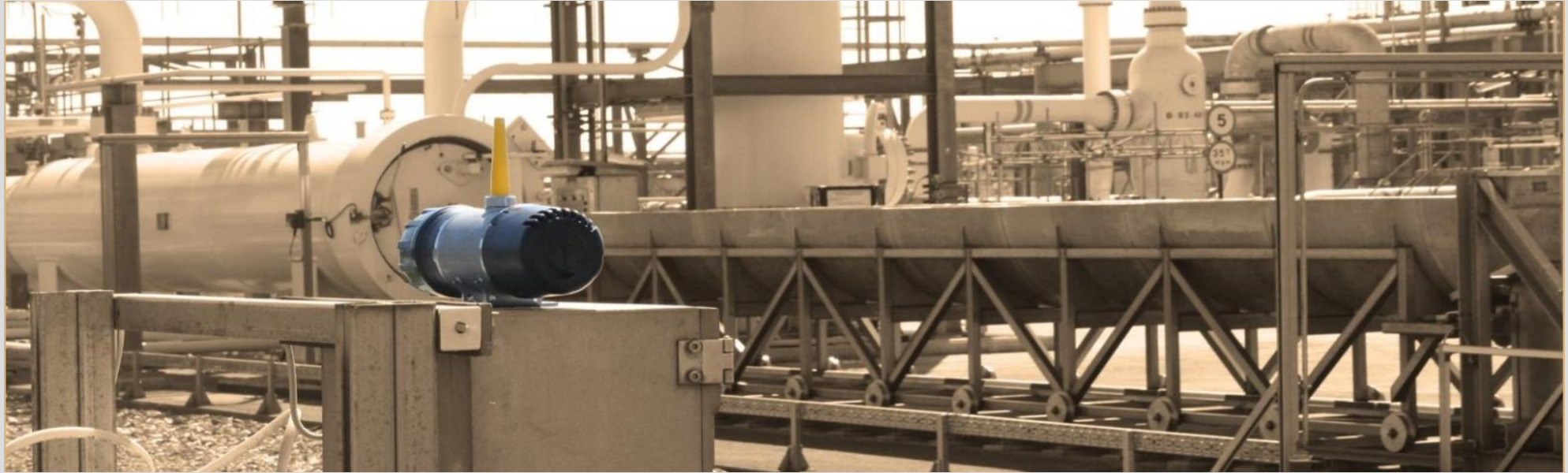
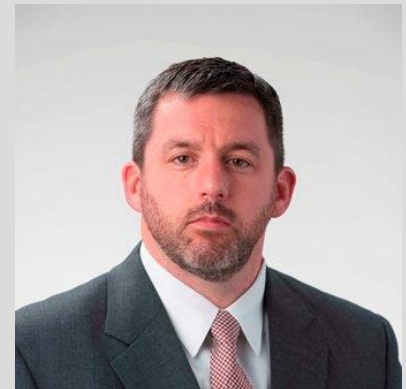


Wireless Gas Detection Systems in the Context of Safety Critical Applications



GAS
SECURE
A Dräger Company



Wireless Gas Detection Systems in the Context of Safety Critical Applications
John Wilson, Vice President Dräger North America

Upgrades Revamps Expansions Additions

- Install alongside existing wired system
- Fill gaps in detection coverage

Resource Limited Upgrades

- Time, space and/or weight constraints

Limited Access / Limited Utilities

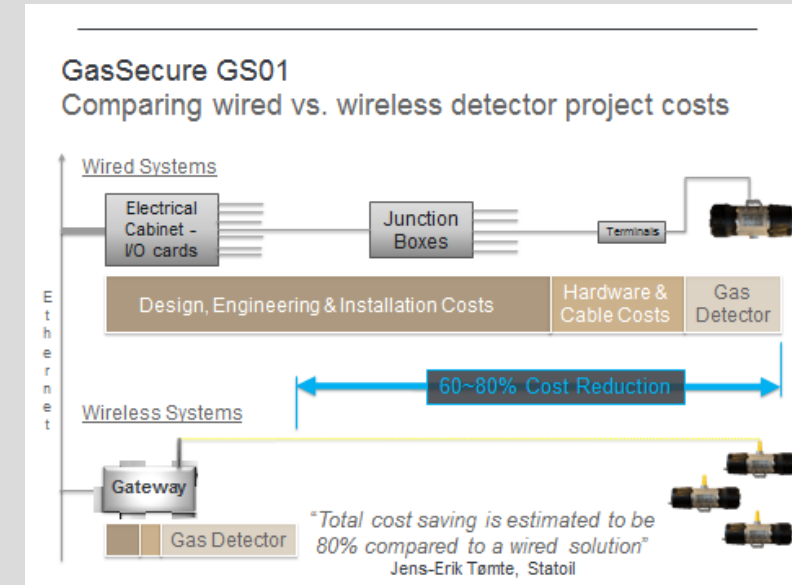
- Hard to wire areas (FPSO turrets, cranes, confined areas)

