What is DrillTronics?

/ DrillTronics is
- An extension of the Drilling Control System (DCS) to ASSIST the Driller
- Providing safety envelopes, safety triggers and automated functions

/ It is not
- It is not a control system (in the sense of controlling one or several parameters)

Driller can decide to override at any time
Sensor data

Mathematical models

Limits & calculated data

DrillTronics®
Real-time Safeguarding

DrillTronics
- Automatic pump start/stop
- Automatic friction test
- Automatic reciprocation
- Pack-off prevention
- Protection while tripping and reaming
Statfjord C - Automatic friction test
Statfjord C - Manual friction tests
High SPP
Emergency Flowrate
Pack off removed
Safe Flowrate

Pressure control / AUTOMATIC PACK-OFF PREVENTION
Feedback loop protects wellbore and ensures well objective is achieved.

Pack-off prevention function protects wellbore.

DrillTronics detects pack-off 7 minutes before driller reacted and took action.

Driller shuts down mud pump.
Statfjord C – October 2014

/ First well
- Several examples of increased efficiency, consistency in operations
- Safeguarded well against human mistakes

/ Drillers especially liked the automated functions and the ability to measure consistency and improvement in connection time and tripping speeds
Statfjord C – July 2016

Longest lateral well ever drilled on Statfjord C, 8400m, 12 1/4” section
Learnings after seven wells

TECHNICAL

/ Excessive testing prior to use – certified in well simulator
/ Changes and upgrades to systems are limited after installation
/ New concept challenging old systems – processes and procedures
/ Lack of standard for updating & reporting data changes

OPERATIONAL

/ The importance of training
/ Focus from equipment failure to examining wellbore condition
/ Awareness throughout the drilling organization creates good communication
/ Expectations need to be set with all parties – communication
/ Align processes to avoid imposing too many changes in the operation and in the team
Statfjord C – DrillTronics on all wells

// All teams performs equally as good as the best driller
// Consistently amongst Statoil top performers
MAKES AUTOMATIC DRILLING POSSIBLE