WCI End User Conference

ISA100 Oil & Gas Use Cases:
- Upstream
- Midstream
- Downstream

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Cost Savings

- Eliminate labor and material costs related to wiring remote, difficult to reach or moving monitoring points
- Simplify creation and maintenance of construction drawings
- More easily accommodate changes including late changes
- Reduced operating costs through elimination of manual reads

- Enables some condition based monitoring application to extend asset life / avoid product loss due to failure
Yokogawa ISA100 – Common Technical Drivers

Technical Drivers

- Lack of communications, and often power, at desired measurement location
- Significant cost / time / weight savings vs. adding wired points
- Elimination/avoidance of tethers/slip rings for moving/rotating equipment
- Limited DCS I/O expandability and desire for “intelligent I/O”

Primarily monitoring

- Beginning to see wireless monitoring with wired control

Source: SBM Offshore
Upstream
Offshore Oil Well Monitoring
Offshore Application – Annulus Pressure Monitoring

- There is **well integrity risk** due to subsidence
- Extreme subsidence experienced could lead to production, **safety** and business being jeopardized.
- Typical practice is to **monitor annulus pressure manually** by reading pressure gauge
- In order to ensure well integrity and **early detection** in case of leakage, migrate to **online monitoring** of annulus pressure
Upstream – Offshore Injection Pressure Monitoring

- **Challenges**
  - Wiring difficulty
  - No power source

- **Solution**
  - Long range, battery powered pressure monitoring

Monitor the pressure of the gas supplied from compressor.

Supply gas from compressor

Valve

Injection

500 ~ 800PSI

1600PSI

Monitor the pressure of the gas supplied from compressor.
Wireless Pressure and Gas Detection

Heavy Steel Obstruction

Multi-deck Obstruction

5km Long Distance

Wireless Press Transmitter

15dbi Antenna

Wireless Gas Detector

Gateway
Midstream
Oil Pipeline Leak Detection
LNG Liquefaction Leak Detection

- Detect leaks at pipeline welds using wireless temperature transmitters
Upstream
Refinery in Salt Lake City - Tank Level/Alarm
Monitoring for Toxic Gas Dispersement

Goal:
- Auxiliary monitoring points at plant perimeter
- Not a safety application

Challenges:
- No power or communications at fence line
- No battery powered toxic gas detector

Solution:
- H₂S monitor
- ISA100 IO adapter with AI
- Battery backed solar to power gas monitoring
Low CAPEX Plant-wide Monitoring of Battery Rooms

Application
- Temperature and A/C operation monitoring emergency shut down battery rooms

Key Features
- Full redundant system
- Four hops, max 1 km communication

Customer benefit
- One week commissioning & engineering
- Reduce Capital Expenditure (Approx. 80% down)
- One system can monitor two km² whole plant

More than 80% Down

Wireless

Wired
Gas Fired Power Plant

Application
- Analysis of gas turbine performance
- (Flow/temp for vent & combustion air system)

Customer benefit
- Digital measurement of key parameters in the DCS
- Achieved monitoring of previously difficult to reach and un-monitored parameters
- Eliminated costly conventional instrumentation
- Eliminated need for operator patrols to obtain key parameters
Questions and Discussion
Co-innovating tomorrow™

Thank You