



Wireless Gas Detection Systems in the Context of Safety Critical Applications

SIL2 and Non-SIL Application Case Studies

Process Safety and Control Symposium, Houston, Nov 11th 2015, Dr. Carsten Buschmann

SIL2 Compliant Systems on Top of Standard Wireless Protocols

Non-SIL

SIL2

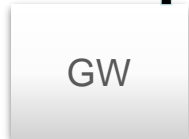


SIL2 controller with
PPROFINET

Modbus

Ethernet/Modbus

Wired
PPROFINET



Any ISA100 compliant
gateway



Any ISA100 compliant gateway
with PPROFINET

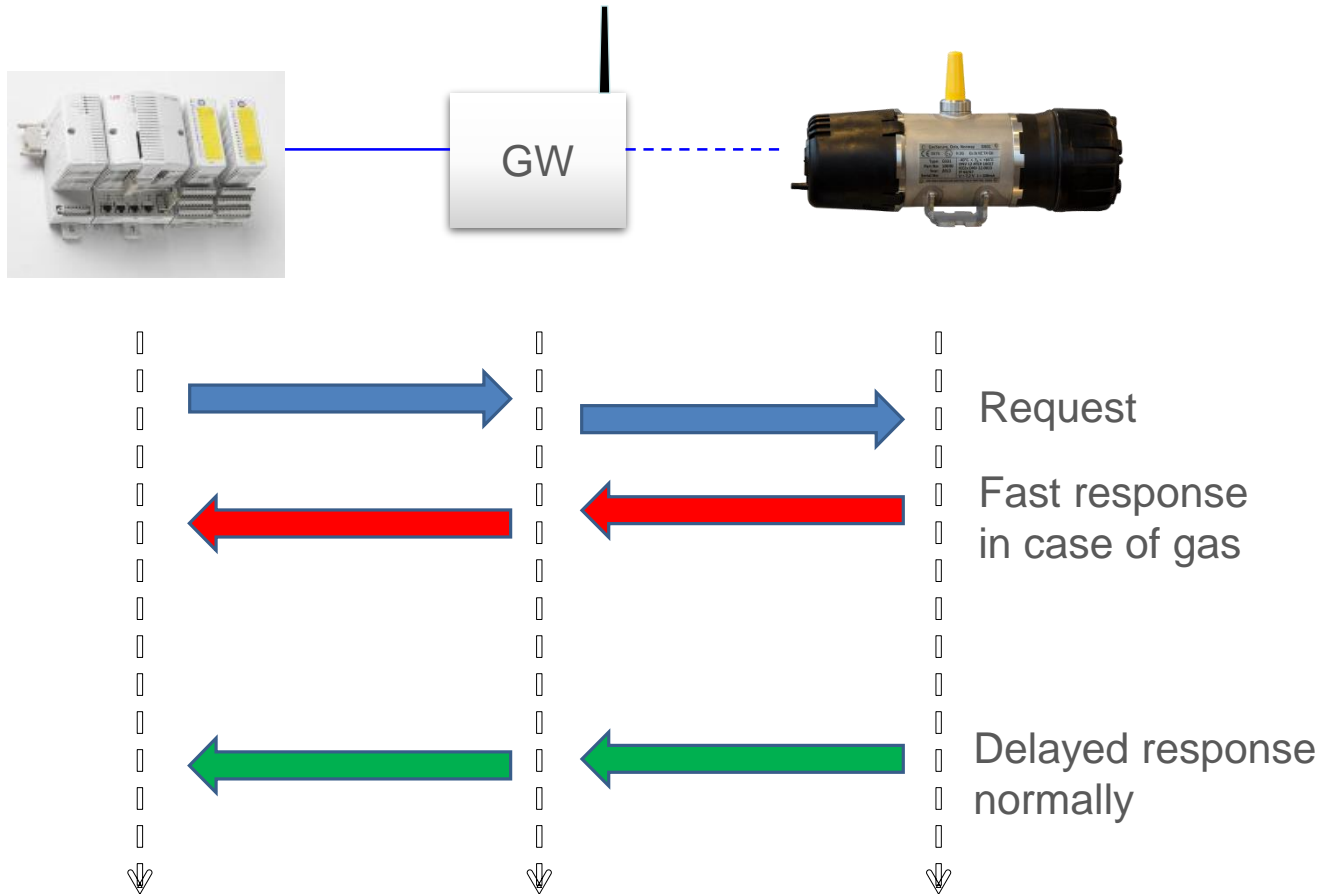
Regular ISA100.11a



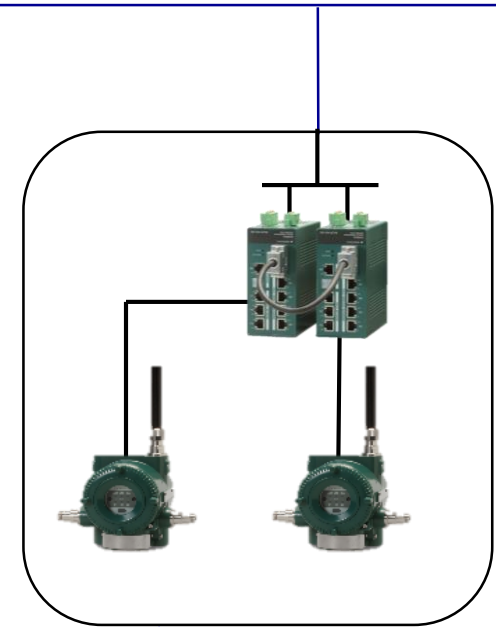
PROFIsafe over ISA100.11a



Bandwidth Reserved for Fast Response



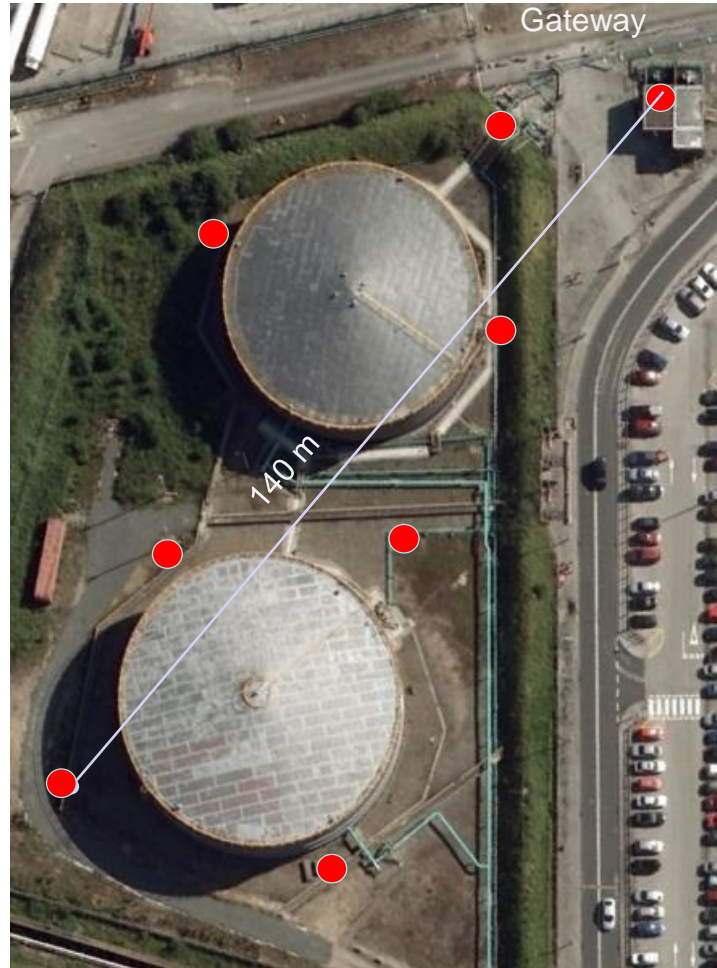
Wireless System Options



Remote Tank Farm Gas Monitoring System



- Installed: March 2013
- 7 Detectors
- 1 Gateway
- Highlights:
 - Remote area
 - Very easy installation (half day)
 - Integration to Honeywell TDC 3000