Temporary Cover / Work Habitats

- Cover during site maintenance activity

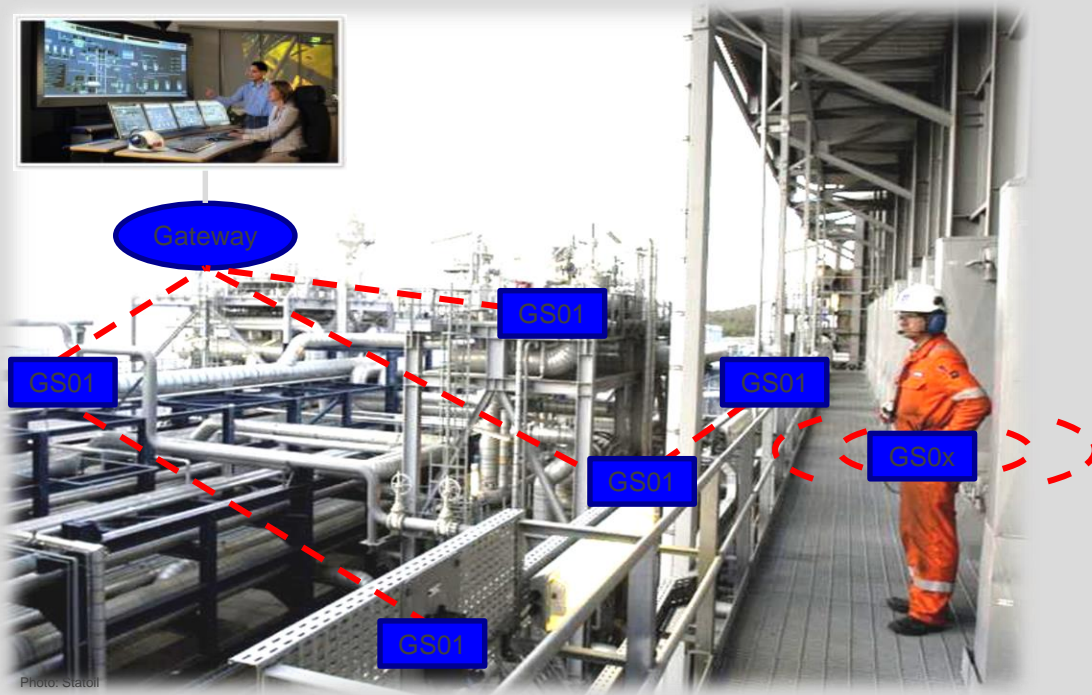
Reduced Costs

- Project costs reductions of 60~80% possible

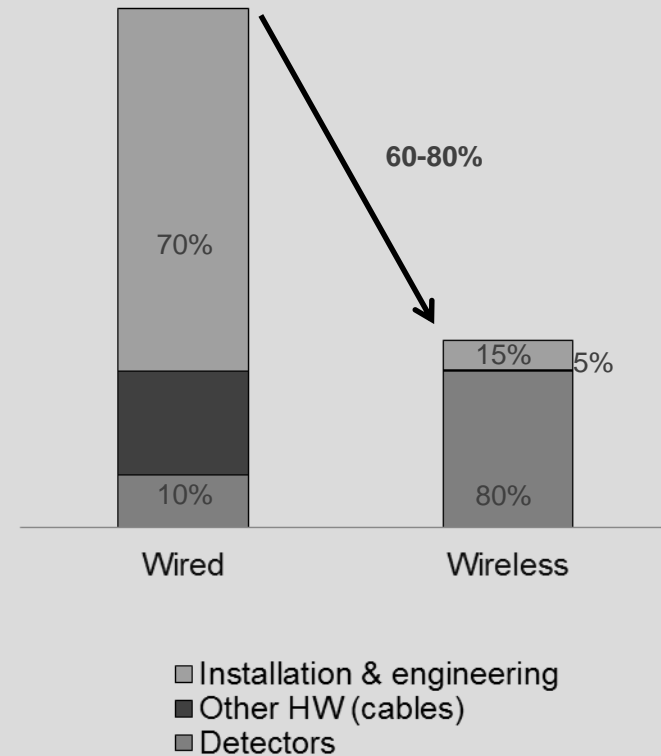


Wireless Detectors Increase Safety with Higher Coverage and Reduce System Costs by 60-80%

Easy installation, increased flexibility...



