,040.75	$9,709.00	$15,209.55
5/32"	$2,138.90	$15,169.40	$23,765.15
11/64"	$11,420.85	$18,355.85	$28,754.70
3/16"	$13,592.60	$21,841.60	$34,222.40
7/32"	$18,498.20	$29,729.25	$46,577.65
1/4"	$24,163.00	$38,832.35	$60,838.20
5/16"	$37,751.95	$60,673.95	$95,056.95
3/8"	$54,363.10	$87,370.05	$136,882.30
1/2"	$96,648.35	$155,329.40	$243,349.15
9/16"	$122,318.80	$196,585.35	$307,987.00
11/16"	$182,722.65	$293,668.05	$460,082.50
3/4"	$217,456.05	$349,487.50	$547,532.85

*$10 per 1,000#

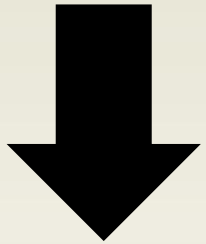
Steam Traps in Industry 4.0

Manually Survey Steam Traps

- Point in time event
  - Typically Annual Survey
  - Potential Safety Risk
  - Unknown Losses
- Slow and Time Consuming
  - Manual Data Entry
  - Surveyor visits each trap
- Requires Experience Technician
  - Acoustic
  - Temperature
  - Various inputs

Steam Trap Monitoring

- Identifying condition of critical steam traps that are difficult to access
- Condensate backing up into turbine caused by plugged steam trap
- Significant energy loss due to failed steam trap on high pressure steam lines
- Reboiler not draining properly due to plugged steam trap



- A safe and reliable methodology for testing inaccessible steam traps for immediate failure notification
- Significant cost avoidance from potential turbine blade damage
- Significant energy savings due to reduced consumption
- Immediate identification of root cause problem to reduce potential production loss

Sensing Technology

Temperature

- Utilized as a reference for failed closed

Acoustic

- Tuned to steam trap specific frequency for passing steam

Universal

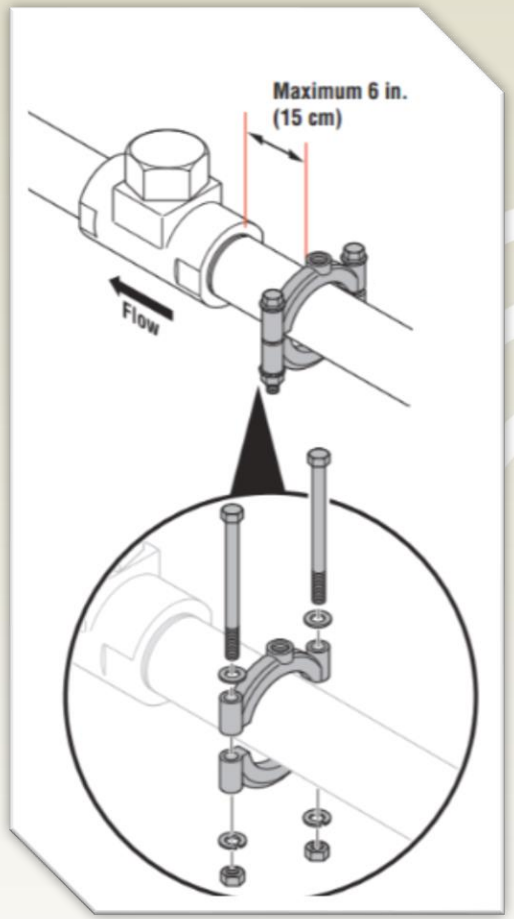
- Any Trap Model/Manufacturer
- Any Pressure (>15psig)
- Any Application
- No Extra Programing

Battery Powered

- Reduces Cost of Wiring
- 5 - 7 Year Battery Life

Installation

- **Non-intrusive**
  - No process downtime
- **Gather proper frequency**
  - Filters outside Noise
  - Amplifies trap frequency
- **Reliable mounting**
  - Vibration resistant



