



Dynamiske støykart – tilgang til real-time støyinformasjon fra trådløse sensorer

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Noise risk management



- In Statoil, the number of work related illness has been dominated by hearing damage
- Noise is flagged as a major challenge in Statoil's HSE strategy
- Noise is a company-wide challenge

- Risk controls:**
1. Elimination/Substitution
 2. Technical solutions
 3. Organizational solutions
 4. Personal protection equipment

- Remove noise sources
- Reduce source emission
- Sound insulation

- Work time restriction
- Info and training
- Hearing protection

Introducing WiNoS – Real time noise maps

What is WiNoS

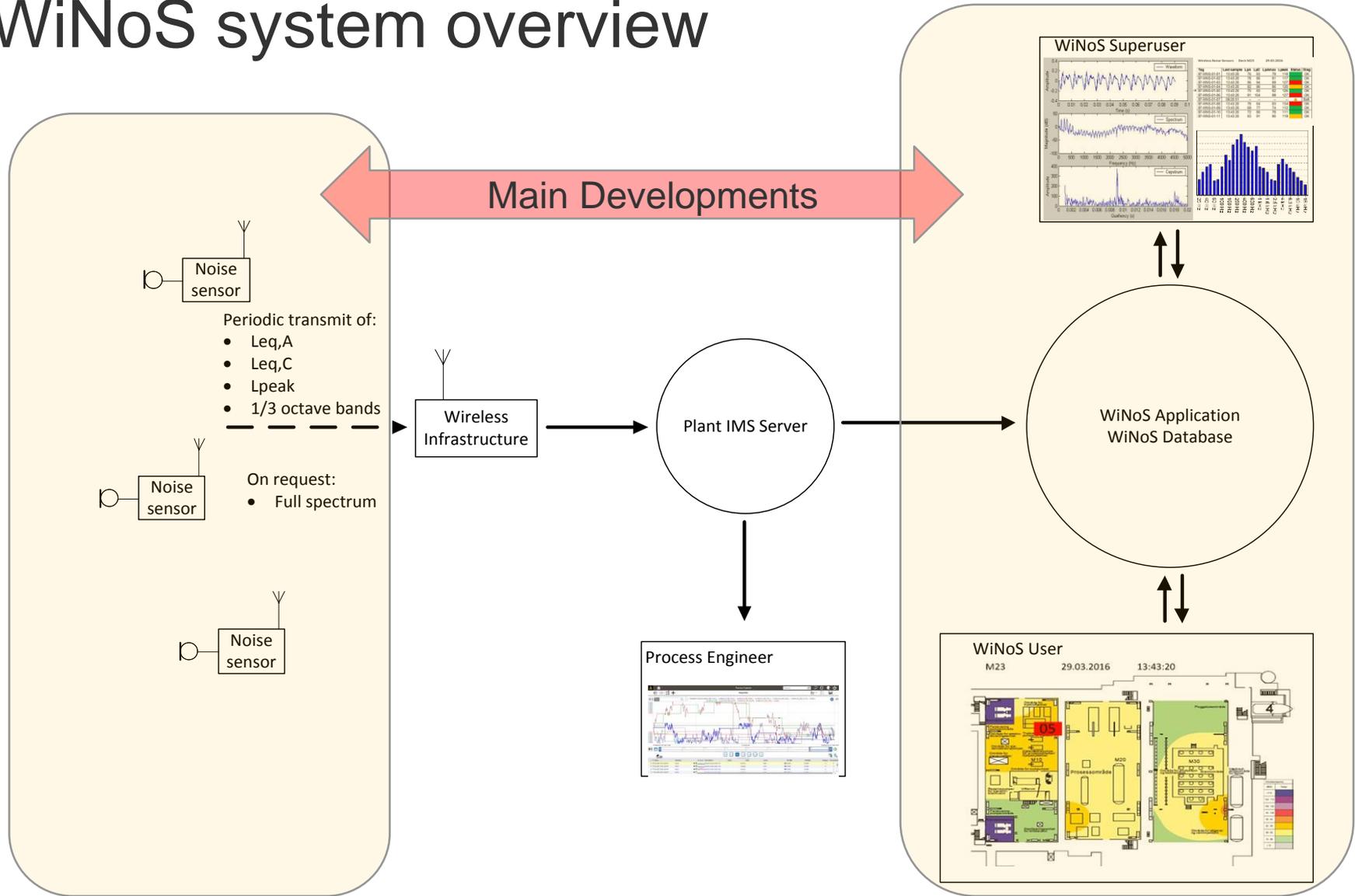
- WiNoS = **W**ireless **N**oise **S**urveilliance
- A network of wireless noise sensors, continuously measuring noise in the process area
- Industry standard wireless infrastructure
- Computer software for processing sensor data and producing graphical noise maps

