

Remote supervision in NL

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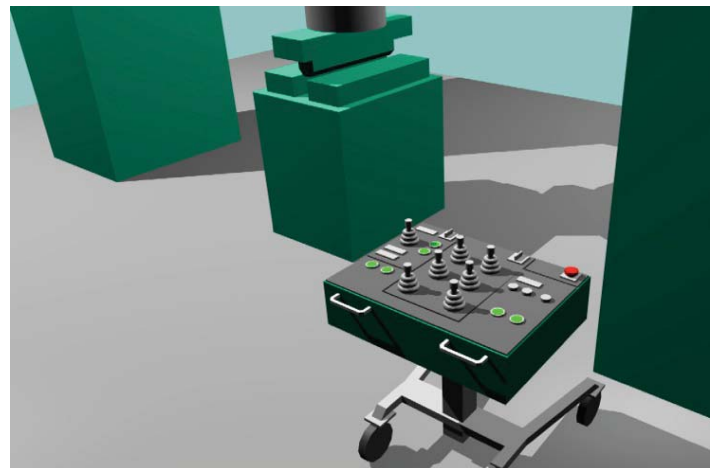
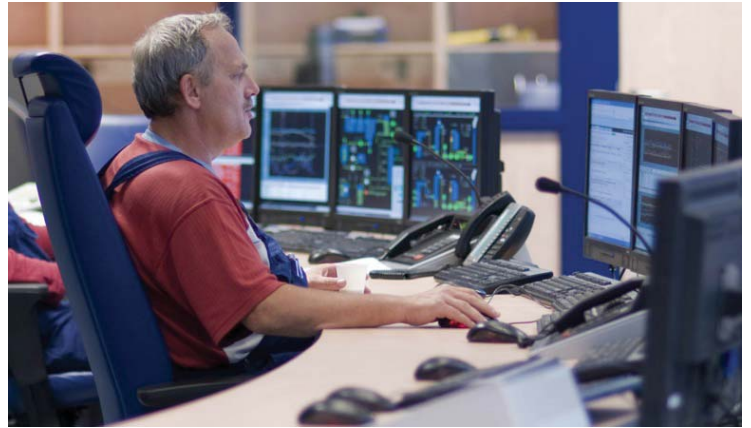
Remote supervision in NL

- Introduction
- Remote supervision examples – in variety of domains
- Case: onshore control of offshore gas assets
- Conclusions

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Introduction

- ErgoS Human Factors
- Last 10 years, many projects focus on *remote supervision*
- Domain transition:
 - Traffic control
 - Process industry
 - Power plants
 - Oil & gas
 - Ships
- New ! research project



Some remote supervision examples



Examples: bridges and locks

- the Netherlands: small country, much water
- more than 950 bridges can be opened
- many of them are now remotely operated
- operator distance sometimes > 75 km
- reduction of manpower: 1 operator for multiple bridges

Interesting HF aspects:

- time delay of IP based control.
- operators overestimate direct view quality
- CCTV image arrangement