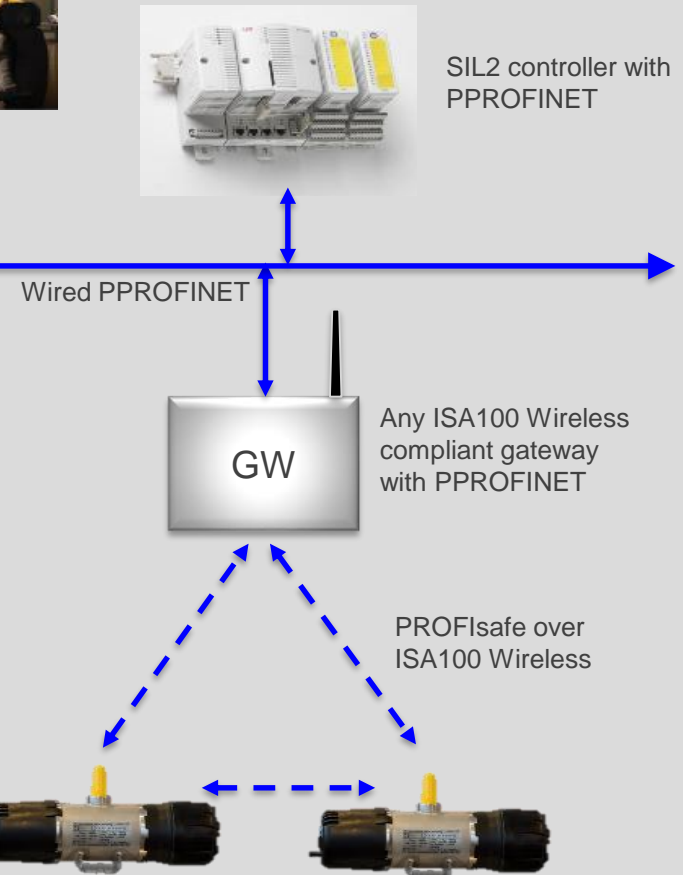
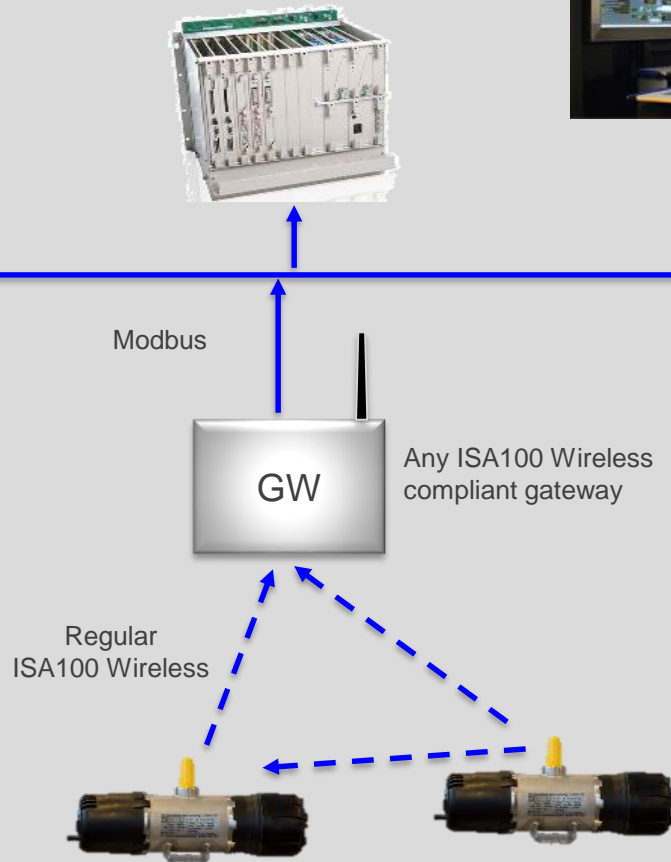
...and reduced system costs



