



Industrial Wireless - Enabling Safety

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Agenda

- Background
- Wireless as Enabler
- Case Studies



HSE Regulations Continue to Increase

EPA's Clean Power Plan

"Estimates are that it will cost the power industry up to \$480B over the next 15 years to comply."

NERA Economic Consulting

Tighter Emission Controls for Automobiles

"Rules are likely to cost Refiners \$10B in capital costs and \$2.4B/year in compliance expenses."

Baker & O'Brien Consulting

National Emission Standards for Hazardous Air Pollutants

"Estimated cost to the Oil & Gas industry for compliance will be \$170M annually."

Environment Protection Agency

Boiler MACT

"The final boiler MACT rule is estimated to cost the Pulp & Paper industry \$3B."

Pulp & Paperworkers Resource Council

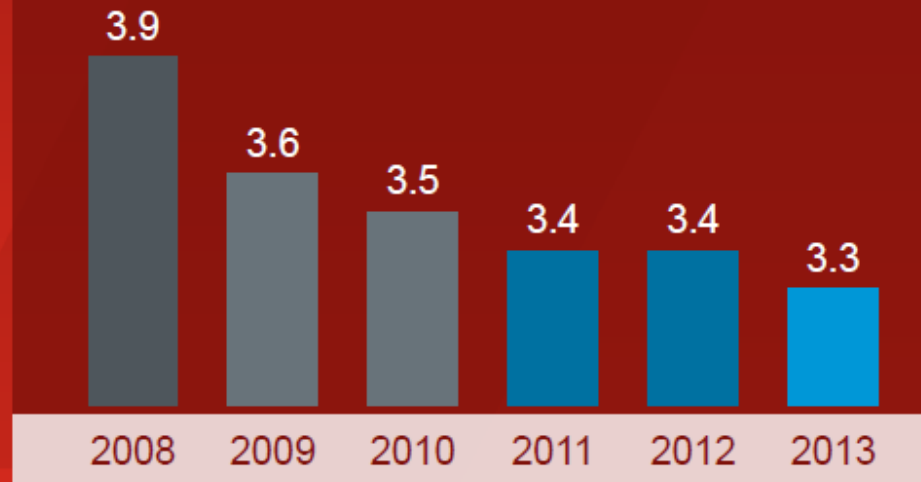
Safety Remains the Highest Priority but Plateauing

Incident rate continues to drop, however

0

is the goal

Total Recordable Incidents per 100 Full Time Workers



Source: US Bureau of Labor Statistics, December 2014

Challenges

Asset monitoring



Inventory Management



Explosions



Limited access to critical data



Unmonitored Areas and Processes



Spills and HSE threats



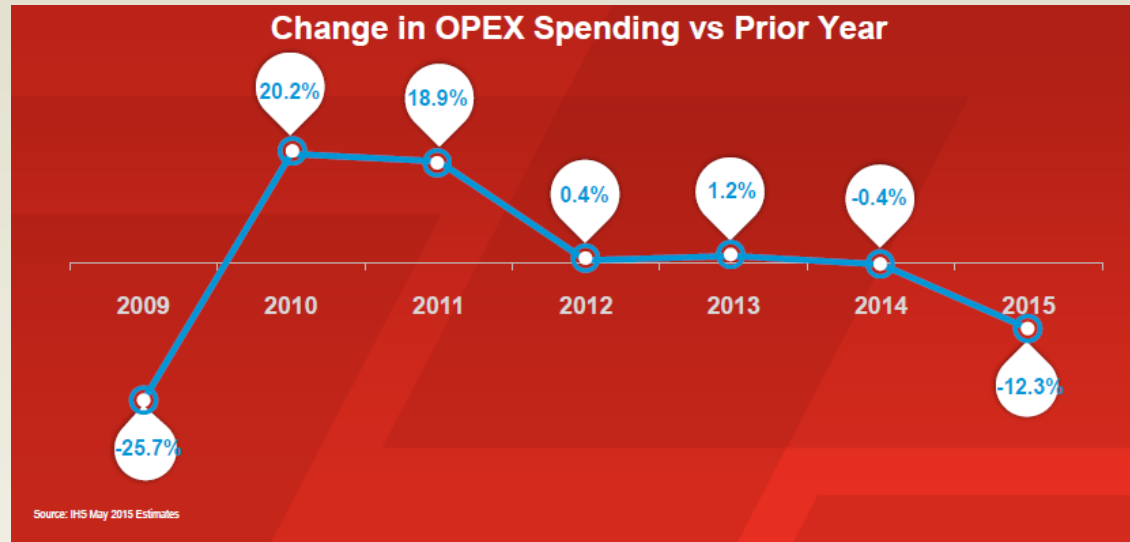
Deteriorating infrastructure



And Even Bigger Challenge...

2015 Americas CAPEX (\$B)		CAGR 2010-14	CAGR 2014-15
Oil & Gas	\$280	12%	-28%
Power	\$160	2%	3%
Batch	\$100	1%	0.5%
MMM	\$90	6%	-7%
Chemicals	\$60	3%	2%
Refining	\$40	-2%	-10%
P3	\$20	9%	0%
Water	\$15	2%	-5%
Total \$ 760M			

Source: IHS May 2015 Estimates



Do More with Less CAPEX and OPEX...

Wireless is The Enabler

Lower CAPEX

Faster Deployment

Lower Maintenance



Process Monitoring

Level Measurement

Gas Leak Detection

Overfill / Spill Monitoring

Vibration Monitoring

Safety Shower Monitoring

Personnel Safety Monitoring

Video Monitoring

Utilizing the Enabler

- Time Critical Perimeter Monitoring
- Oil Storage Terminal Safety Compliance
- HSE Regulations Compliance
- Customer Innovation
 - Using Wireless for Enhancing Safety

Case Study 1

Perimeter Monitoring – Time Critical

LNG Facility in Middle East - Brownfield

Challenges

- Alarming system for detection of gas leaks without extensive cabling.
- Meet 3 seconds alarm requirement.

