Introducing Automation for Well Intervention Operations on NCS

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Agenda

Overview
- Well intervention operations
- The path towards automation

Why Automation?
- Goals and status
- Experience from the field

Safety
- Automated safety
- Human operator role
Well Intervention

Any operation carried out in a well during its lifetime that alters the production or provides well diagnostics.
Why Automation?

Accidents per million km

- Tesla - Autopilot: 1.43
- Tesla: 0.40
- Other: 0.14

[Graph showing comparison of accident rates between Tesla Autopilot, Tesla, and other vehicles.]
The Alliance will be a global benchmark for outstanding offshore well intervention and stimulation operations.
What are we doing?

- Wheel, chassis, seats, etc.
- Sensor Data Control Systems
- Maps in the cloud
- Autopilot
- Adaptive Cruise Control
- Lane assist
- Autonomous driving experience
What are we doing?

Wheel, chassis, seats, etc. → Sensors → Autopilot
Existing intervention equipment and technology → Control Systems → Adaptive Cruise Control
Automatically → Lane assist
Autonomous driving experience → Plan and Execute Automatically
Automation Goals

State objective

Plan and execute steps automatically
Where are we today?

- Oct’21: First offshore trial with slickline
- Dec’21: Field introduction for wireline and slickline
- Today: Automation executed continuously in operations
- Dec’22: Field introduction for coiled tubing operations

8 Wells 27 Runs

- Well 0: 7 runs
- Well 1: 8 runs
- Well 2: 2 runs
- Well 3: 3 runs
- Well 4: 2 runs
- Well 5: 2 runs
- Well 6: 3 runs
- Well 7: 1 run

Runs per well chart
Automation Experience

- Increased use of Automation
- Execution consistency
- Automation system equal experienced operators

Average Speed per Run, m/min

- **Well A RIH** 2 runs
- **Well A POOH** 2 runs
- **Well B RIH** 4 runs
- **Well B POOH** 4 runs
Automated Safety

- Real-time modelling and monitoring of anomalies

Automated safety measures prevents undesired and unsafe situations
Safety—Human Operator Role

- Automation ↔ Manual control
- Automation confirmation required

Operator presence – Monitor operation

Automation input verification prior to execution

Recover manual control anytime
Conclusion

- Wireline and slickline automation a reality in NCS
  First in the world offshore

- Next step is coiled tubing automation
  First in the world