



Setting the Standard for Automation™

Honeywell Wireless Applications

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Honeywell Process Solutions

Standards
Certification
Education & Training
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Overview

Starting with our first industrial wireless offering in 2005, Honeywell Process Solutions continues its leading-edge technology tradition with the OneWireless™ and XYR 6000 wireless transmitters which utilize the open ISA100.11a wireless standard.

Honeywell helps industrial customers meet their business objectives by providing services, domain expertise, project management experience, and global engineering and support resources.

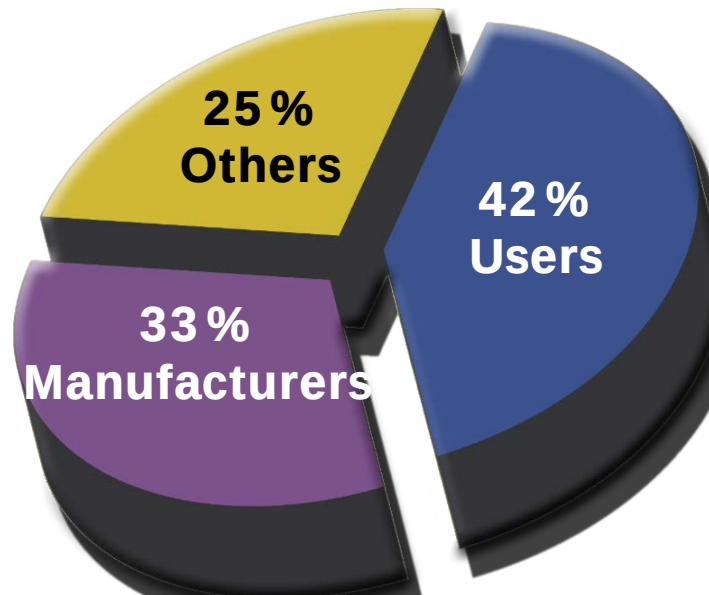
ISA100 Approved As IEC Standard



IEC 62734

FDIS stage successfully concluded on September 5, 2014.
ISA100.11a is an IEC standard.

Our congratulations to all the ISA100 WG3 participants in developing this historic industrial wireless communications standard