WiNoS business drivers

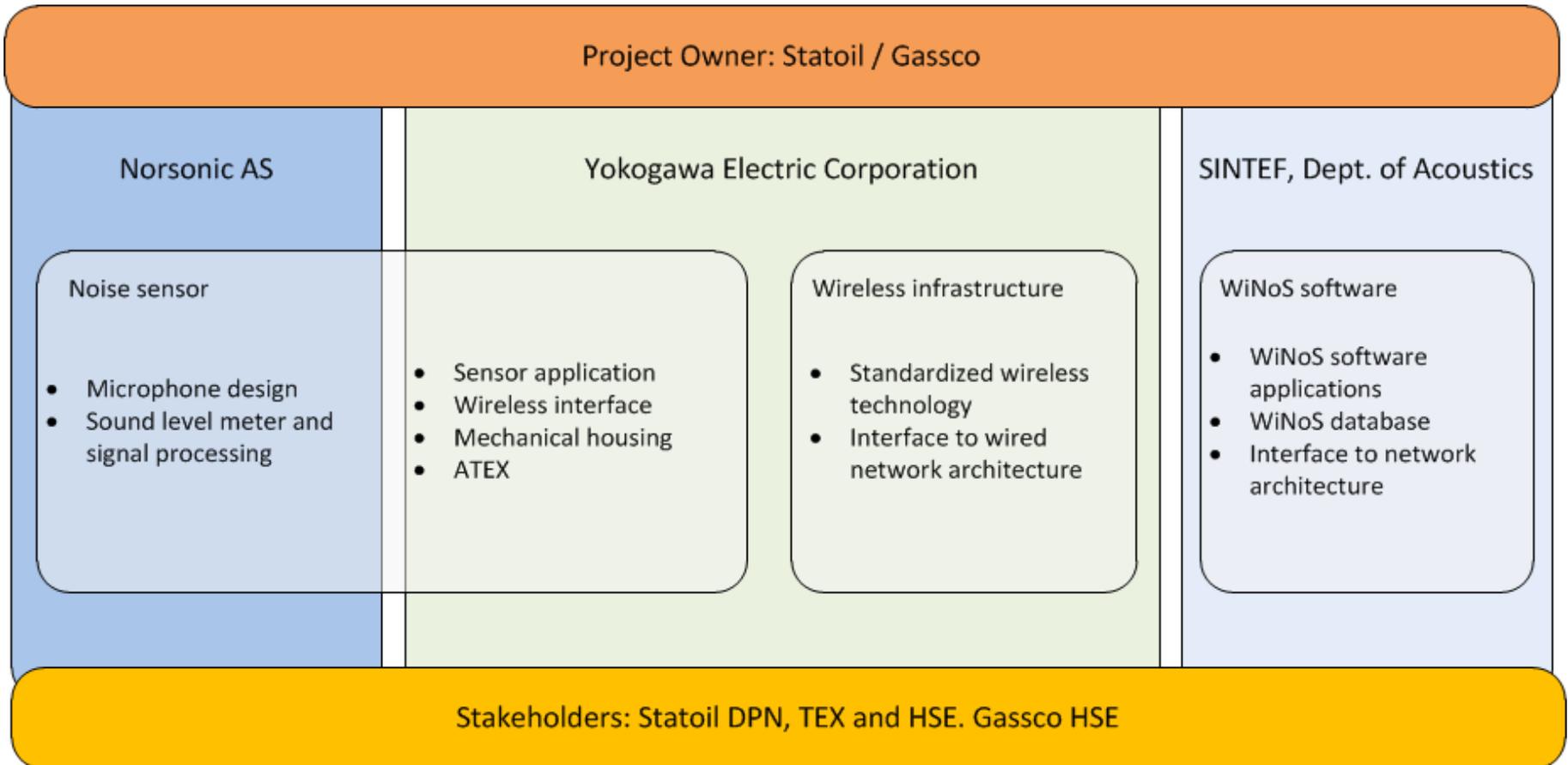
- Reduce work related hearing damages, by always providing an up-to-date area noise map
- Optimizing time-on-tools, since daily noise exposure can be predicted more precisely
- Instant feedback on the impact of any noise reducing measures
- Acoustical condition monitoring¹