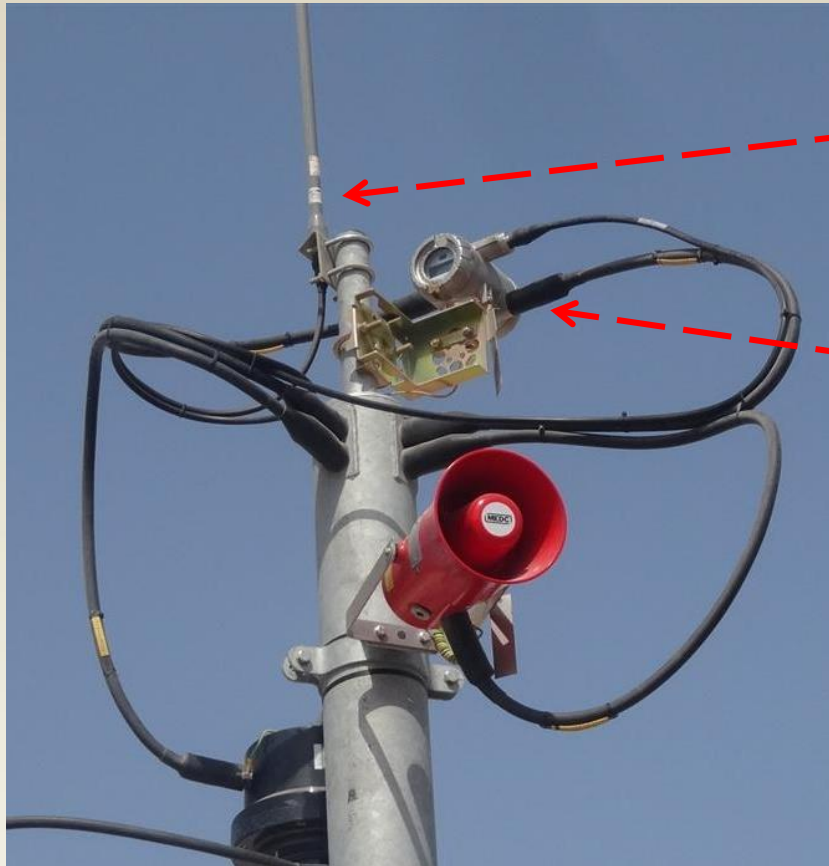
Solution

- FDAP based ISA100 Wireless network with XYR6000 Universal Transmitters and solar power panels.
- Fully redundant system end to end.

Results

- Improved site safety system within budget.
- 3 seconds alarming requirement met.
- Compliance to government regulations for HSE.





Remote antenna

Honeywell XYR 6000
Universal I/O wireless
transmitter featuring
both DI and DO



“...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.*”



Case Study 2

Meeting Safety Compliance

Tank Farms across India - Brownfield

Challenges

- Secondary level tank gauging to meet safety compliance - M B Lal recommendations
- 49 locations spread out around the country
- Require end to end solution within budget

Solution

- Honeywell Enraf FlexLine ISA 100 Wireless with OneWireless Network using FDAPs
- Total 90 FDAPs, 98 WDMs and over 550 Enraf FlexLine ISA100 Wireless radar gauges being deployed across the 49 locations

Results

- Compliance within budget and project schedule
- Consistent deployment across all sites
- Comprehensive solution to meet requirement



Case Study 3

Meeting HSE Compliance

Refinery South America - Brownfield

Challenges

- New environmental regulations required ENAP to monitor and collect environmental data for the water being discharged into the ocean.

Solution

- OneWireless Network
- Six OneWireless XYR 6000 High Level Analog Input Transmitters

Benefits

- Gained fast access to critical data that was previously unavailable due to rough terrain
- Met environmental regulations at a fraction of the cost of running wires
- Saved more than \$100,000 by avoiding the costs associated with wiring

“...We were able to gain quick access to data, meet stringent environmental requirements and save money by avoiding hard-wired costs...”

Ricardo Trujillo, ENAP Aconcagua Refinery



Case Study 4 Customer Innovation...

Refinery Middle East- Brownfield

Challenges

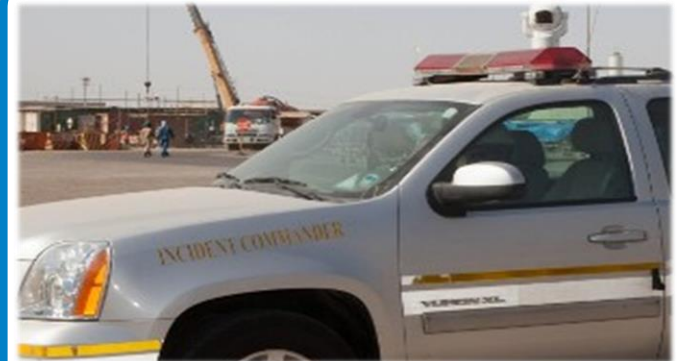
- How to make the emergency response command aware of the scene in real time.
- Increase effectiveness on emergency response.

Solution

- Site wide OneWireless Network with vehicles mounted with PTZ cameras, mobile computers and DVM solution.

Results

- Live feeds from incident commander vehicles help the remote command address the situation more effectively.
- Improved plant safety performance.
- Recording of the incidents and response helps continuous improvement (training).



Questions?

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