Implementing Wireless around the Plant

Phillip Ng - Honeywell
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- Phil is a Senior, Global Product Manager in Honeywell’s OneWireless Marketing organization.
- His primary focus is to serve as a liaison to the various standards organization such as ISA and the ISA100 Wireless Compliance Institute (WCI).
- Phil has been with Honeywell over 25 years and his past product responsibilities included the first real-time, online corrosion transmitter (SmartCET), APP Node, Control Builder, and Point Builder. Phil is also a certified Six Sigma Black Belt.
Overview of Topics

• Wireless Goals

• Using Wireless to Solve “Traditional” Issues
• Expanded Use of Wireless Today
• Using Wireless in the Near-Future
• Closing Summary

Select the wireless system that can accommodate the future
Wireless Goals

• Support existing plant control and applications needs
• Provide a wireless solution with the ability to gain benefits from new applications
  – Like mobile workforce, remote monitoring, etc
• Provide a platform to enable future technologies and support new applications.
  – Applications that haven’t yet been conceived.

Wireless solutions transforms plant operations
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Case Study 1
Using Wireless to Solve “Traditional” Issues

The focus is to use wireless to solve a monitoring or control problem – a traditional problem.

Customer Need

• A US based refinery selected wireless to monitor pressures in the refinery’s flare header piping
  – They needed to determine which unit caused increase gas rate on the FGRU (flare gas recovery unit).
  – Instrumentation was lacking and adding more wired instruments was cost prohibitive
  – Continue to waste plant resources to chase down the problem.

OneWireless is based upon ISA100.11a
Case Study 1
Using Wireless to Solve “Traditional” Issues

• Decision criteria for selecting OneWireless
  – Network speed
    – High speed Ethernet backbone (100 ms) has almost no latency
    – Transmitter features one (1) second measurement rates
  – Network expandability
  – Cost of transmitters and batteries
  – Integration of Wi-Fi in the Multinodes allow for the same infrastructure to be used for two different wireless networks
    – ISA100.11a radio
    – Wi-Fi radio

Accurate, reliable plantwide monitoring was the goal
Case Study 1
Using Wireless to Solve “Traditional” Issues

**Results**

- Customer wanted to set up an infrastructure to go beyond this initial project
  - Project Team took additional step to communicate with other plant engineers to understand additional wireless opportunities
  - Wireless transmitters and Wi-Fi devices connect to the control system
  - Project Team calculated break even point between a wired solution and wireless.
    - 50% reduction in cost for this project
- New data helped to reduce troubleshooting time by 50%
- Additional transmitters take less than day to get online
Solution Update

- Alternative solution is to use Cisco’s 1552S Access Point to provide a Wi-Fi and ISA100 connection

Features
- IEEE 802.11a/b/g/n radios for Wi-Fi and Mesh
- Wireless coverage up to 1300 ft for ISA100.11a field devices thanks to integrated IPV6 based ISA100.11a Backbone Router with diversity antenna
- Process data preconfigured with highest priority
Using Wireless to Solve “Traditional” Issues

Another traditional problem

Customer Need and Solution

• Access to stranded HART diagnostic data from wired HART transmitters.
• Use a wireless adapter to attach to your HART transmitter
  – Unlock stranded diagnostics from HART devices
  – Convert wired HART devices to ISA100 network
  – Option use as routing device
  – Powered from 4-20mA loop and D-cell battery
  – Send HART data over the ISA100.11a network

Real life use of ISA100’s ability to support other protocols
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Case Study 2
Expanded Use of Wireless Today

**Customer Need**

- PetroChina at their Xigu Oil Tank Farm wanted to implement a more modern, intelligent control system
  - Add 20 pressure measurements along the oil transportation pipeline almost 3km away from the control room
  - Monitor tank root valve and integrate data into the Oil Movement System
  - Existing cable trays and conduit were full