Methanol Gas Detection

N Pump Station

Wind Speed
1.51 KNOT

Gas Reading %LEL			
1	0.00	5	0.00
2	0.00	6	0.00
3	0.00	7	0.00
4	0.00		

Battery Level %			
1	80	5	80
2	80	6	80
3	70	7	80
4	90		

Detector Status / Comms			
1	● / ●	5	● / ●
2	● / ●	6	● / ●
3	● / ●	7	● / ●
4	● / ●		

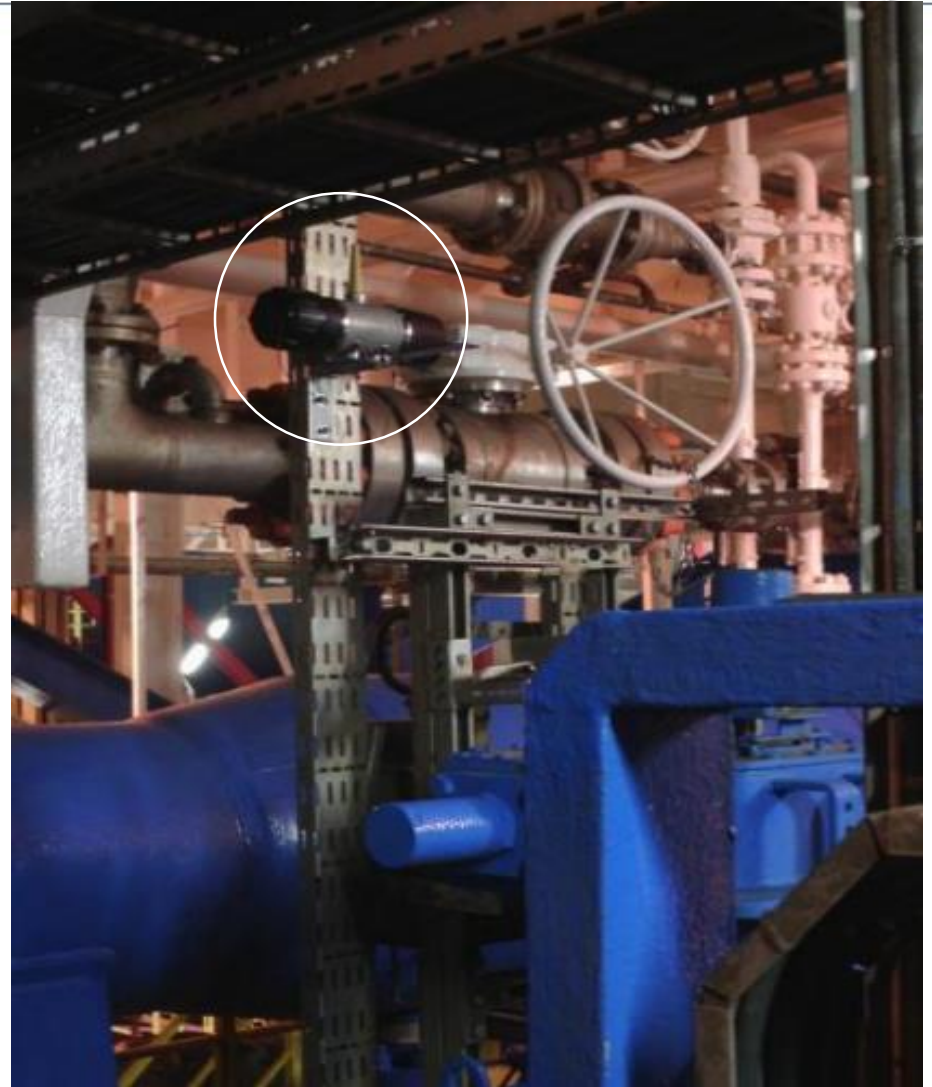
Gas Detection with Executive Actions and Integration into Safety System

Upgrade Project

- Replace wired combustible detectors
- 73 units GasSecure GS01
- Integrated into Siemens S7 control system
- Sixteen fire zones
- 90-95% reduction in installation time
- 80% cost saving compared to wired