Presentation Topics



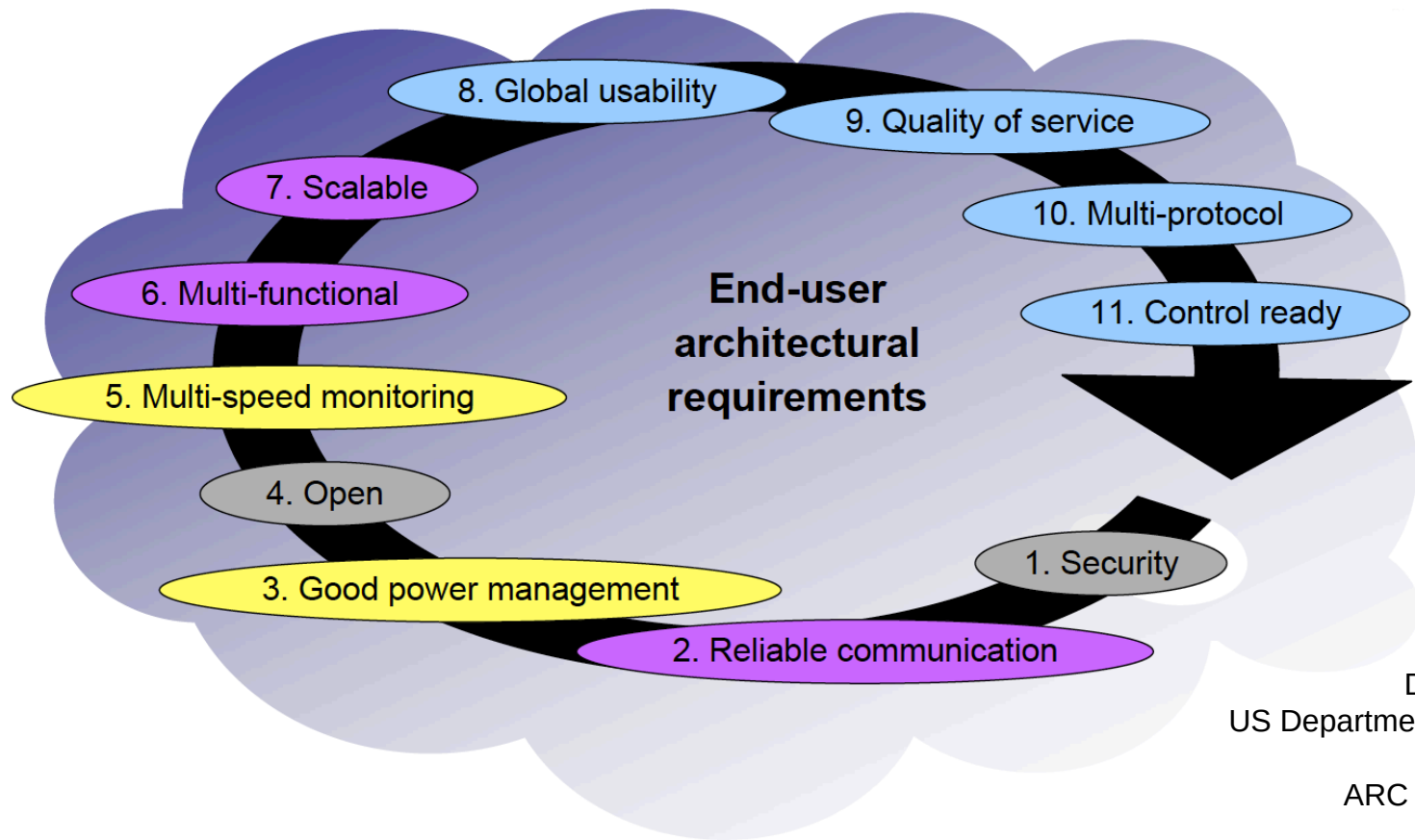
- **ISA100 Wireless User Requirements**
- **Honeywell OneWireless Latency Tested Network**
- **Wireless Tank Level Measurement**

Presentation Topics



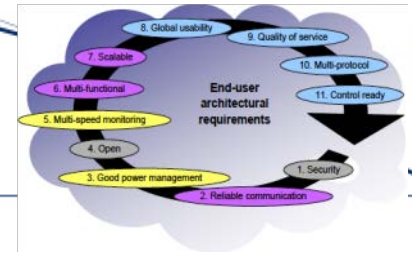
- **ISA100 Wireless User Requirements**
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Core user requirements for wireless sensing



Industrial Wireless Standard shall meet all the requirements

Voice of the Customer



Eleven core requirements for wireless

1	Security	Flawless application of proven cryptography
2	Reliable communication	24x7 operation - High data integrity
3	Good power management	Long and deterministic battery life
4	Open	Select best in class from multiple suppliers
5	Multi-speed	Some devices report frequently, others not
6	Multi-functional	One network, many applications with different needs
7	Scalable	Scalable in numbers, space, and rate
8	Global usability	One technology legal everywhere
9	Quality of Service	Controlled latency, low error rate
10	Multi-protocol	Cleanly integrate with existing investment
11	Control ready	Solves real problems

ISA100 Design Principles



2. Reliable Communications

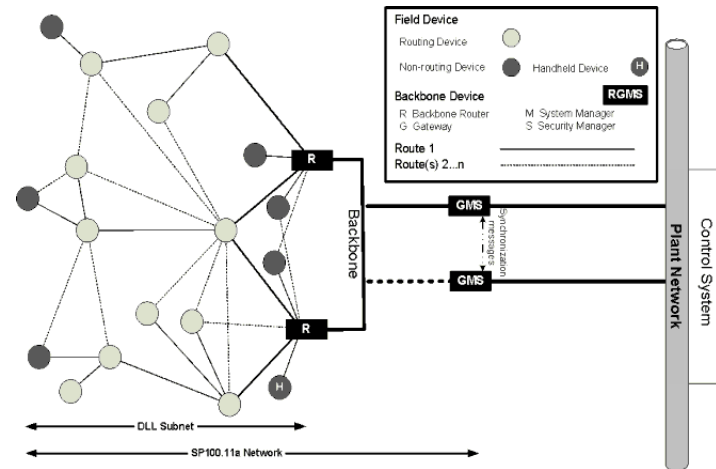
1. Leverage the high, speed IP backbone
2. Ensure authenticity and integrity
3. Deterministic and long battery life
4. Route adaptively
5. Deterministic, scheduled communication
6. Coexist with 802.11
7. Duo cast communications
8. Allow user to choose and evolve mesh architecture