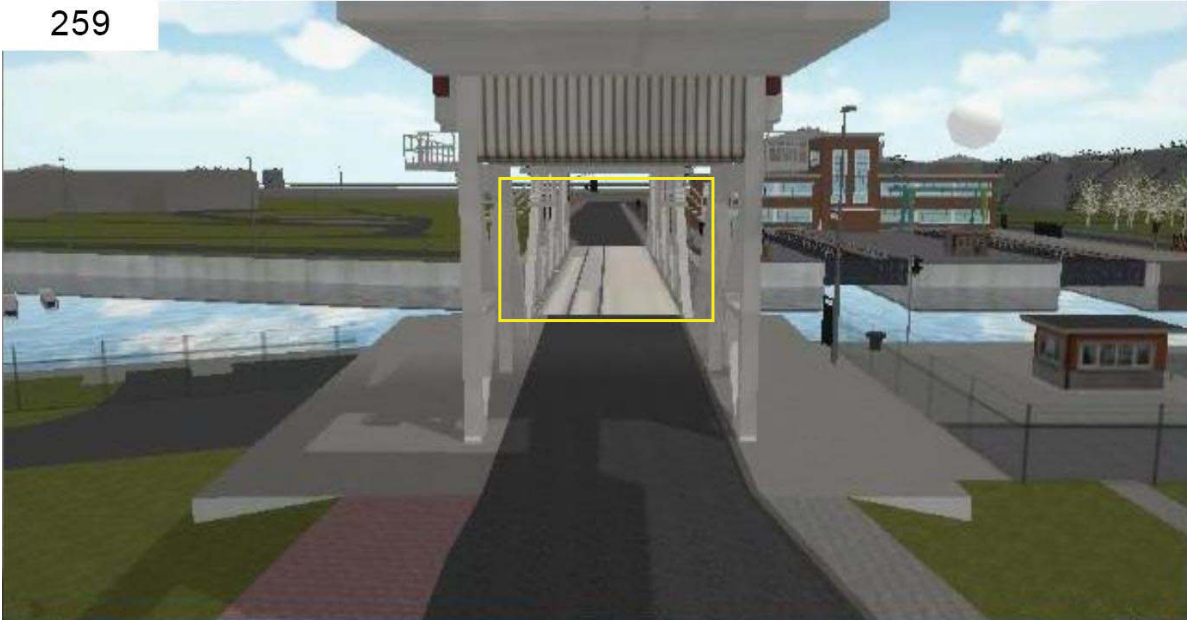


Examples: bridges and locks



Examples: bridges and locks

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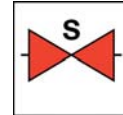
Examples: bridges and locks



Examples: power plants

Interesting HF aspects:

- 12 plants, one operator: realtime decision support
- *capacity control vs process control*
- integrating mutiple existing HCI standards ...



Examples: gas distribution

Hoofdgastransportnet



Examples: gas distribution

Interesting HF aspects:

- 8 operators: task allocation ?
- not by area but by function
- size does not matter: starting extra 25 MW compressor