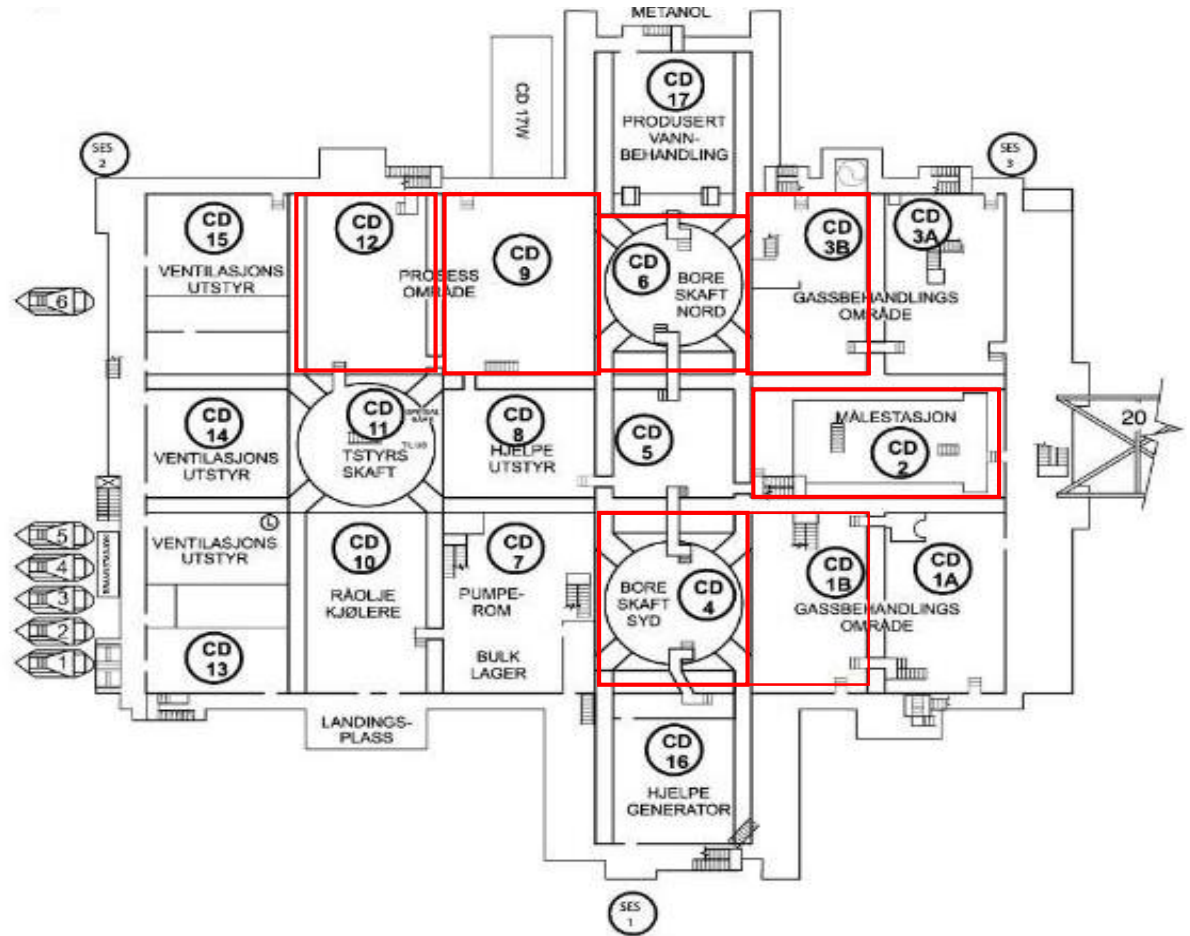
Typical GS01 Detector Placement



Enclosed Fire Zones with one Gateway per Zone

Layout – Cellar Deck (Fire Zones)

- CD1B = 3 GS01
- CD2 = 2 GS01
- CD3B = 7 GS01
- CD4/M8 = 8 GS01
- CD6/M6 = 5 GS01
- CD9 = 9 GS01
- CD12 = 10 GS01



Study by EPC Showed Significant Savings with Wireless



Description	Conventional Solution	Wireless Solution
Wired Detector, IR Line	23	9
Wired Detector, IR Point	45	8
Wireless Detector, IR Point	0	67
Wireless Router	0	10
Removal Catalytic	0	3
New Multicore Cable	1720 m	0 m
New Field Cable	3545 m	1370 m
Field Cable Removal	0 m	60 m
Junction Boxes	6	0
Cable Tray	641 m	164 m
Cables through MCT	31	2

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

Easy installation, increased flexibility...