¹ Future expansion, hardware already prepared

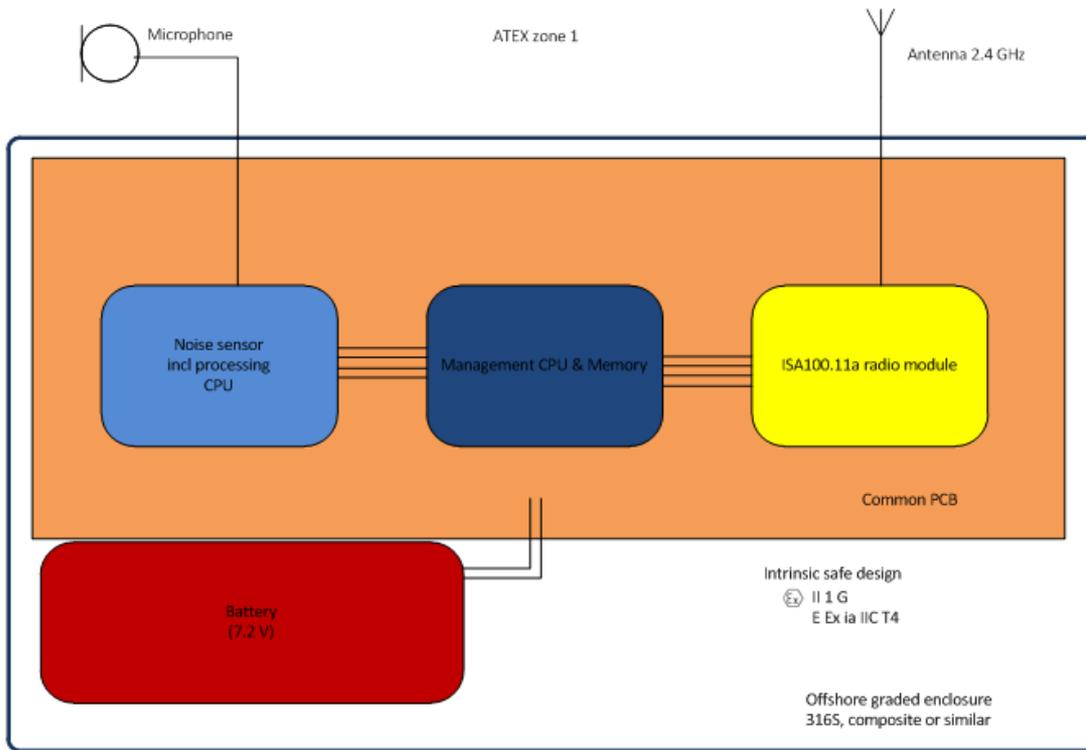
WiNoS system overview



The project organization



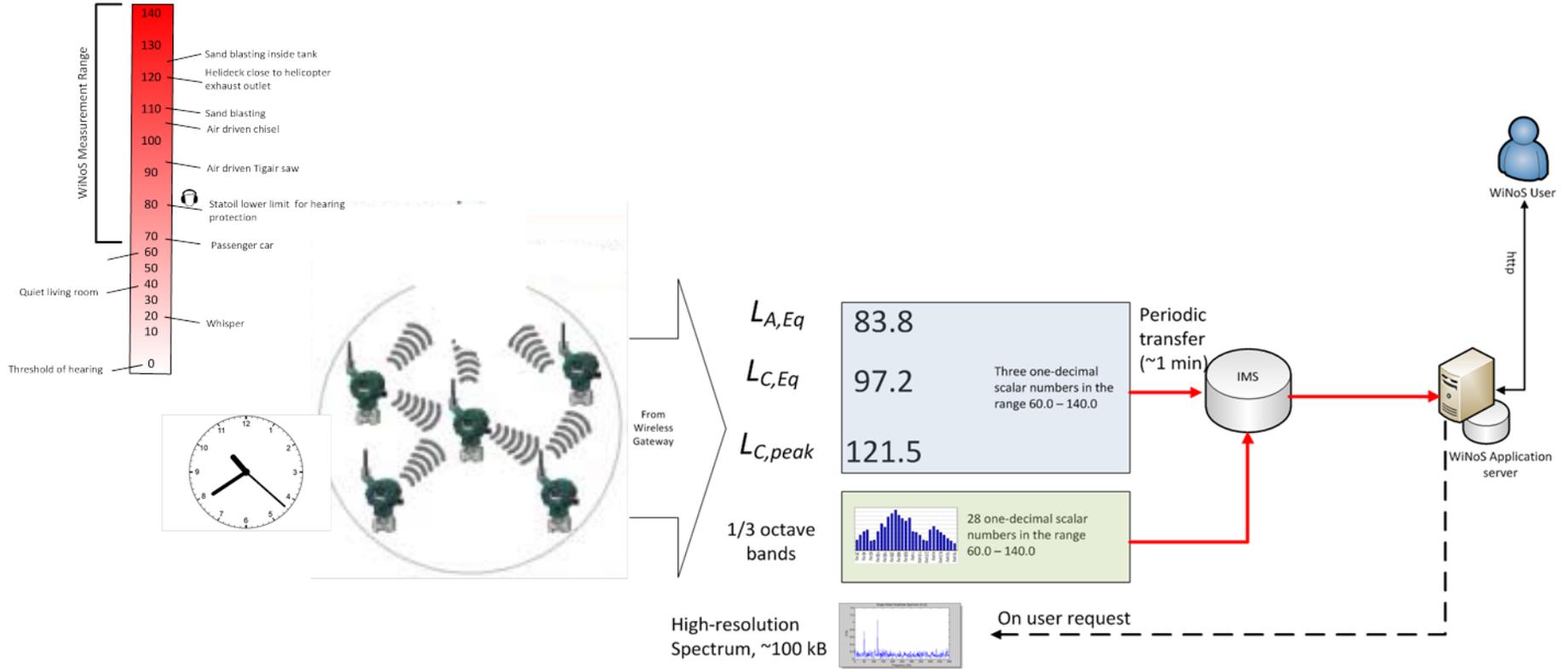
The noise sensor



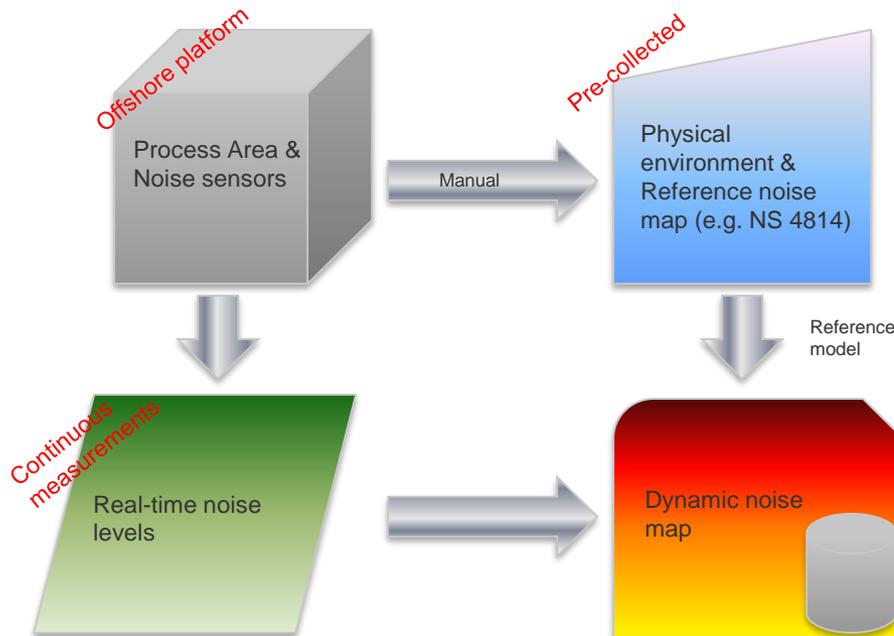
Requirements to sensor

- Battery operation, two years battery life time
- Industry standard wireless communication protocol, for license free operation globally
- Frequency range 25 Hz – 16 kHz
- Accuracy according to IEC 61672 class 2
- «Auto-calibration»
- Intrinsic safe design confirming to ATEX Group II, gaseous explosive atmosphere Zone 1 (ref (directive 2014/34/EU))
- IP grade 66: Dust and waterproof
- Specially designed microphone to meet environmental and IP requirements