ISA100 Design Principles



6. Multifunctional

- Multiple subnetworks and multispeed allow users to
 - Setup networks to fit their application requirements
 - Deterministic, low latency for control
 - High density device network for monitoring
 - Mesh network to provide alternate communication route
 - Non-mesh to preserve battery life and meet data latency requirements
 - Scalable to thousands of devices
 - Match existing plant functional or physical layout



7. Scalable

- IP addresses allow system to be scalable, just like the internet
- Organizing by subnetworks allow users to
 - Manage one central database but
 - Partition and organize to match their plant layout.
 - Design network for performance
- Mesh and non-mesh configuration choices
 - Low latency and determinism can be a problem for large meshing network and battery life performance

Presentation Topics



- ISA100 Wireless User Requirements
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- Wireless Tank Level Measurement

Premier LNG Producer – Area Warning System



Customer

Premier integrated LNG producer with reputation for being a safe and reliable supplier.

World-class facilities for the extraction, processing, liquefaction and storage of gas.

Oversees and manages all the operations associated with multiple LNG trains and gas production facilities.



Driver

Ensure personnel safety and easy evacuation of the administrative-area buildings should a toxic gas leak occur.

Solution Desired

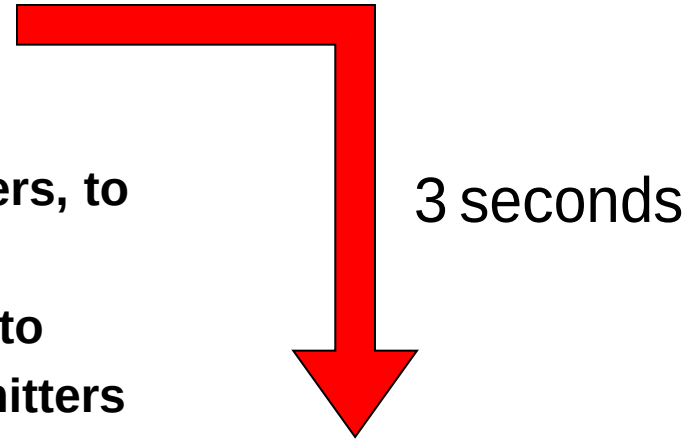
An area warning system with ability to generate audio-visual alarms alerting personnel in the administration area of the plant of any gas leaks.

Three Second Challenge



The system needs to consistently realize an activation time from the

- toxic gas detectors to**
- gas analyzer to**
- the system panel, through several converters, to**
- the RTU acting as MODBUS master to**
- the Wireless Device Manager and then out to**
- the XYR 6000 Universal I/O wireless transmitters**



within an activation time of 3 seconds with the horns and beacons activating simultaneously.

- Acoustic and visual survey to evaluate if the horns and beacons were sufficient to cover the area of interest.
 - Transmitter positions were pre-defined by the customer.
- Honeywell implementation team performed wireless site survey, which provided the crucial information for FDAPs:
 - Location,
 - mounting height,
 - antenna selection

This was critical to achieving the direct links needed to accomplish the one (1) second wireless performance.

- For the design, activation time requirement affected the use of FDAP routers and eliminated the possibility of using field meshing as both added significant time to the activation. The network design would dictate that the majority of the transmitters connect directly to the FDAPs acting as BBRs, as oppose to FDAP routers.

