

# Downhole Simulator



**The Downhole Simulator (DHS) gives your crew practical experience in a safe environment. Combined with our topside simulators, the DHS provides optimal capabilities for safe and high performance drilling.**

With feedback from a virtual well, our DHS can be used to train the drill crew to understand and interpret the signals from the well in a safe environment. This helps the crew make correct decisions and actions. The DHS consists of a fluid and mechanical software model that can be configured to represent a real well.

The DHS includes the following configurable parameters:

- Wellbore trajectory
- Tubular and open hole specification
- Geology
- Fluid

Different training scenarios can be set up and initiated by the instructor. The instructor can set triggers to enable the student to mitigate specific scenarios.

## DHS Functionalities

The following operational scenarios can be simulated:

- Well Control
  - Taking a kick while drilling/tripping
- Pack off
  - While tripping in hole
  - While pumping out of the hole
  - While back reaming

- Hole cleaning
  - Poor hole cleaning while drilling
  - Consequence while tripping out (POOH)
  - Consequence while tripping in (RIH)
  - Drag if drilling is stopped
- Tripping difficulties
  - Ledges
  - Key seating
  - Tight spot
- Jarring
- Drill string malfunction
  - Plugged bit
  - Washed out bit nozzle(s)
  - Washed out drill string

The instructor can adjust values to initiate custom scenarios. The operational feedback is displayed in the DrillView™ system.

Additionally, the responses from the above scenarios can be sent to the Automated Drilling Control (ADC) to observe reaction from the automation software, e. g. pack-off protection, surge/swab protection, tight-spot protection, etc.

## Benefits

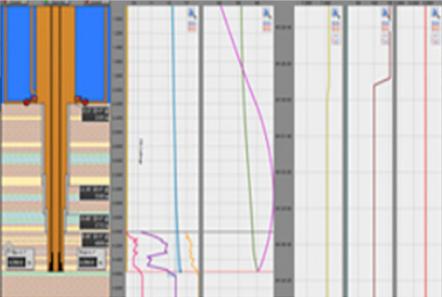
- The MHWirth technology can be utilized on both well and rig specific condition
- Reduces risk by enabling the crew to train on drilling scenarios that do not happen frequently
- Improves drilling performance by enabling the crew to become familiar with a well prior to drilling
- Trains the crew to take preventative actions
- Trains the crew to reduce impact of an incident should it occur
- Enables testing and the calibration of smart modules and drilling automation control in a simulator environment before installation on the rig
- Combining DHS and performance analyzer in the simulator reduces invisible lost time (ILT) and increases drilling efficiency on the rig



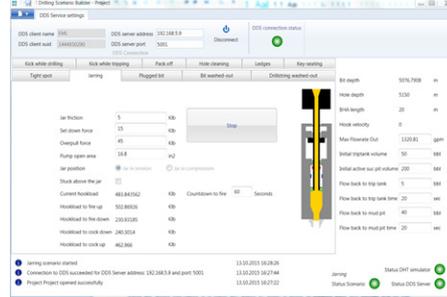
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## Technical Feature

**Downhole Simulator (DHS)**  
Simulation of well



**Instructor Station (DSB)**  
Building of drilling problem scenarios



**Drilling Crew in Simulator Environment**



Data Communication

## Our Simulator Training Concepts

Safe and efficient drilling operations are based on the knowledge and skills of the individuals as well as the team. As part of our training and performance optimization offering, we provide simulator training for both downhole and topside operations.

Together with your downhole expert, our experienced topside instructor will execute the downhole training as per your operational routines. Additionally, the crews can be trained on scenarios expected in upcoming operations. The simulator can be set up to meet specific requirements the drill crews will need to handle daily operations.

We base our training on a solid pedagogical foundation to ensure that all participants, regardless of learning styles or experience, can achieve the best possible skillset and knowledge.

### MHWirth's Drilling Lifecycle Services

With a global footprint and a strong focus on the Total Cost of Ownership our Drilling Lifecycle Services are here to support you throughout the lifetime of your operation.