WirelessHART Applications: Value and Path to IIoT

Philippe Moock, Armstrong International
Business Development Manager
What to Expect from a Wireless Solution

- **Make it Simple**
  - As simple as 4-20mA
  - Technology not technicians

- **Make it Reliable**
  - Process plants change
  - Need to coexist

- **Make it Secure**
  - Secure the data and network
  - Authenticate data and devices

**HART Without Wires!**
WirelessHART Mesh Network

- Self-building mesh
  - Simplifies commissioning
  - Automatic features
    - Scheduling
    - Communication links

- Self-healing network
  - Redundant communication paths
  - More instruments = more redundant pathways
Interoperability
**Devices and Adapters - WirelessHART**

**WirelessHART Adapters**

- Adds wireless connectivity to a 4-20MA device
- 1 adapter to a device or multiple devices using multi-drop
- Connect on or near a device or anywhere on the 4-20mA loop
- Battery or line power options
Make it Secure – Always On Security

WirelessHART ensures secure communications

- Security is “built-in” and cannot be disabled
- Uses standard AES-128 bit encryption
- Ease of use (automatic functions)
- Only the final device can decrypt and utilize the data
Make it Secure - Risk Assessment / Reduction

*WirelessHART* networks have two main categories of protection:

- **Data Protection**
  - Confidentiality
  - Integrity
- **Network Protection**
  - Availability
WirelessHART Applications
Steam Trap Failure

If the steam trap **fails open** (Leaking or Blow-Thru):

- Increased back pressure.
- Steam losses (monetary losses).
- Safety issue.
- Environmental issue...

If the steam trap **fails closed** (Cold):

- Wet steam.
- “Stalling” or flooded heat exchanger.
Manual Steam Trap Survey

- Testing by specialized technician
  - Visual method
  - Temperature method
  - Sound method

Sporadic - Time Consuming - Safety Risk

Unplanned Downtime
Wireless Steam Trap Monitoring

Non-intrusive waveguide that filters outside noise and amplifies trap frequency. Suitable for any trap model/manufacturer, any pressure, any application.

<table>
<thead>
<tr>
<th>PV</th>
<th>Condition</th>
<th>Status</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OK</td>
<td>OK</td>
<td>Steam trap is in good working condition</td>
</tr>
<tr>
<td>2</td>
<td>COLD</td>
<td></td>
<td>No steam; steam trap is plugged, failed closed, or undersized</td>
</tr>
<tr>
<td>3</td>
<td>BLOW-THRU</td>
<td></td>
<td>Steam trap is blowing-thru</td>
</tr>
</tbody>
</table>
Intelligent Monitoring Solutions

- 24/7 monitoring vs. point of time
- Quickly identify a failure (what, when, and where)
- Avoid unplanned downtime
- Cut labor cost
- Free up maintenance resources
- Increase efficiency
- Reduce energy consumption
- Short payback due to high cost of steam
- More devices on the steam system will strengthen the existing WirelessHART network
Increase Heat Exchanger Efficiency

Heat Exchanger Efficiency

Increase efficiency of heat exchangers and surface condensers with real time continuous monitoring.

SOLUTION

Automation & Wireless Infrastructure

Better manage condenser cooling to maximize steam turbine output.

Prevent outages by providing operations and maintenance workers with advanced information about developing problems.

Business Result

Minimize energy loss and cost from fouling.
**Pump Monitoring**

**Pump Health Detection**
Real-time, continuous monitoring of cavitation, seal pot level, and flow

**SOLUTION**

- **Wireless Pump Monitoring**
  - Informs users feed water pump performance and prevent pump damage from overheating in low-load conditions

**Business Results**
- Avoid unplanned outages
- Operate at maximum efficiency
- Increase reliability
Guided Wave Radar Optimization
HART data provides additional information

Echo Curve | False Target Rejection Profile | Volume | Threshold Wizard

Echo Curve

- Vapor
- Liquid
Rotating Equipment
Mobile/Portable

BOILER EFFICIENCY

RAIL CAR

BATCH PROCESSING

TRUCKING

PORTABLE MEASUREMENTS
Safety

PORTABLE GAS MONITORING

SAFETY SHOWER

GAS MONITORING
Thank you, Sponsors