SIL2 Compliant Systems on Top of Standard Wireless Protocols

Non-SIL

SIL2



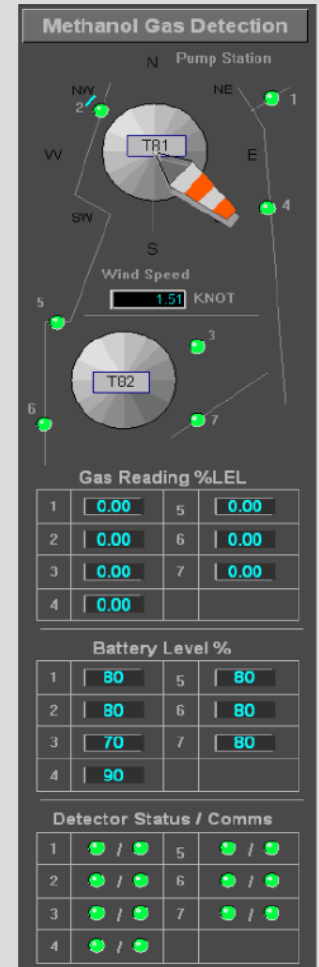
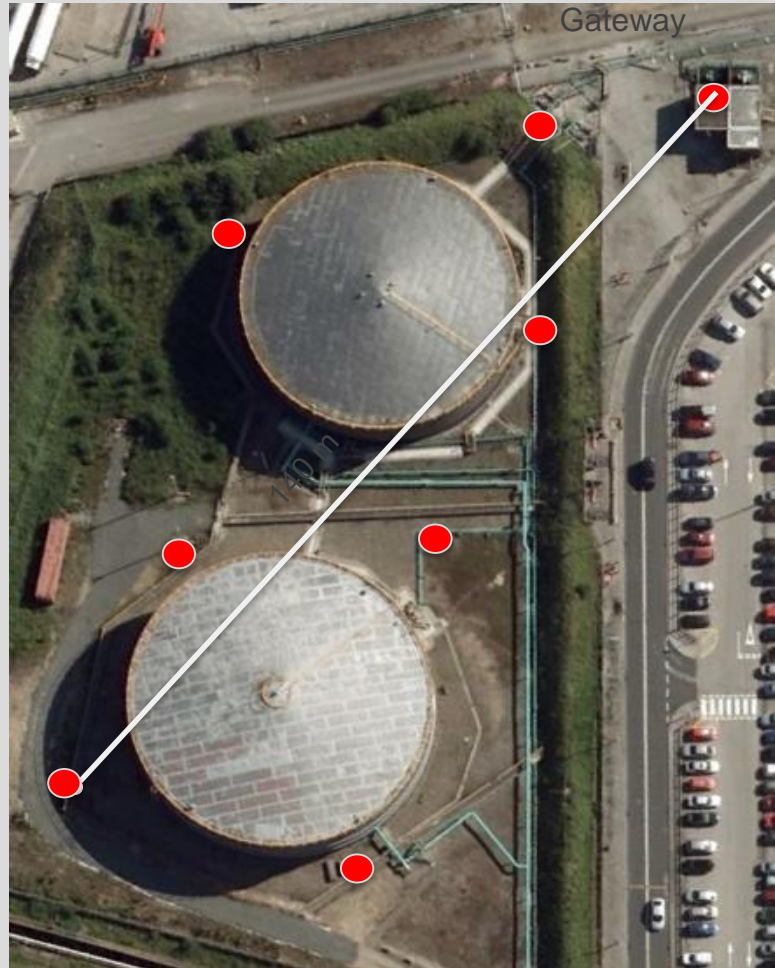
Remote Tank Farm Gas Monitoring System

- **Project Overview**

- 7 Detectors
- 1 Gateway
- Integration to Honeywell TDC 3000
- Simple HMI for alarm and status display

- **Highlights**

- Remote area, open field around the tanks, no radio signal reflections that could “carry the signal around”
 - Several detectors used as routers (3 hops allowed)
- Simple and fast installation (half day)



