

Yokogawa ISA100 Application Examples



Event: ISA100 Wireless End User Conference
Location: SKF Houston, TX
Date: March 1, 2016
Presenter: Kevin Zamzow

❖ Yokogawa ISA100 Applications Overview

❖ Common 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”



Rotary Kiln Source DGE

❖ Primarily monitoring

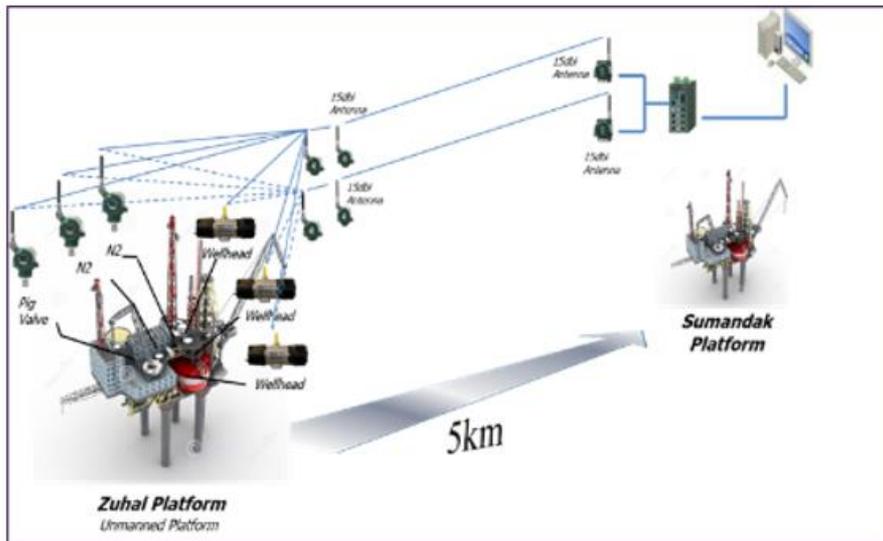
- Beginning to see wireless monitoring with wired control

❖ Petronas – Offshore Platform Safety and Asset Mgmt.

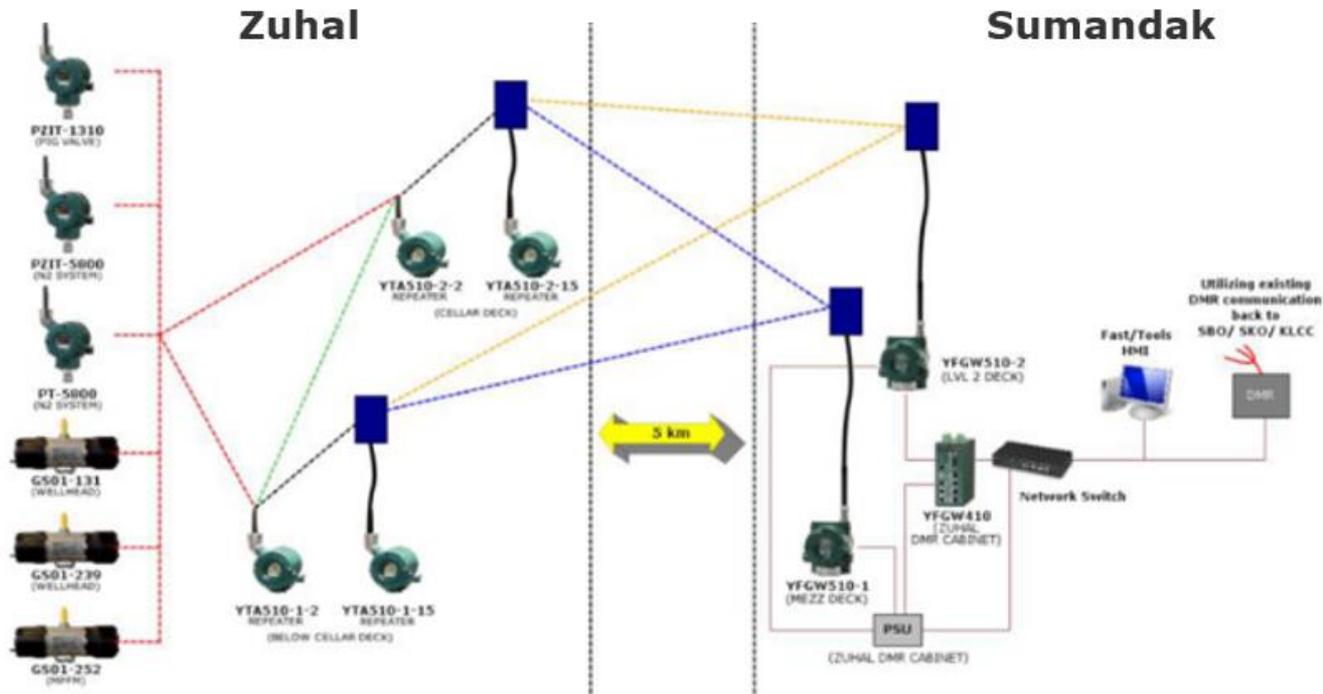
- Zuhal unmanned, platform with minimal facilities located 130km offshore in the South China Sea, Sabah, Malaysia
- Sumandak platform is 5km away from Zuhal

