



Statoil

# Inspection of Water Injection Pipelines and Future Needs

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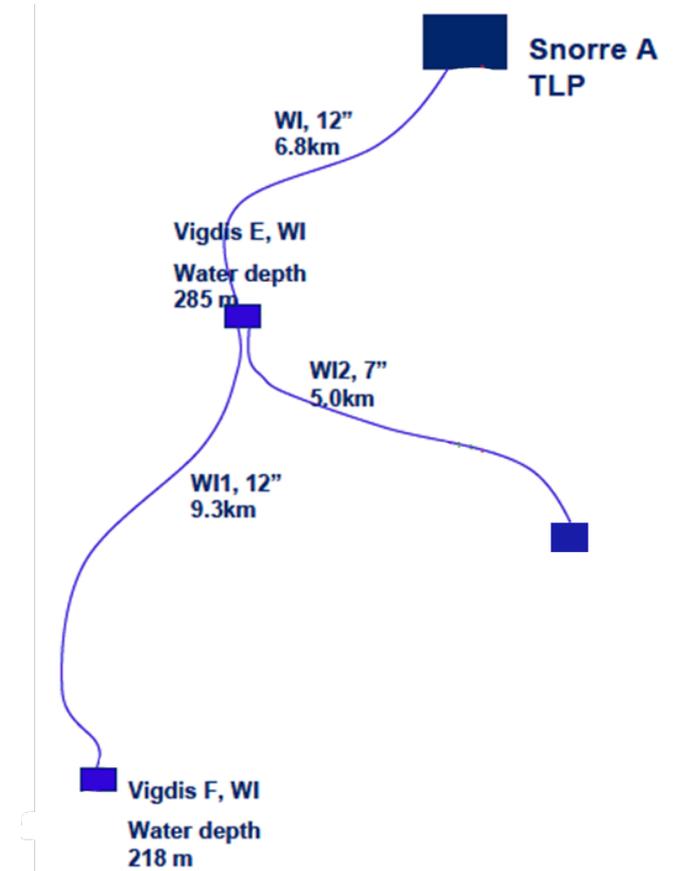
# Vigdis Water Injection

## Pipeline

- Flexibel rieser with carcass
- Soft bore
- Carbon steel pipe

## Observations

- Deposition on the pipe wall, scale
- River bottom corrosion



# Scale from the 2010 Pigging



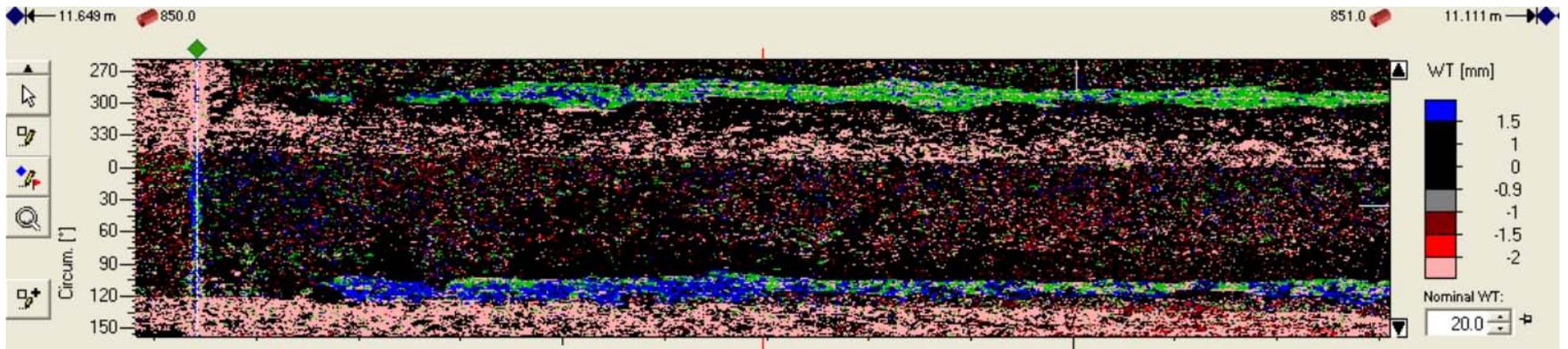
# Cleaning 2010



"Dust" cloud at the start, middle and end of cleaning program.