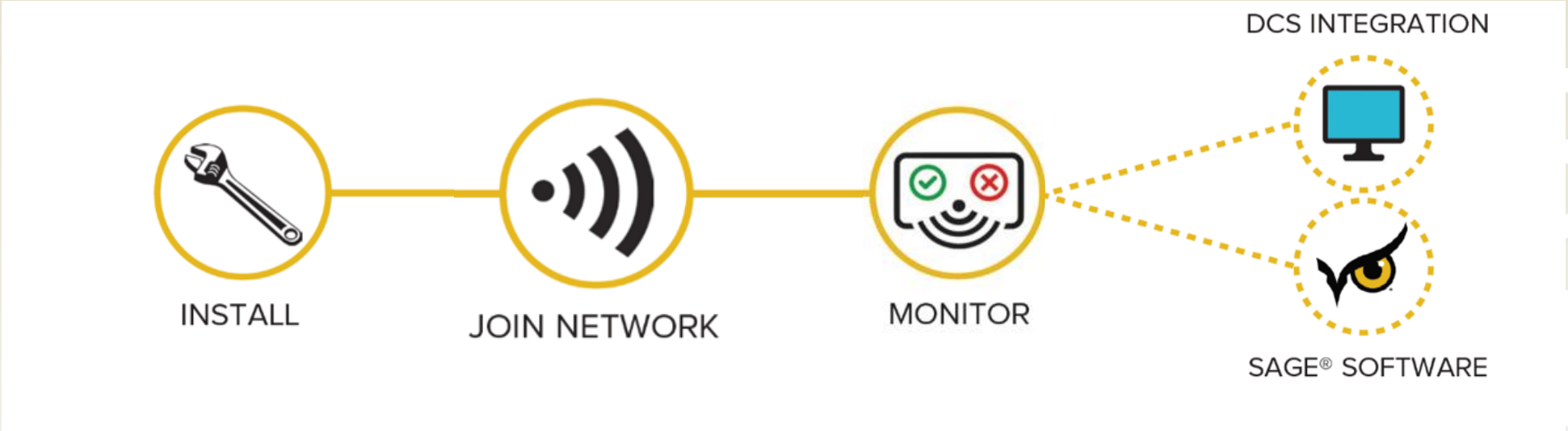
Join Network

- **Two Options**
  - Over the Air Provisioning (OTA)
  - Infrared Provisioning
- **Firmware Updates**
  - Over The Air Updates

Monitoring

Value sent to gateway	Condition	Status	Comment
1	OK		Steam trap is in good working condition
2	COLD		No steam; steam trap is plugged, failed closed, or undersized
3	BLOW-THRU		Steam trap is blowing-thru