Output from the noise sensor



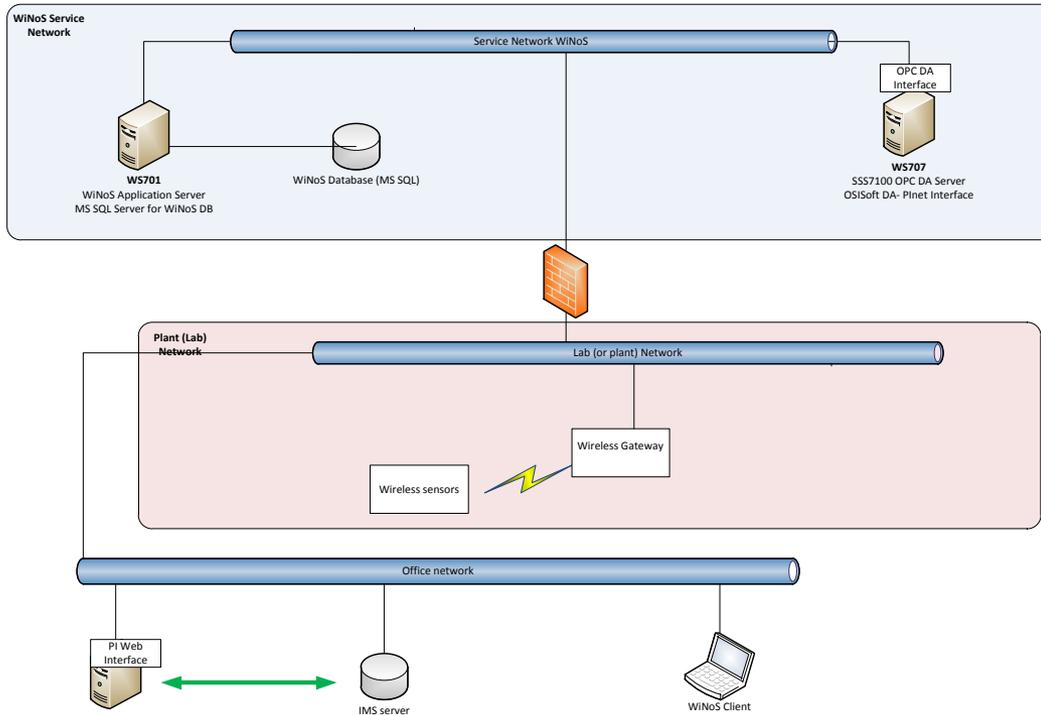
The noise mapping software



Basic concept

- Reference model
 - Pre-collected noise map
 - CAD drawings of area
 - Real-time data
 - Wireless noise sensors
 - S/W Calculation model
- **Dynamic Noise Map**

WiNoS system test March 2016



Where

- Industrial lab hall (35x25x15 m), Statoil Rotvoll, Trondheim

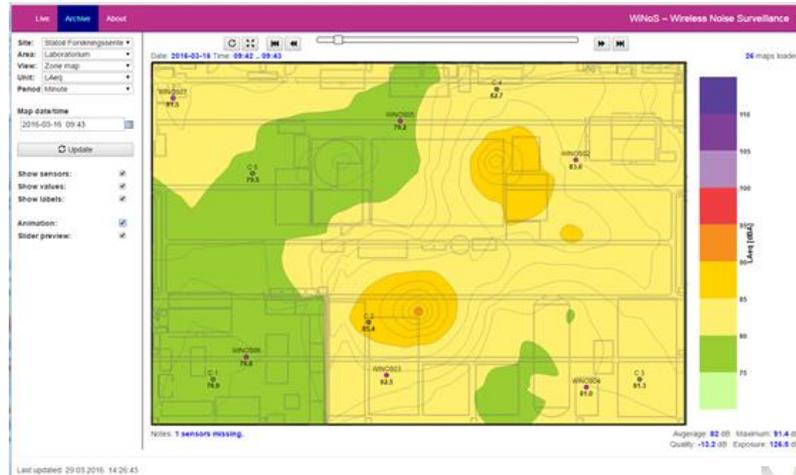
What

- Network of 7 ISA100 enabled wireless noise sensors
- Fully functional noise mapping S/W
- Synthesized noise sources (loudspeakers)
- Fully integrated IT backhaul architecture

WiNoS system test March 2016

Conclusions from the test

- End-to-end connection verified sensor – IMS – WiNoS application server
- Reliable values from wireless sensor
- Reliable and stable wireless sensor network (ISA100)
- Promising noise map quality (despite few sensors)
- Robust and scalable IT architecture



There's never been a better
time for **good ideas**

WiNoS –
Dynamiske støykart

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