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Examples: gas distribution

Simply press: +1

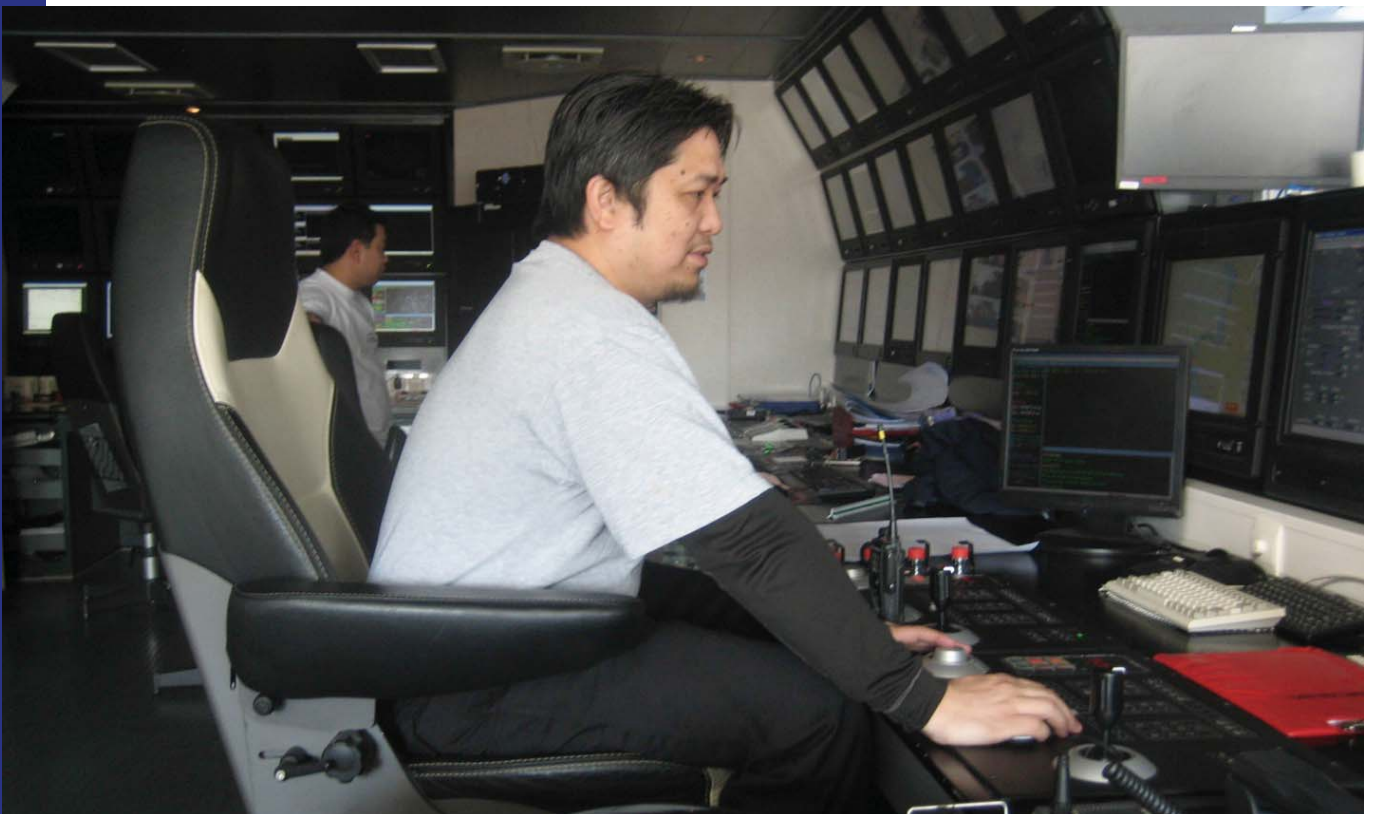


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Examples: ships



Examples: ships



Examples: ships

- Interesting HF aspects:
- Operator uses > 10 separate systems to control ROV
- Task allocation: 6 operators, but just 1 operator knows what is happening at seafloor level
- Decide *which* information to share and *how* to share

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Case: remote supervision of gas assets

- NL/UK part of the North sea:
 - GDF Suez
 - Total EP
 - Wintershall
 - NAM
 - Centrica
 - Vermillion
 - 15 other companies ...



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Case: remote supervision of gas assets

- 15 years ago Total EP switched to remote supervision
- 5 years ago Wintershall and GDF Suez followed



Case: remote supervision of gas assets

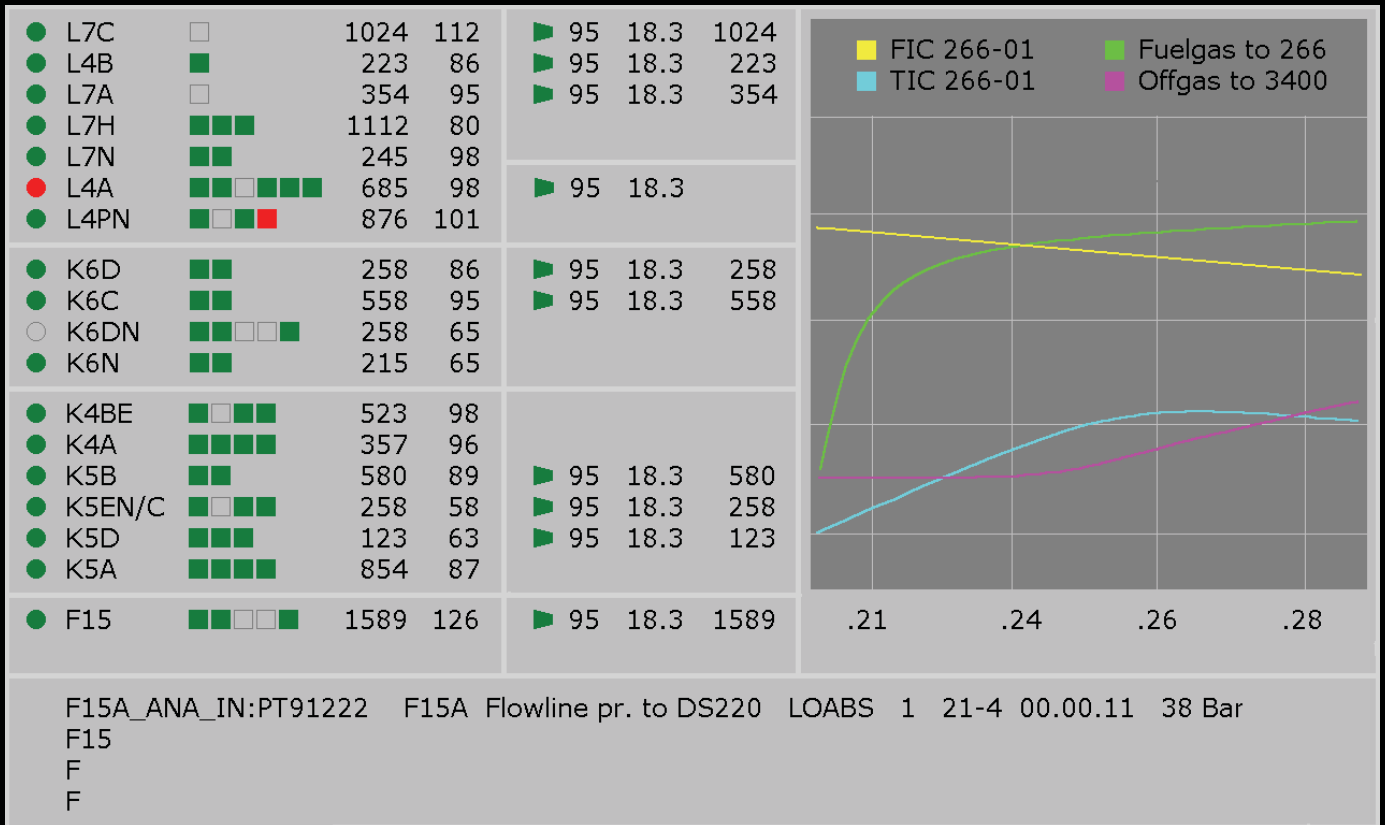
- Total EP: 18 gas assets
- 8 are (periodically) manned, rest are satellites
- step 1: *capacity control* moved to shore
 - control of production choke
 - start-up and closing in of wells
 - start-up and shutdown of compressors
 - communication with pipeline operators
- step 2: *process control* moved to shore
 - no permanently manned local control room
 - initially only during night shift, now 24h/day
- Big question is: how many onshore operators ?