This site was selected for the following reasons;

- On-going fast track project with minimal facilities
- No gas detectors installed on site
- Harsh offshore environment and weather condition
- Possibility to test the communication reliability over 5km distance offshore



❖ Petronas – Offshore Platform Safety and Asset Mgmt.



ISA100 Wireless System Hardware

- ❑ Gateway: 1 pcs
- ❑ Access Point: 2 pcs
- ❑ Wireless Pressure Transmitter: 3 pcs
- ❑ Wireless Gas Detector: 3 pcs
- ❑ Repeater: 4 pcs
- ❑ High Gain Antenna: 4 pcs
- ❑ Antenna Extended Cable: 4 pcs
- ❑ FAST/TOOLS: 1 pcs

❖ Petronas Gas Monitoring - Conclusion

- ❖ The test has proven the capability of improving asset management and improving safety via wireless implementation.
 - ISA100 wireless system remained interoperable and the communication remained robust and stable over the 5km distance in heavy steel multi-deck structure and the harsh offshore environment with monsoon, thunder storm and high tidal differences
 - ISA100 wireless network installation and commissioning time is only 5% to 10% of that required for a conventional wired system – lower project cost
 - ISA100 wireless implementation in offshore platform has proven to be beneficial in terms of safety, operational flexibility and cost saving as demonstrated during the testing period

❖ 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**

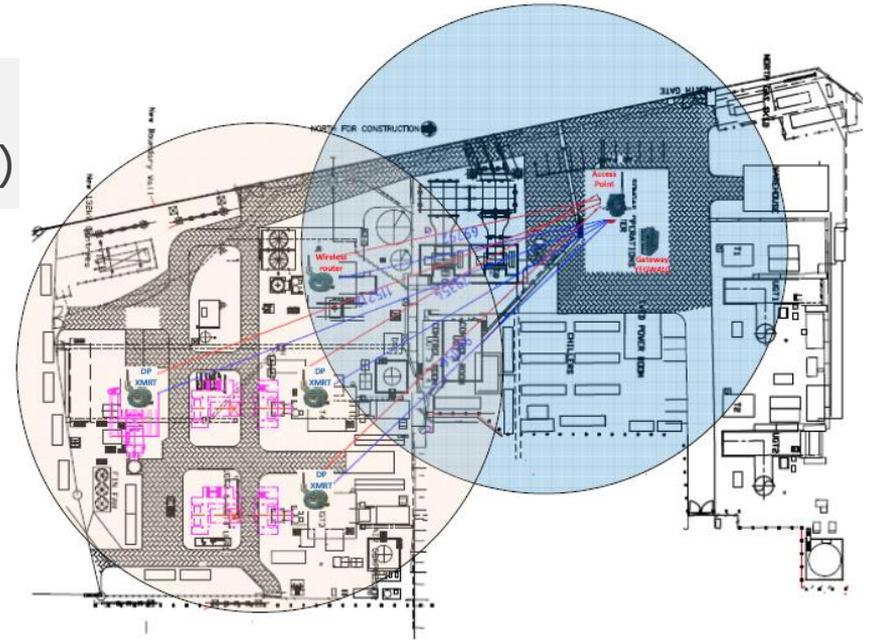
Eliminated Costly Conventional Instrumentation