...and reduced system costs

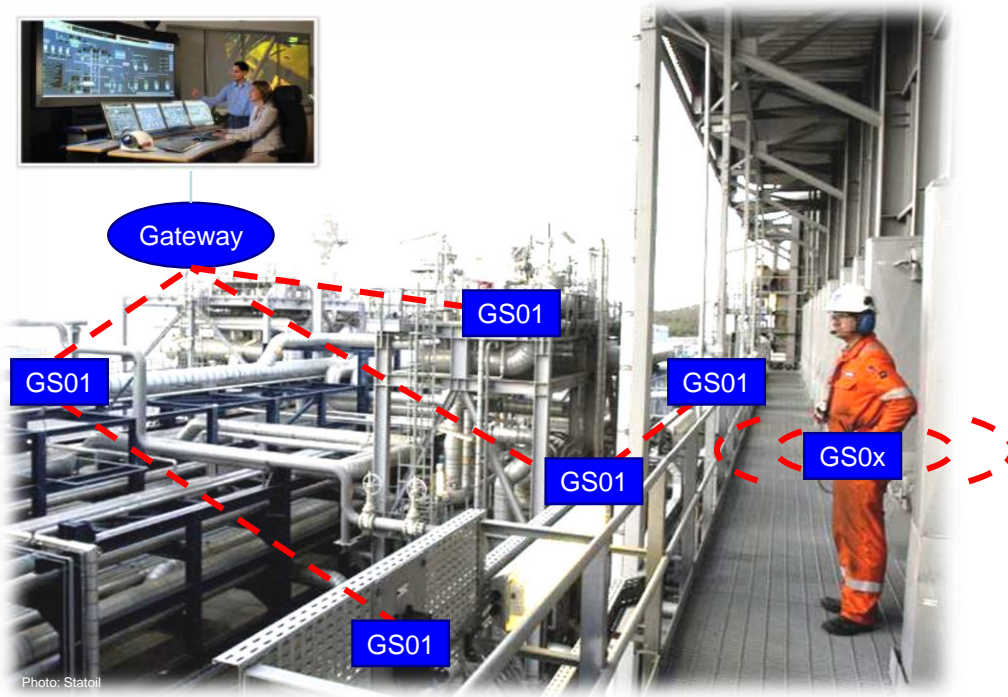
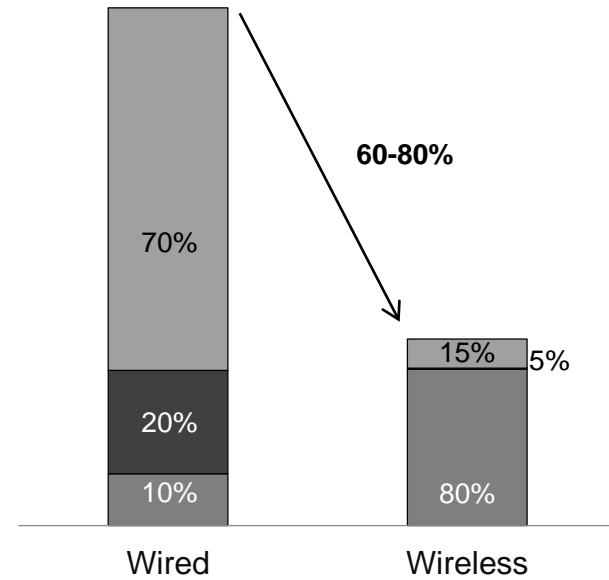


Photo: Statoil



- Installation & engineering
- Other HW (cables)
- Detectors

Thank you for your attention.

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