Case: remote supervision of gas assets

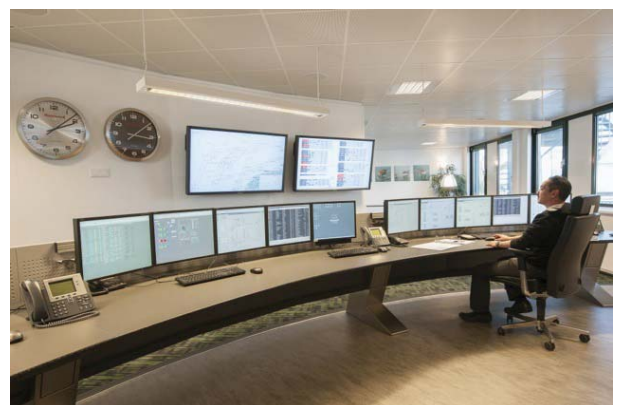
Just 2 ? how is that possible ?

- Workload per asset is relatively low. Offshore still requires a minimum of at least one operator per control room.
- Assets are independent, so non-normal situations usually restricted to one platform.
- Alarms are strongly related to maintenance: no local activity = reduction of alarms by 80% or more.
- Only process tasks are moved to shore: platform coordination, helicopter traffic, tests, inspection rounds, maintenance job preparation remain locally.
- New displays: permanent overview essential