ISA100 Wireless Field Device



Honeywell XYR 6000

Universal I/O wireless transmitter
featuring both DI and DO

Remote antenna



“...requirement for the end to end cycle of the moment of detection of fire and gas until the moment of activation of the sounders and beacons, as well as *with absence of line power.*”

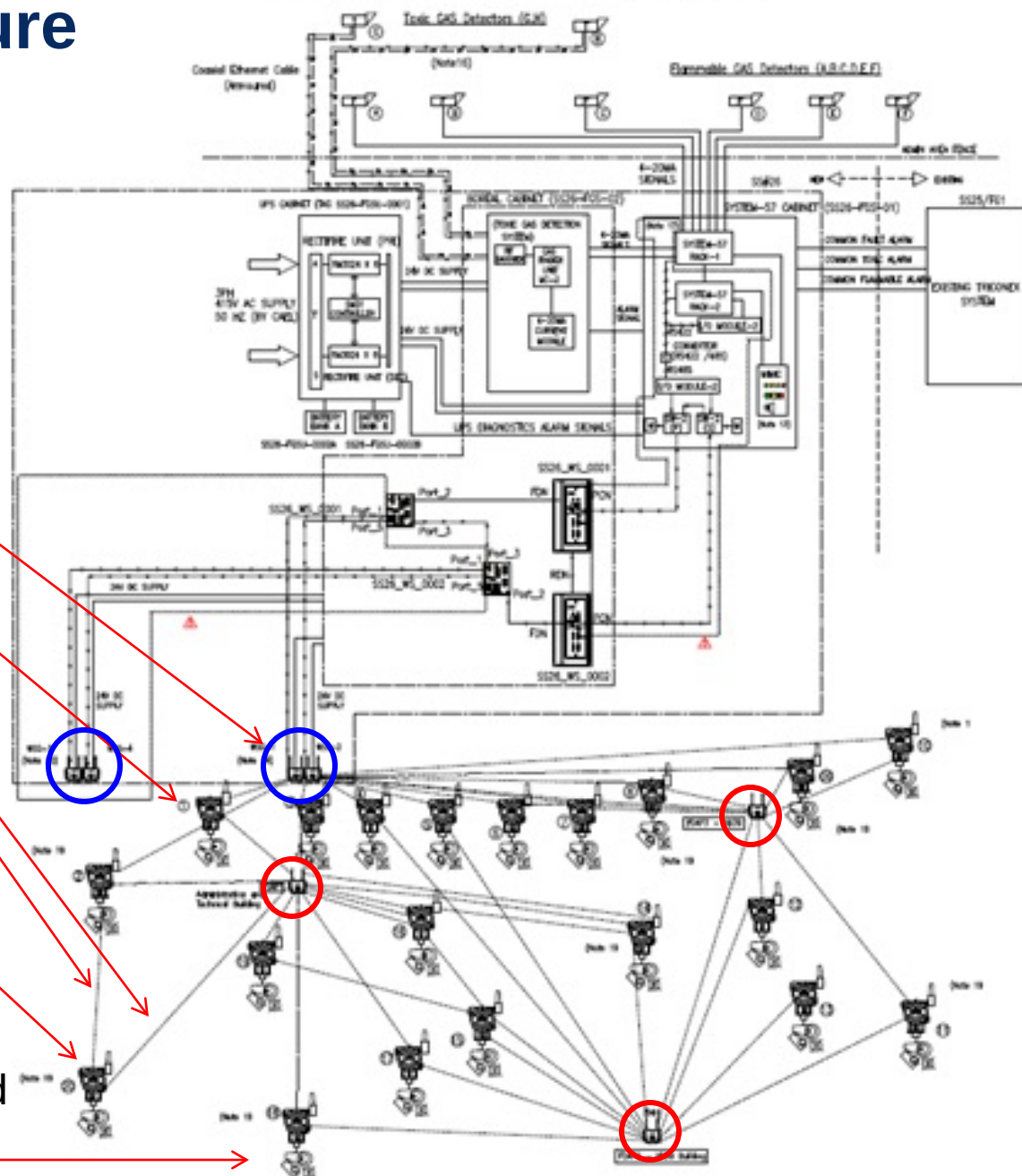
ISA100
Wireless
COMPLIANT

Network Architecture

ISA100 Wireless Technology

- Scalability
 - Access points
 - Red circle = field routers
 - Blue circle = BBRs
- IP addresses for all devices
 - IPv6
- Dual communication paths
- Mesh and non-meshing in one network
- Control ready
 - 1 second update rates and good battery life