GAS
SECURE
A Dräger Company

Offshore Gas Detection with Executive Actions and Integration into Safety System

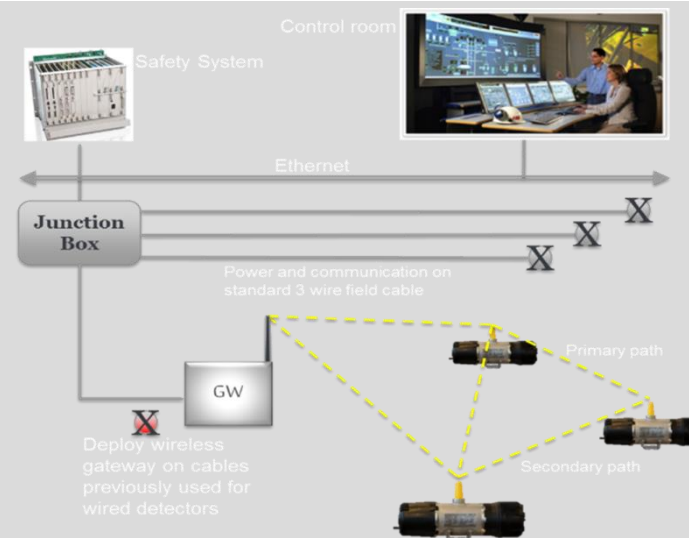
Operations and Execution Highlights:

Operations:

- Flexible system– easy to expand
- Easy to install additional layers of detectors if needed
- Easy to replace catalytic detectors that fail
- Easy to relocate detectors if process requires
- Platform operational staff can easily add detectors

Project execution:

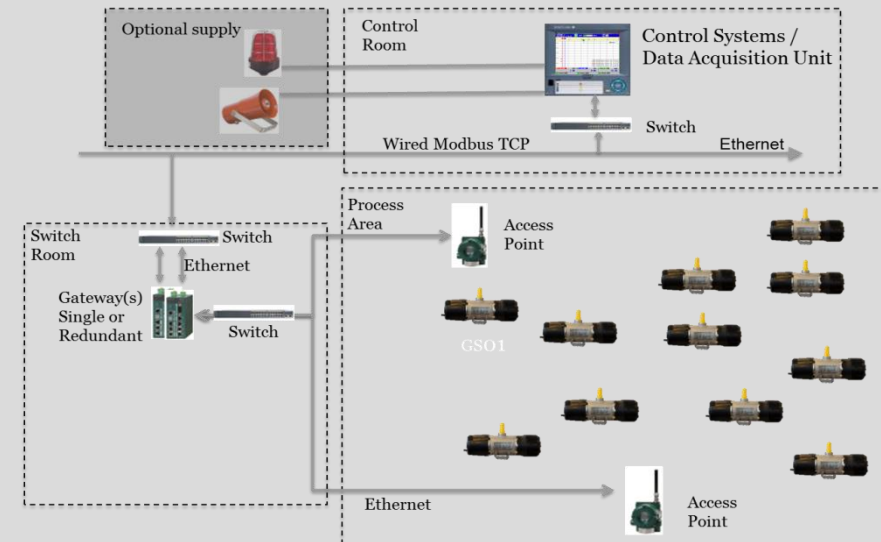
- Less installation, shorter installation period
- Less disturbance of operations
- Less work inside FTC (Field Termination Cabinet)
- Less loop testing with fewer field cables
- No new multicore cables



Description	Conventional solution	Wireless solution
Detector, IR line	23	9
Detector, IR point	45	8
Detector, IR point wireless	0	67
Wireless router	0	10
Removal catalytic	0	3
Multicore new (16)	515	0
Multicore new (8)	1205	0
Field cable new	3545	1370
Field cable removal	0	60
6mm Tubing	360	672
Removal tubing	0	24
Junction box new	6	0
Cable tray 100mm	611	164
Cable tray 300mm	30	0
Cables through MCT	31	2

Major O&G terminals / tank farm monitoring

- **Project Overview**
 - 144 GasSecure GS01 installed in 2014 and 2015.
 - Integrated system for standalone site alarms.
 - Access Points connected on existing Ethernet
- **Highlights**
 - Detectors mounted in hard-to-wire tank bund area
 - Variety of high temperature arid & humid environments
 - Minimised project cost made project viable and enhanced detector coverage.
 - SAT pre-completed in factory before installation.



Summary User Benefits

Performance	Faster sensor response time, stability, harsh weather capability with same or better performance as wired infra red combustible gas detection systems.
Installation time	90~95% reduction in installation time compared to wired systems. Pre configuration / Pre SAT provides less onsite engineering time.
Weight and footprint	Reduced cable / trays / junction box weight. No cables or trays. Smaller junction boxes and cabinets.
Easier engineering	Detector placement is flexible at site Easier to upgrade with more detector points. Option to reuse existing cable runs and installation.
Maintenance	No recalibration costs Full diagnostics and 2 year battery life
Summary	60~80% reduction in total system costs (<i>ref: Statoil</i>) without compromising safety performance.

**Thank you for
your attention.**