Non-efficient and low accuracy walkie talkies were being used
Case Study 2
Multi-Functional Wireless Network in China

SOLUTION

• Complete wireless solution plus integration to mobile access
  • Valve position sensors monitor the on/off status of the root tank manual valves
  • Pressure measurement on pipelines in a remote area of the tank farm
  • **Plus** Data entry at the rail dock via wireless tablet computer for real-time updating of the control system

Eliminate need for paperwork; recurrent cost savings
Case Study 2
Expanded Use of Wireless Today

**Results**

- **Value to PetroChina**
  - No new cables, wiring, and cable tray. No affect from the existing railway.
  - Saved on the total installation cost and commission time.
  - Wireless transmitters provide remote online diagnostic, maintenance, and alarm data.
  - Access to real-time data integrated with the control system and train loading system (no more walkie talkies)
  - Online software upgrading, can help save maintenance costs

PetroChina needed a complete solutions and services provider
Case Study 2
Expanded Use of Wireless Today

Results

• Value to PetroChina
  — Mobile station provides access to key process parameters, historical data, graphics, maintenance information and other important control system data on the railway loading and unloading dock
  — Browse SCADA data through a real-time mode using standard Modbus TCP.
  — Wireless network is capable of future extension to additional wireless applications like wireless field advisor, gas detector, radar level etc.

Users are exploring how wireless can make new positive changes
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- Expanded Use of Wireless Today

## Using Wireless in the Near-Future – It’s Here

- Closing Summary
Case Study 3
Unmanned Control Room in France

Customer Need and Solution

- Mesh network to support mobile applications
- Operators in process plant equipped with PDAs with real-time control room alarms

Solution

- OneWireless™ Network
- PDAs
- Buzzer / flashlight alarming
- Site survey and startup assistance

Benefits

- Operators are informed about active alarms in the control room
- Can perform other tasks while monitoring plant operations

First unmanned onshore control room; true business transformation
Customer Need and Solution

- A single wireless network to support a variety of wireless devices

Application Protocols:
- HART
- OPC
- MODBUS, etc

Host Applications:
- Asset Manager
- Field Device Mgr
- etc

Process Control Network

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Process Control Network

Leading technology – the wireless platform for now and the decades to come
Planning Your Future Wireless Network

Customer Needs

• Wireless device network for process control field devices and the backhaul network will be linked
  – The Cisco 1552S AP is an example
  – How will you manage the networks?
  – What are the underlying features, functions, building blocks (e.g. IP device addressing) that make it easier for you to manage?
Planning Your Future Wireless Network

**Customer Needs**

- What existing applications are you running?
  - They haven’t disappeared today and they most likely won’t in the future.
    - HART, FF, OPC, Modbus?
    - Vibration waveforms, tank gauging, other unique large data files?
    - ISA100.11a’s flexibility supports existing protocols

- Control is not a four letter word
  - Wireless can and will be used for control
    - ISA100.11a supports 1 second measurement rates
    - With good battery life
    - With determinism and latency that works for your tried and true PID control
Future Case Study – Wireless Enables Mobile Operations & Commissioning

Customer Need and Solution

• Mobile Operations
  – Real-time data in the field for faster and more effective decisions
    – Process views, procedures, data
    – Improve response to field data & information

• Checkout and Commissioning
  – Mobile access to project data
    – Drawings, instrument databases, operating procedures, real-time process graphics
  – Reduce equipment & improve schedule

Tablets and smartphones for engineers, operators and plant management
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The Impact of Wireless Technology

1. Wireless can provide immediate benefit
   • Saves project costs (one time cost saving)

2. Wireless also transforms operations
   • Saves costs year in year out (recurrent cost saving)

3. Select a system that is easy to use
   • Easy to use today
   • Easy to use in the future
     • Easy to support your applications and operational changes in the future
     • Easy to manage and integrate other wireless networks

Honeywell is a complete solutions and services provider
Thank You
Questions