Eliminated Need for operator patrols to obtain key parameters

Key Features

22+ Wireless Transmitters

Wired Transmitters ADAPTED to wireless technology using ADAPTORS



❖ Low CAPEX Plant-wide Monitoring of Battery Rooms

Application

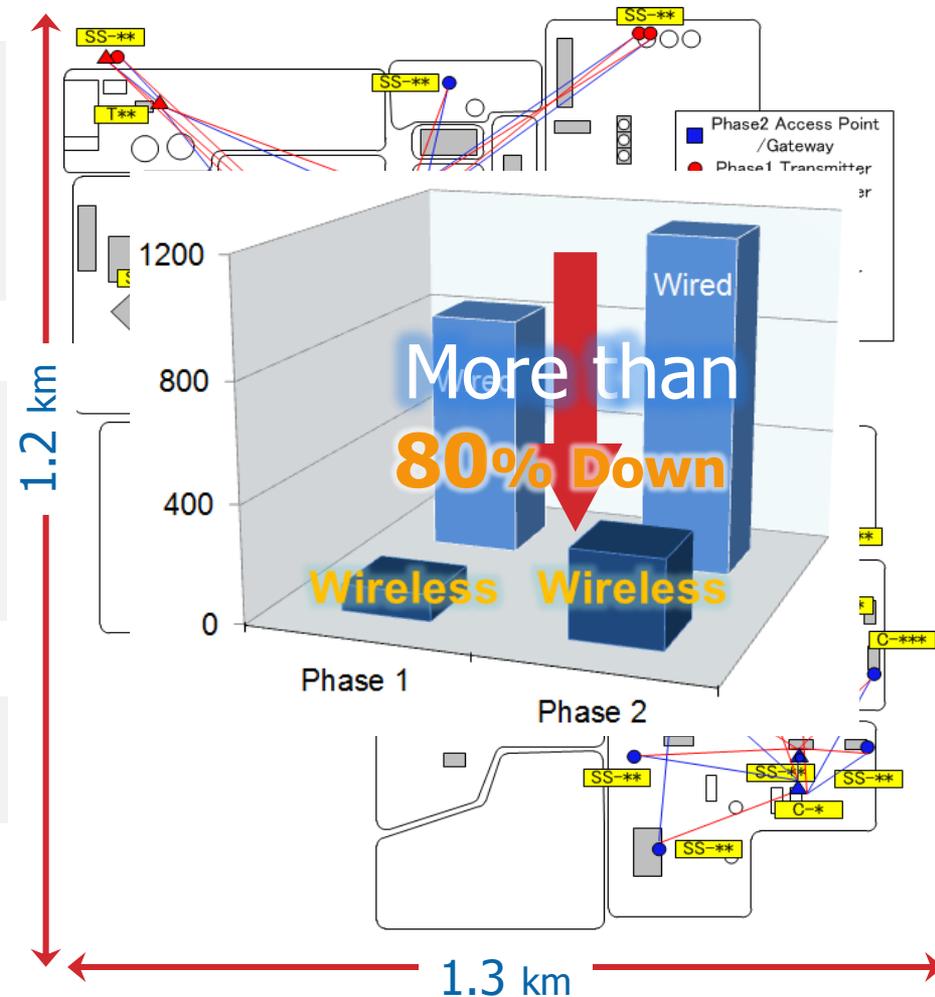
24 Battery Rooms monitoring in Gas Plant
Batteries for Emergency shut down
Temperature and A/C operation monitoring for batteries

Customer benefit

1 week commissioning & engineering
Reduce Capital Expenditure
(Approx. 80% down)
One CCR can monitor **2 km²** whole plant

Key Feature

Full redundant system
4 hops, max 1km communication



Trinmar: Trinidad, Tobago - Offshore Oil Well Monitoring

The screenshot displays a web-based industrial monitoring interface titled "IPRODS - Industrial Portal". The main area shows a process flow diagram with components like "Scrubber", "Vertical Separator #1", and pumps. A central window titled "GP1 WIRELESS GATEWAY DIAGNOSTICS" is open, showing the status of various transmitters and their battery life.