Simple – Smart – Sustainable



Intelligent Decisions Result In

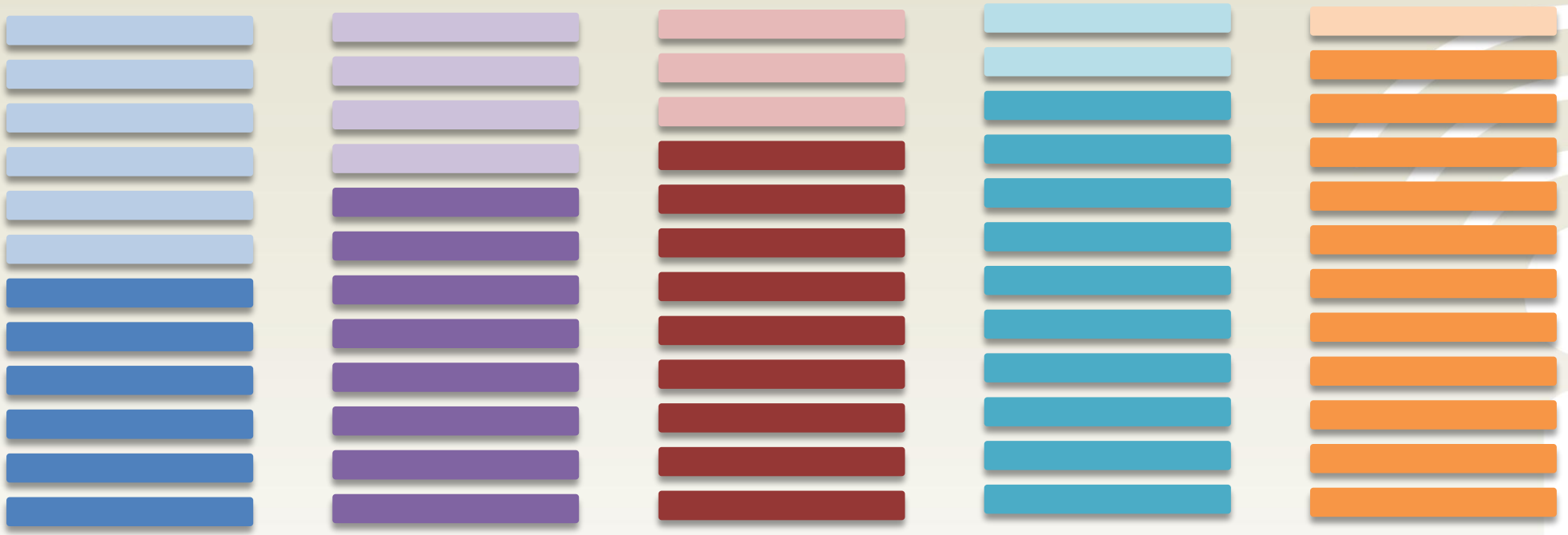
Reduced Unplanned Downtime

Maximized Profitability

Increased Production

Greater Product Yield

Lower Operating Costs/ Increased Profit



KEY APPLICATIONS

High Pressure Steam Turbines

- Why
  - Eliminate
    - Flooding turbine
    - Extensive blade damage
    - Energy loss from high pressure distribution
- Result
  - Decreased maintenance
  - Increased efficiency

Critical Steam Tracing

- What
  - Sulfur
  - Polymers
  - Viscous Fluids
  - Other Tracing (controlled temperature is critical)
- Why
  - Prevent unit shut down
  - Avoid piping removal/steam out
  - Eliminate fluid solidification

Process Applications

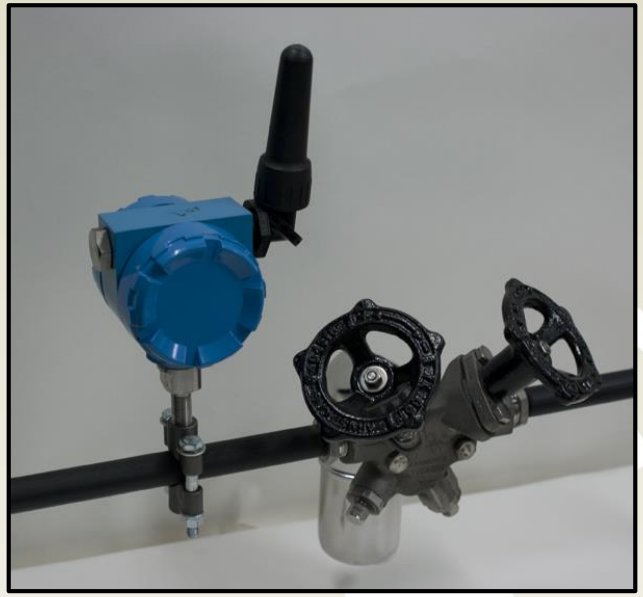
- What
  - Re-Boilers
  - Shell & Tube Heat Exchangers
  - Steam Heated equipment
- Why
  - Prevent unit shut down
  - Avoid process disruptions
  - Increase process efficiency

Energy

- What
  - Medium Pressure Steam Traps
  - High Pressure Steam Traps
  - Hard to access steam traps
- Why
  - Reduce cumulative monetary losses
  - Eliminate energy waste
  - Decrease Co2 Emissions

Turbine Application

- Project Overview
  - Monitored 50 High pressure steam turbines
- Objective
  - Notify of potential turbine issue prior to failure
  - Maintain turbine efficiency
- Results
  - Detected 2 failed closed steam traps
  - Applied corrective actions to avoid blade damage
  - Decreased turbine maintenance (2 reliability issues)
  - Avoided potential process shutdown/extensive outage



Questions?

www.isa100wci.org

ISA100 Wireless Interest Group

690+ members and growing; please join and invite your peers to join as well !

Justin Grubka

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THANK
YOU