OVERALL NETWORK ARCHITECTURE



FDAP (BBR function)

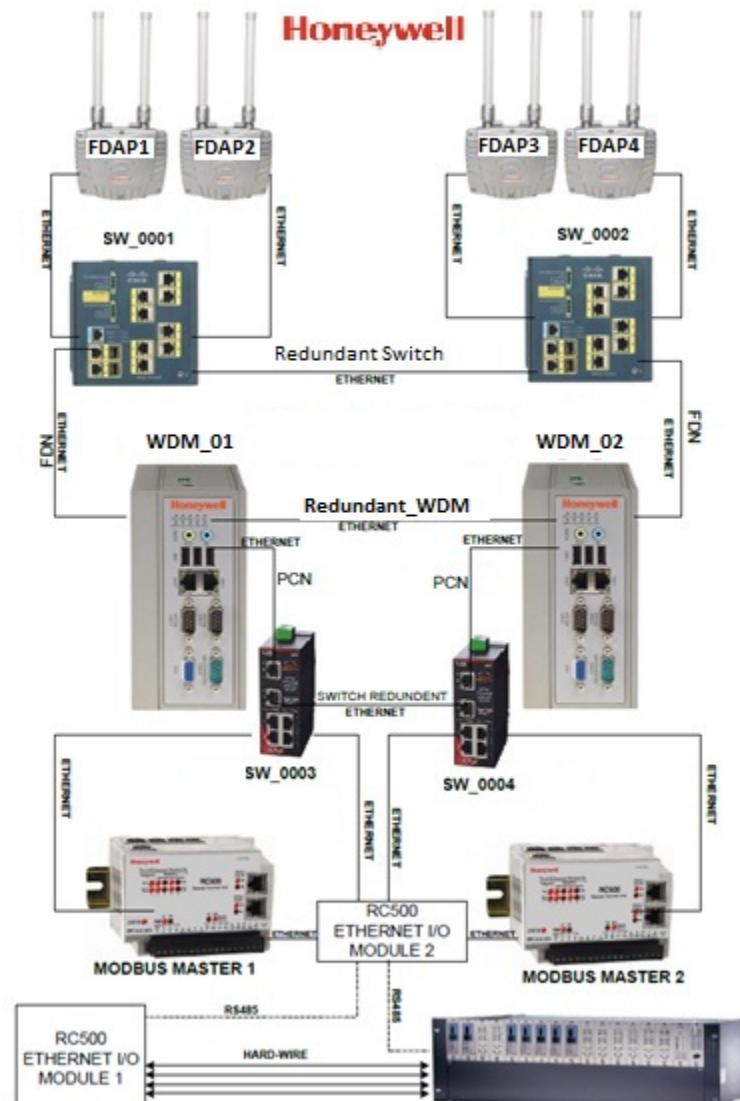
Redundant Ethernet
Switch

Redundant WDM
(gateway function)