GP1 WIRELESS GATEWAY DIAGNOSTICS

GP1 Gateway Status: ■
 GP1 Backbone Router Status: ■

BATTERY LIFE

Well 770 TSD Transmitter	6616	Days
Well 773 TSD Transmitter	8	Days
Well 774 TSD Transmitter	1856	Days
Well 789 TSD Transmitter	4967	Days
Well 790 TSD Transmitter	8	Days
Well 812 TSD Transmitter	444	Days
Well 844 TSD Transmitter	4782	Days

At the bottom of the interface, there are several buttons: "MAIN MENU", "BACK", "NEW ALARMS", "Upload", "Date: 2/16/2011", "Time: 5:47:00", "Date: 8/27/2011", and "Time: 5:58:19".

Below the screenshot, a legend identifies the components:

- YFGW410
- Backbone Router
- Routing Device
- IO Device
- Device Group
- Comment

❖ 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



❖ Pipeline Leak Detection – North Dakota



❖ Refinery in Salt Lake City - Tank Level/Alarm



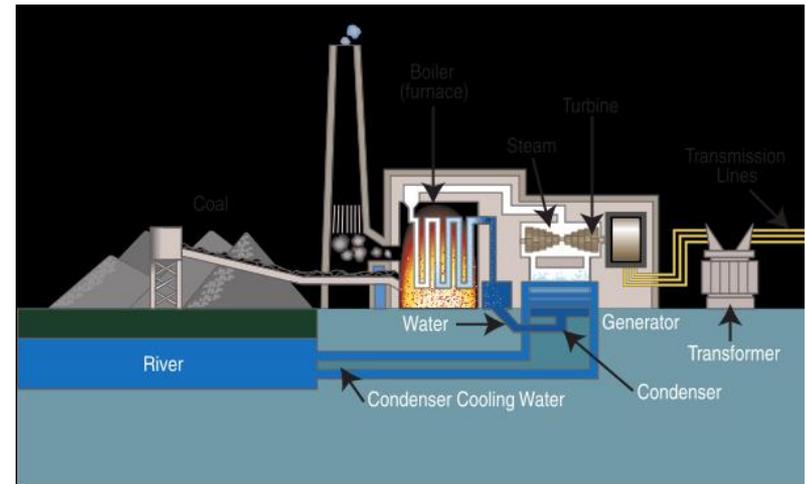
❖ Coal Power Plant Boiler Pressure Monitoring

❖ Challenges:

- Long spans had limited pressure monitoring points for trouble shooting
- High cost to add additional monitoring points

❖ Solution:

- Add additional monitoring points to shorten trouble shooting span
- Use ISA100 pressure transmitters to reduce cost and save installation time



❖ Mobile, Temporary Monitoring of Reactors

- ❖ Use mobile cart for temporary monitoring of multiple temperature points of polycrystalline reactor
- ❖ Cost savings vs. hardwiring all points
- ❖ ISA100 infrastructure covers reactor hall and mobile end device saves on number of transmitters required.