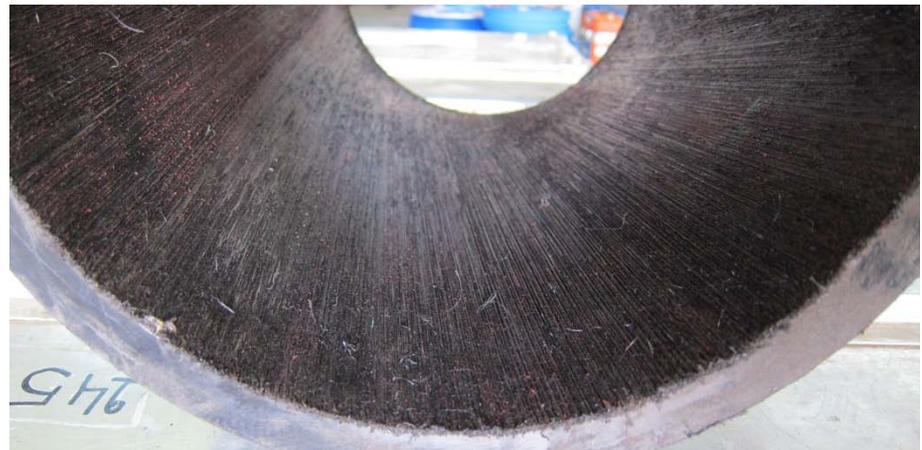


# Data 2010

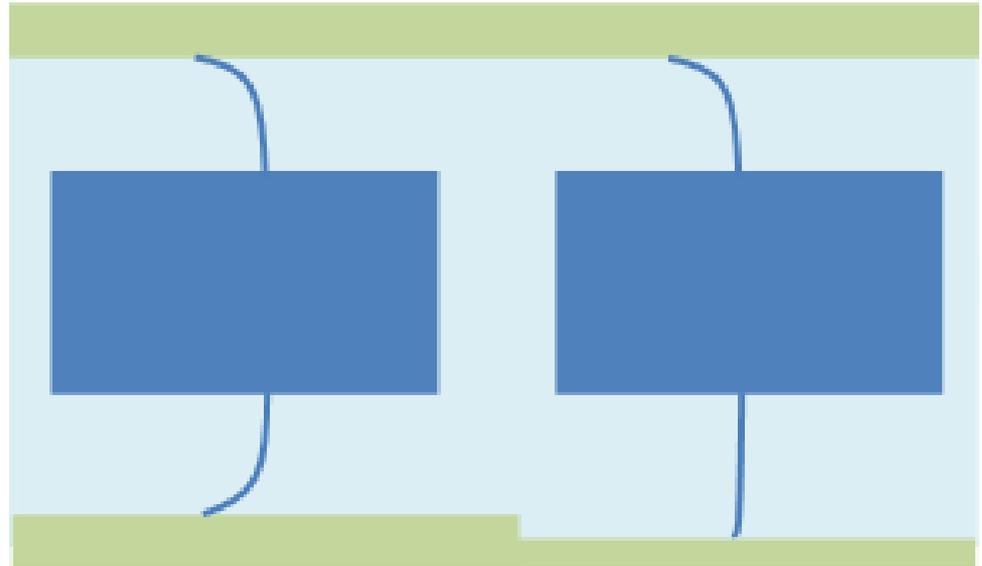
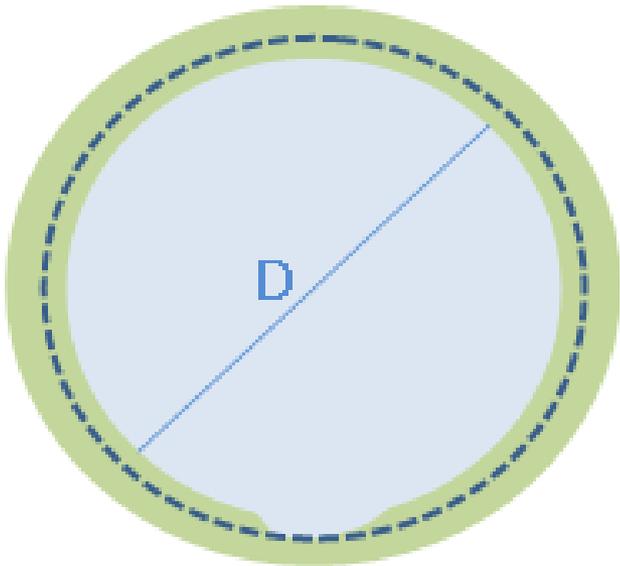