Redundant Ethernet
Switch

MODBUS Master

Ethernet Module



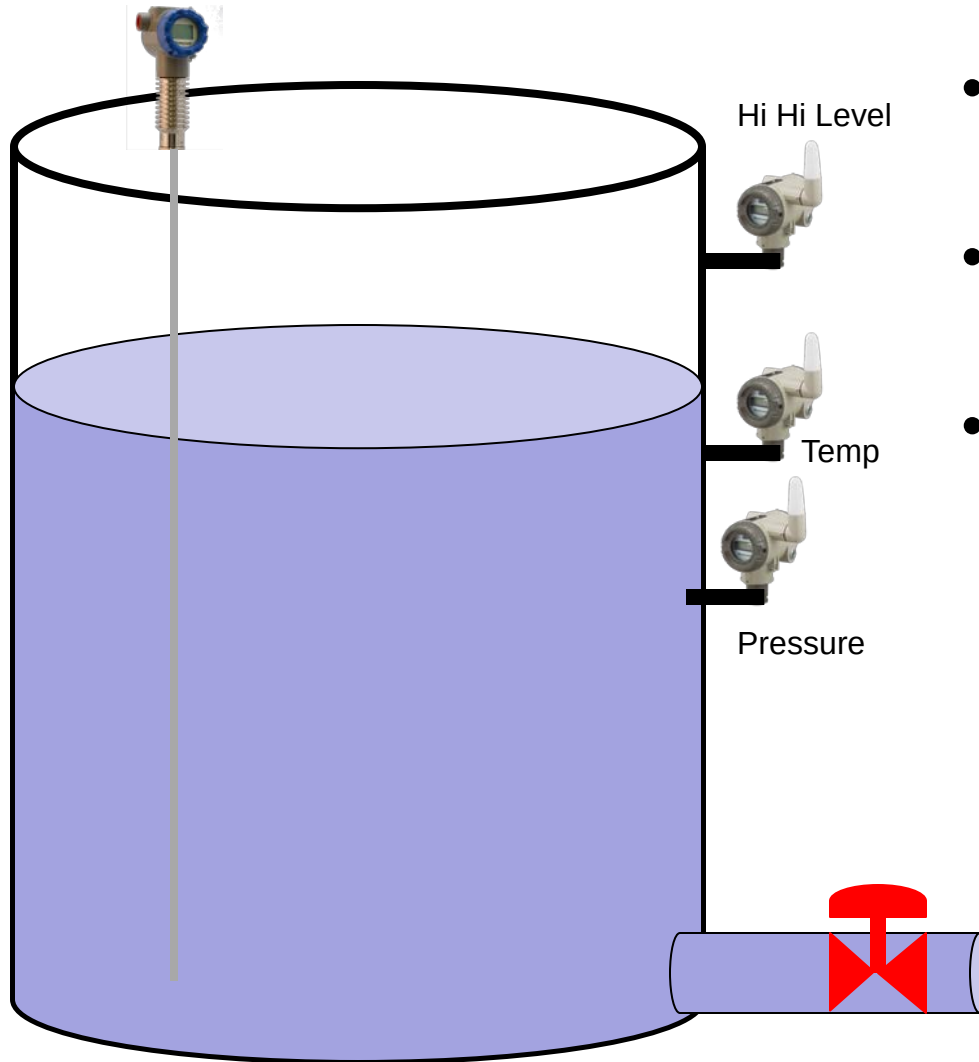
- From the beginning, the end-user understood that identifying the right wireless infrastructure at project outset was critical for a successful implementation.
- The requirements for the wireless infrastructure were based on the following fundamental principles:
 - security,
 - scalability,
 - a field-proven track record, and
 - experienced professional support.
- End-user management as well as the Engineering & Procurement Contractor were involved in all aspects of the project
 - from selecting the technology to providing support during the project deployment,
 - to mapping future technology needs.
- At all stages the Honeywell experts worked in close cooperation with the EPC appointed by the end-user.

Presentation Topics



- ISA100 Wireless User Requirements
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- **Wireless Tank Level Measurement**

Wireless Tank Level Measurement



- Wireless as part of a Safety Protocol
- Provides a redundant tank level measurement
- Provides high high alarm from the same for primarily overfill warning purposes

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Oil Corp officials arrested

2 Jul 2010, 1706 hrs IST, AGENCIES

Police have arrested
on Friday
that killed
Sec 304-

Nine Oil Corp officials arrested in blaze case

By NS,

Nine Oil Corporation officials, including general manager have been arrested for criminal negligence in a major fire at its depot in October last year in which 11 people were killed, police said Friday.

"We have arrested nine officials under various sections of the Penal Code including section 304 (culpable homicide not amounting to murder and carrying a maximum sentence of ten years in prison)," Inspector General B.L. Son told NS.