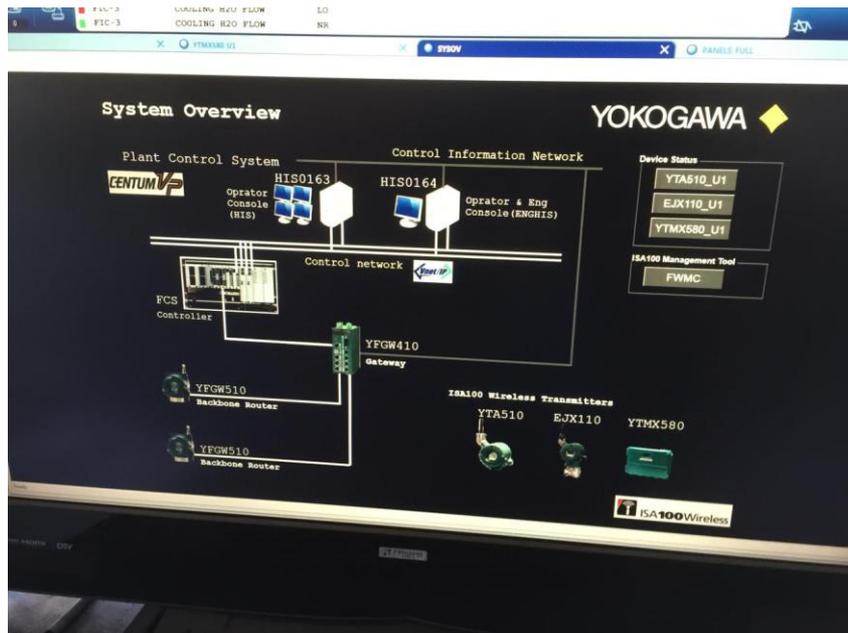


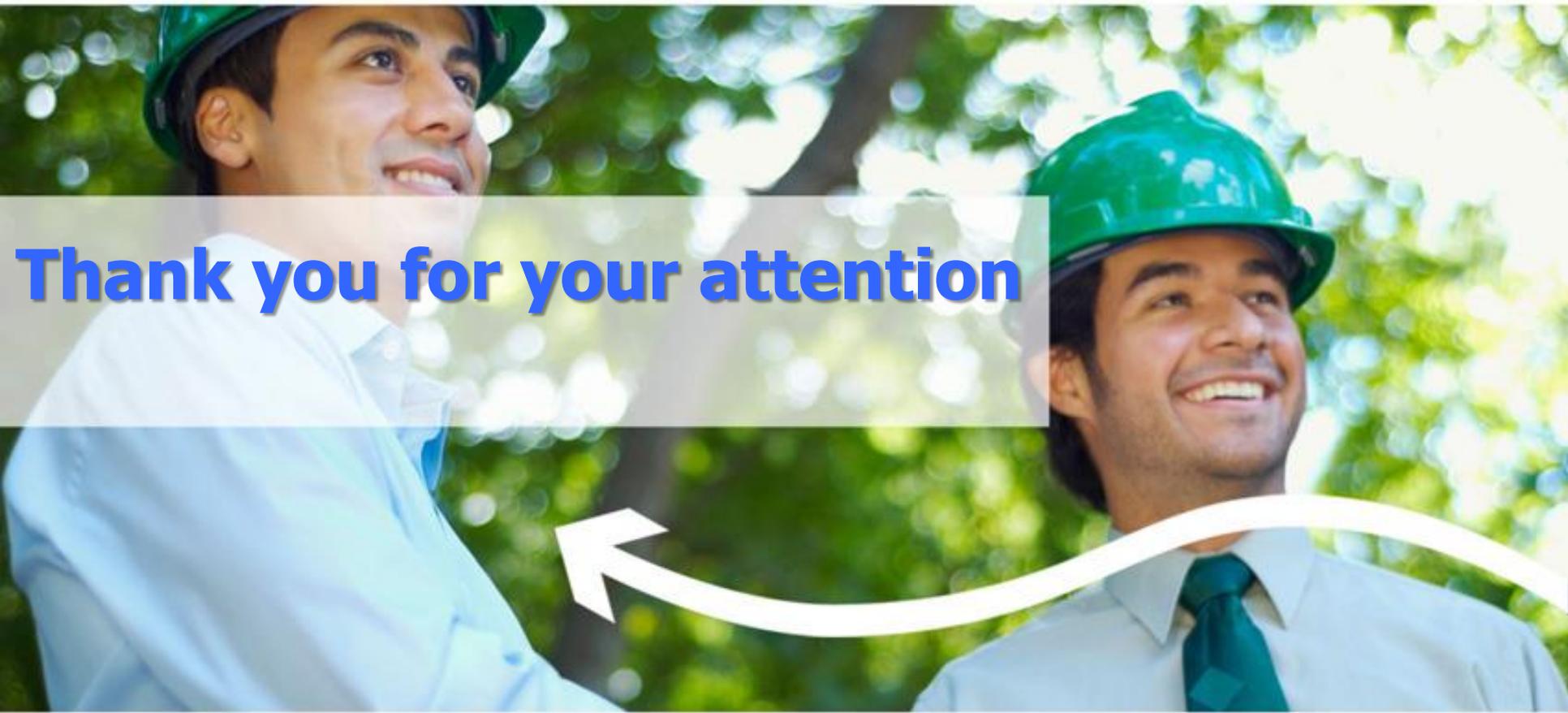
❖ Steel Plant in Ohio: Blast Furnace Temperature Monitoring



❖ Fractionation Research Institute

- ❖ ISA100 network installed
- ❖ Integrated to DCS
- ❖ Members can see ISA100 in operation
- ❖ www.fri.org





Thank you for your attention