Clear indication of scale

# Test of Brushes in smooth bore PE 2011



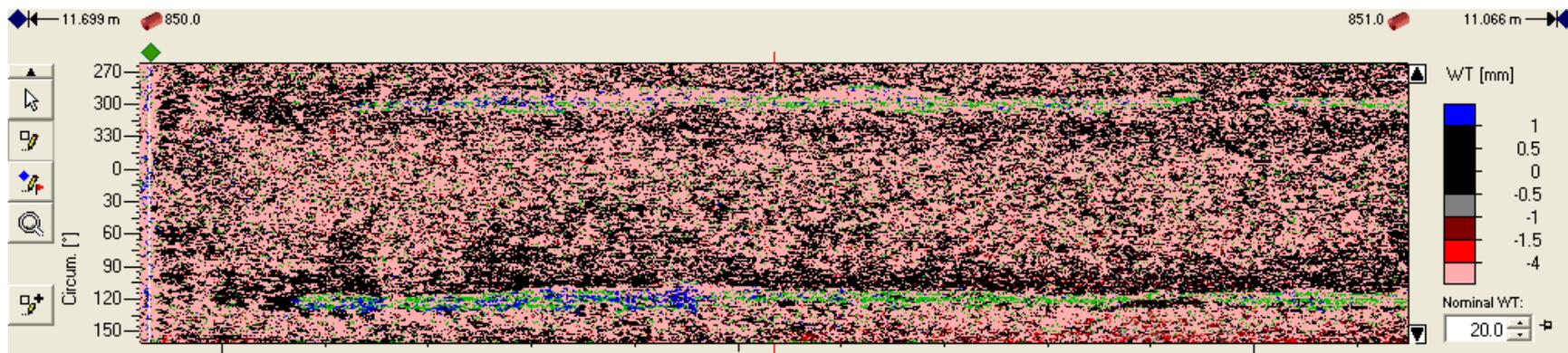
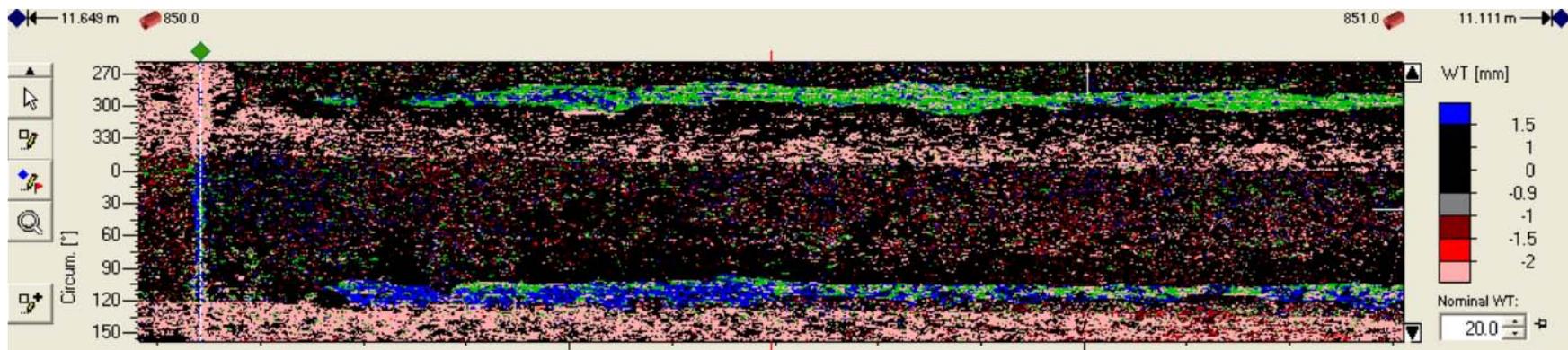
# River Bottom Cleaning 2011



