Industrial Wireless Application Implementations & Wireless Technologies

Wireless Track Presentation #125
Safe Harbor Statement & Disclosures

Industrial Wireless Applications

Sarah Prinster – Apprion
Bruce Manthey – Apprion
“The future of wireless in process automation could well turn out to be a battle between those who use it ‘incrementally’ – in effect to replace copper in conventional applications – and those who use it imaginatively to reshape the applications themselves.”

Andrew Bond
The Industrial Automation Insider Newsletter
The Promise of Wireless

- Significant Cost Savings By Not Having To Run Wires
  - More measurements for limited budgets
- More Measurement, Lower Cost
  - Greater availability of real time data integration
- Workforce Mobility
  - Connecting human, rolling and remote assets to applications in the field
- New Applications Driving Bottom Line Improvements
  - Plant business optimization
  - Enterprise asset performance management
- New Measurements Addressing Mandated Requirements
  - Personnel and equipment safety
  - Plant security
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RF – One Size Does Not Fit All
Right Solution = Many Types of Wireless

**Application**
- Remote site monitoring
- Increased I/O
- Video surveillance
- Mobile Operator
- Condition Monitoring-temperature
- Condition monitoring-Vibration, pressure, tank level
- Asset tracking
- VoIP/VoWLAN
- Safety and compliance

**Best Wireless**
- WiMAX
- Proprietary
- WiMAX
- WiFi (802.11)
- ISA100; WiHART
- ISA100; WiHART
- Active RFID; UWB
- Ethernet/WiFi
- Multiple
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Best Practices for Wireless Approach

- Corporate Guidance & Standards
  - not prescriptive
  - situations are different
  - upstream / downstream / airports / hotels
- What is your roadmap?
- Budget
Open Wireless Roadmap and Standards

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<th>IT Network Characteristics</th>
<th>Plant Network Characteristics</th>
<th>Control Network Characteristics</th>
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<td>Approximate Time</td>
<td>Application-Time</td>
<td>Real-time</td>
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<td>Response reliability is critical</td>
<td>Application-driven QoS</td>
<td>Response time is critical</td>
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2.4GHz 802.11 channel allocation strategy

Bandwidth Utilization by Radio 802.11n (2.4GHz 20MHz Ch.)
Do a Site Survey

- Cannot do this on Google Maps!
- Do an on-site
  - real walk-about
  - with real measurements
- <5% of total budget
A Better Way – the Wireless Network

Comprehensive Wireless Network

Digital Umbrella

Office Wireless Network

Office IT Network Domain

Plant Industrial IT Network Domain

ISA 100 Wireless Network
Real-Life Examples
Huntsman Port Neches - Mobility

Achieve Manufacturing “Zero, Zero, Zero” Goals

• Implemented a Manufacturing Excellence Program the goal of: zero injuries, zero equipment and product defects, and zero environmental releases
• Reduce the high costs due to equipment downtime and lifecycle run time
• 30% of workforce retiring immediately and taking non-documented knowledge with them
• Implement a wireless solution that would replace a completely manual approach
Wireless Implementation

- Integrated Industrial Platform - IONosphere
- Wireless Infrastructure – Industrial Appliances/IONizers
- Wi-Fi & WiMAX Umbrella
- Network Management Services
- Motorola handhelds
- Mobility software on handhelds
- Motorola TEAM Server
Mobility Implementation

Real-time Data Transfer
Live rounds, incident handling, and critical updates from the mobile field

Data Capture
Historical data capture for reporting and future knowledge transfer

Workforce Mobility
Rounds, checklists, SOCs, field management, consequence of deviation

Facility-wide Data Access
Facility-wide visibility of all monitored devices for immediate event indication
Results to Date

Safety Incidents Continue to Fall to Zero

- 50% reduction of daily pump inspections
- Safety incidents have been reduced by over 75% and are expected to fall to zero.
- Increased effectiveness in defect capture and providing accountability at all levels of the organization
- Reduced maintenance costs.
- Increased uptime from the improvement in overall equipment effectiveness that increases production quality and quantity.
Integrated Applications in Existing Infrastructure

Emergency Notification

Tank Gauge Monitoring
Additional Wireless Benefits

Turnarounds

Rugged Handhelds

TEAM VoWiFi

Industrial Handhelds

Workforce Mobility
Rounds, checklists, SOCs, field management, consequences of deviation

Rugged Handhelds
TEAM VoWiFi
Industrial Handhelds

Facility-Wide Metrics
Continuous, reliable communication & metrics regarding maintenance, process status and critical events
MarSec compliance mandates video for safety and security

- Compliance mandates required video for safety and security
- Wanted to add Communications and Condition Monitoring Applications in the near future
- Budget constraints required implementation at the lowest cost possible
- Needed to immediately and cost-efficiently avoid compliance fines and possible security risks
Carousel Monitoring
Stream video from multiple cameras with up to 16 camera views

Intelligent Search
Search on key visual attributes captured in the video

Real-Time Alerts
Video Event triggered alerts and alarm notifications and status bar

Pan, Tilt & Zoom
Alter camera remotely via PTZ widget in dashboard
RockTenn – Video for Security

Object Recognition
Detect and recognize specific objects, faces and motions

Video Archives
Store and index all past events and activity for easy search and access

Remote Monitoring
Continuous camera rotation and monitoring of critical remote areas

Integrated Video
View Video with other Applications in one central dashboard
RockTenn – Video for Security
“Caught in the Act!”
ION Software and Devices

- IONosphere
- Motorola 5181’s
- Apprion IONizers
- 22 Wired and Wireless PTZ Video Cameras throughout facility
- ION Video Server
- Wi-Fi & WiMAX Umbrella
- ION Managed Services
Compliance + Increased Safety + Security + Cost Savings

- Increased safety and security of plant operations
- Economically addressed security compliance
- Improved process monitoring through remote video
- Cost savings of 25% by not having to lay wires
- A site-wide wireless umbrella that enables the easy addition of future applications
- Apprion's 24/7/365 ION Services provides round-the-clock network support - securely