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OC fire: From basic checks to systems, guidelines ignored

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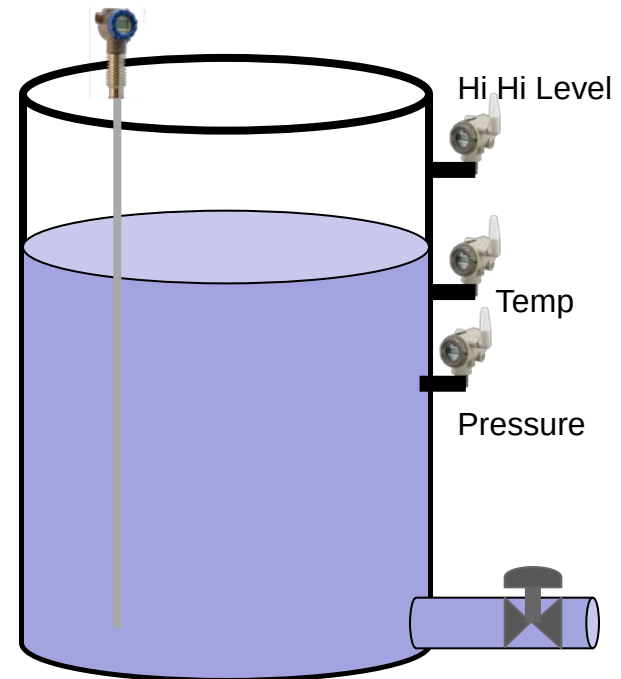
Posted: July 4, 2010 2:00 am

The Oil Corporation (OC) depot blaze in October, which claimed 11 lives, injured more than a 100 and led to the loss of close to 10 crore litres of fuel, might have been averted had basic safety norms set by the Oil Industry Safety Directorate (OISD) and OC itself been followed.



Benefits

- Lowest cost
- Fast implementation, least disruptive to existing operations
- Independent network from existing control or monitoring system
- Safety and compliance project justification



- Both examples use wireless in association with a safety purpose.
 - Safety audio and visual alert system to alert personnel
 - Redundant process input for high high level alarm on tank overfill protection
- Both examples address a compliance requirement.
- ISA84 WG3 is developing guidance in a Technical Report for applying wireless sensor technology to non-SIS independent protection layers (IPL)

Thank You

- The Honeywell OneWireless solution deployed at this project is a ISA100 Wireless infrastructure comprising of FDAP (Field Device Access), WDM (Wireless Device Managers) and XYR 6000 Wireless Universal I/O transmitters including redundancy on the WDM for redundant interface to the Safety PLC. The primary components of the solution are:
 - Honeywell OneWireless™ Network
 - Fire and Gas Detection Devices
 - Safety PLC
 - WDM (Wireless Device Manager)
 - FDAP (Field Device Access Point)
 - Field Mounted FDAP (Field Device Access Point)
 - XYR 6000 Wireless Universal I/O Transmitters
 - Audio/Visual Alarm Kiosks/Booths

Three Second Challenge – SAT Results



- During the FAT as well as the SAT the Honeywell OneWireless network performed flawlessly and exceeded the customer expectations. The system managed to consistently realize an activation time of 2.9 seconds.
- The customer put the system through rigorous tests that were beyond the scope of the tests to display redundancy, fail-over and network stability. The wireless system withstood all their tests and attempts to show flaws and displayed its resilience and ruggedness.
- The customer was extremely happy with the Honeywell OneWireless Solution and did not expect such smooth system performance during the test.

- Wireless solution meets all stringent latency requirements and allows the end-user to ensure personnel safety and easy evacuation of the administrative-area buildings should a toxic gas leak occur.
- Flexibility and security were important selection criteria for the end-user. Honeywell's OneWireless Network makes it possible for the end-user to obtain measurements in remote and hard-to-access locations.
- Wireless systems also work consistently and reliably in areas previously considered impractical or off limits. In addition, the lower cost per I/O input/output device with wireless can help justify projects not feasible with wired transmitters.
- Honeywell was the only vendor able to provide an end-to-end solution covering all aspects of the customers requirements including ISA100 Wireless infrastructure, H₂S gas detectors, gas panel PLC, fire and gas end devices, solar power, and a SCADA system.