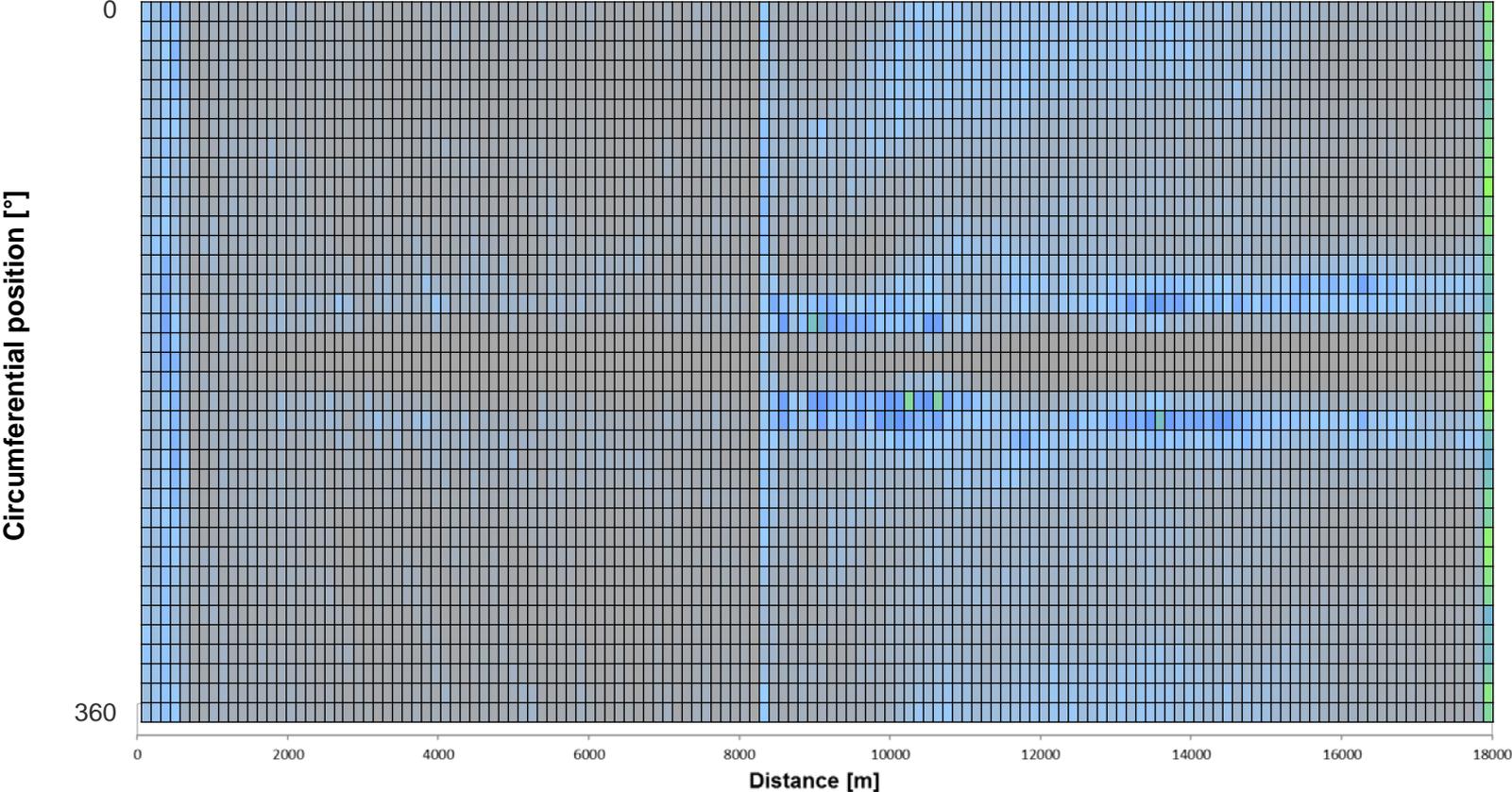
# Cleaning Tools 2011



# Data from 2010 and 2011



# WT Echo Loss Position vs Distance



# Tordis Oil Production

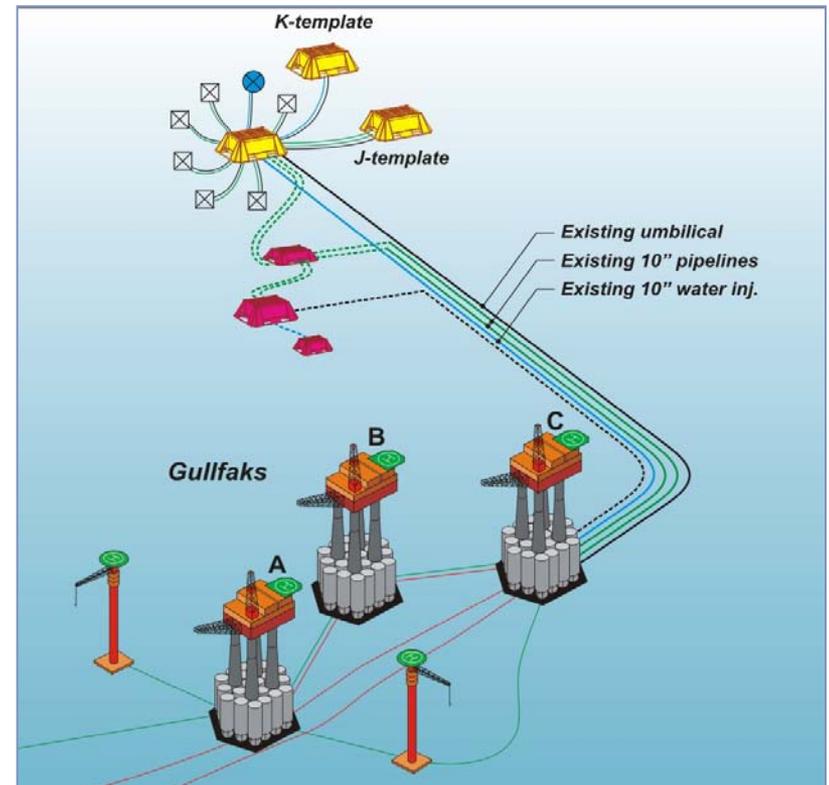
ILI 2010

Corrosion in both pipelines, channelling corrosion

Residual scale in the bottom of the pipe

Increased uncertainty in result due to scale

Decrease in calculated capacity



# Tordis Oil Production

ILI 2011

Improved cleaning of scale

No residual scale in the bottom of the pipe

Reestablished calculated capacity

# Future needs

- Cleaning of pipelines with hard deposits in combination with material of different wear resistance
- Efficient cleaning of multi diameter pipelines, large diameter changes
- Higher resolution inspection tools, e.g. high wall thickness in gas pipelines
- Inspection at low flow
- Wax rich pipeline has been mentioned before and is still a challenge, both when it comes to proper cleaning prior to inspection and to keep the sensors free of wax
- Semi intelligent cleaning pig, when is the pipe clean enough?
- Unfiltered inspection data on standard format available for the operators
- High temperature

# Conclusions

- Challenge to remove scale
- Accelerating scale build-up
- Interesting tool development to look forward to

A photograph of an offshore oil platform at night. The platform is illuminated with warm lights, and a tall flare stack is visible on the left. The sky is a deep blue, and the ocean is dark. The platform's complex structure of pipes and steel is clearly visible.

Thank you

# Inspection of water injection pipelines and future needs

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