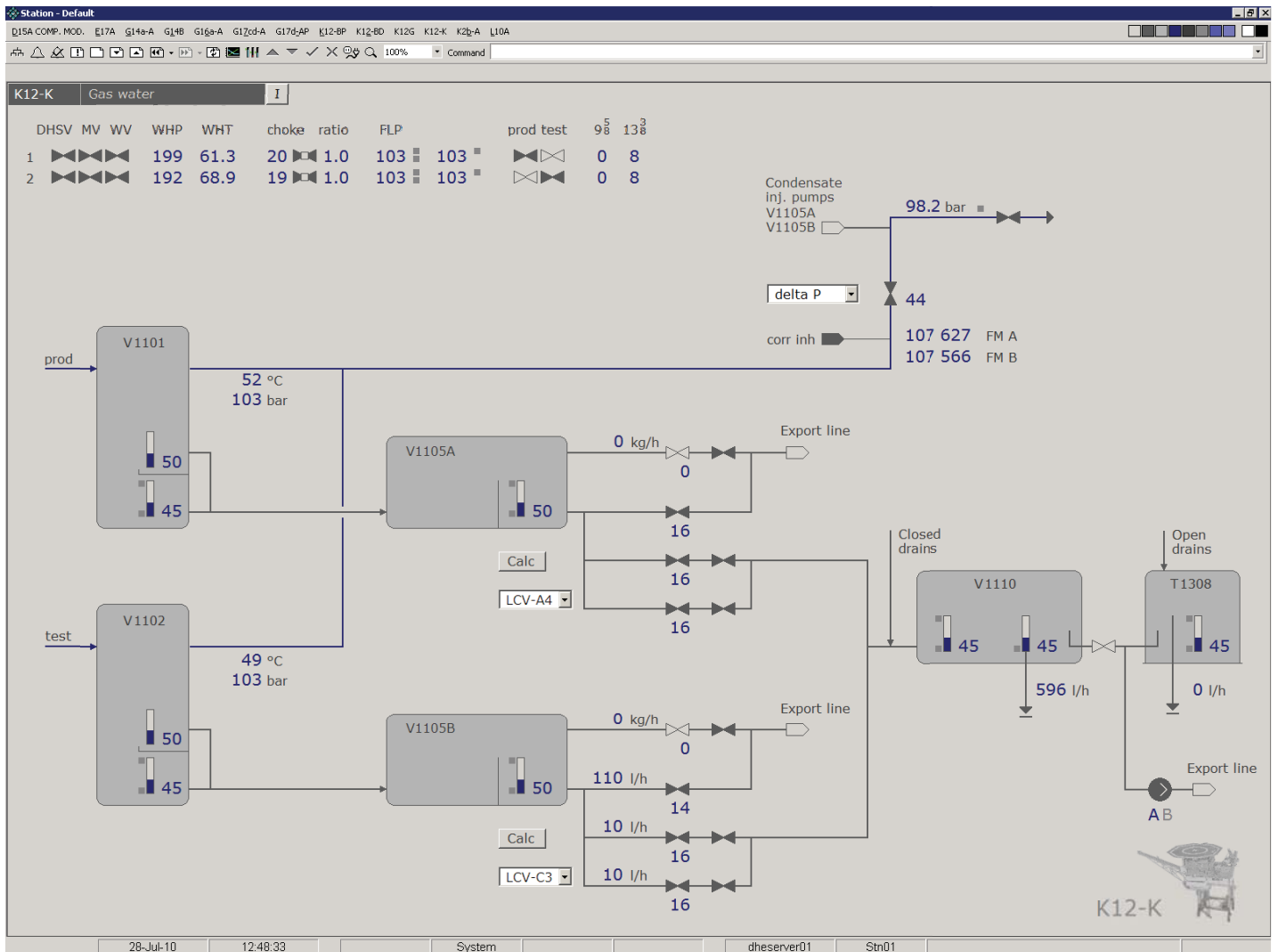


Case: remote supervision of gas assets

- Next project GDF Suez: 42 gas assets
- 18 are (periodically) manned, rest are satellites
- same approach: 3 onshore operators
- New challenge: many different process control systems, each platform 30 – 60 process displays > 1800







Case: remote supervision of gas assets

- Strong display reduction required
- Now: seven 'power graphics' per asset
- a set of power graphics covers 80-90% of all interaction
- one UserInterface standard

Conclusions

- Remote supervision is not new and no rocket science.
- Remote supervision is often just 'more remote'.
- Same principles seem to apply to multiple domains.
- Operator productivity is usually higher.
- Operator span-of-control can be larger too.

- Camera's not always required: using many camera's may initiate new problems and mixing-up risks.
- Mixing up risks also occur with multiple user interfaces
- SCADA systems and IP based transmission: relatively slow. Be careful with realtime control functions.

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Conclusions

- Remote supervision is the future of HFE !
- Attractive alternative to 100% automation.
Same benefits, but:
 - automation of the last 10% of human supervision is extremely difficult and expensive.
 - typical human control benefits remain, like creativity, anticipation, knowledge of contextual information, etc.
 - Operator skill and knowledge degradation is prevented.
 - Human is kept in the loop and still in control.

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Conclusions

ErgoS is starting-up a 75 day research project on remote supervision: you are welcome to participate !

- Focus on oil & gas assets
- Analysis of best practices & lessons learned
- Resulting in practical guideline document
- Funding: 10 participants = small investment
- Very relevant for Norway situation

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Thanks for your attention !

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