
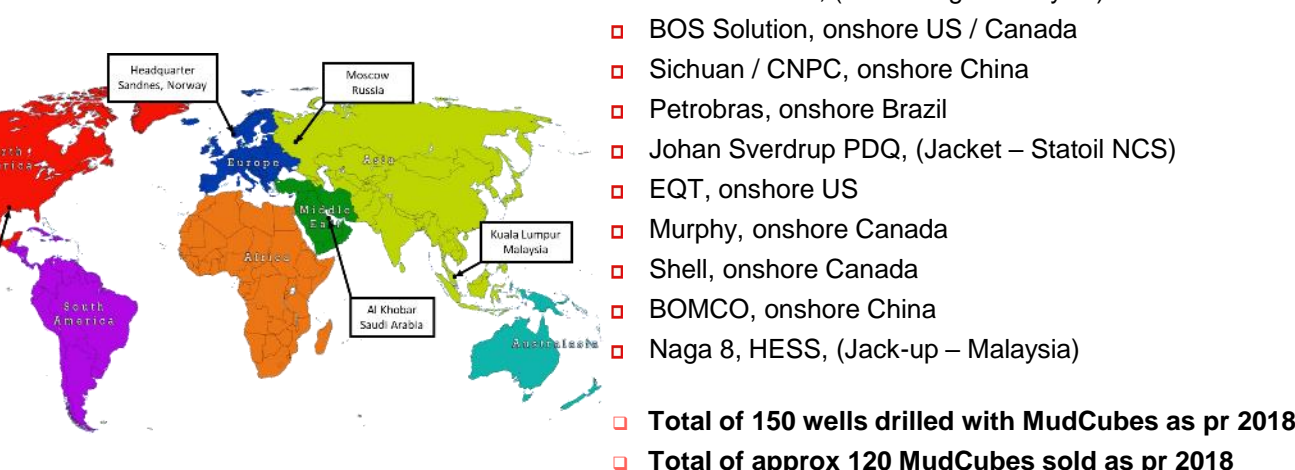


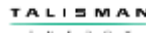


MudCube: A modern, safer and lower cost solution for primary solids control

History since Giant 2012.....



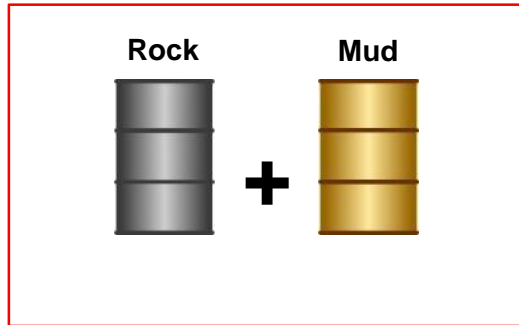
Cubility in brief	The MudCube	Projects as per Jan 2018
<ul style="list-style-type: none"> ❑ Founded in 2005 in Sandnes, Norway ❑ Developed and introduced the MudCube, a step-change technology for solids control and mud treatment ❑ Statoil a key technology development partner ❑ First commercial MudCube sale in 2012 ❑ Global uptake of MudCube technology from a number of international & national customers ❑ Owned by Triton funds 		<ul style="list-style-type: none"> ❑ Maersk Giant (Jack-up - NCS) ❑ Askepott, Statoil (Jack-up - NCS) ❑ Askeladden, Statoil (Jack-up - NCS) ❑ Chevron, onshore US ❑ Maersk Gallant (Jack-up - NCS) ❑ Scarabeo 5 (Semi-sub – NCS) ❑ Statoil Peregrino A (Jacket - Brazil) ❑ Noble Lloyd Noble (Jack-up – UK) ❑ Mariner Jacket PDQ, Statoil - UK ❑ Saudi Aramco, Sino 7 - onshore ❑ Maersk Resolve (Jack-up – UK) ❑ Shell Sarawak, (Tender rig – Malaysia) ❑ BOS Solution, onshore US / Canada ❑ Sichuan / CNPC, onshore China ❑ Petrobras, onshore Brazil ❑ Johan Sverdrup PDQ, (Jacket – Statoil NCS) ❑ EQT, onshore US ❑ Murphy, onshore Canada ❑ Shell, onshore Canada ❑ BOMCO, onshore China ❑ Naga 8, HESS, (Jack-up – Malaysia)
Operational and HSE benefits	Cubility footprint and service capabilities	
<ul style="list-style-type: none"> ❑ Reduced drilling waste volumes ❑ Reduced consumption of drilling fluid ❑ Improved drilling efficiency ❑ Improved ECD performance ❑ Greatly reduced oil vapor & oil mist ❑ Reduced filter-cost ❑ Reduced noise levels ❑ Eliminated vibration ❑ Reduced loading on deck 	 <ul style="list-style-type: none"> ❑ Total of 150 wells drilled with MudCubes as pr 2018 ❑ Total of approx 120 MudCubes sold as pr 2018 	



Traditional solids control equipment



High Mud Losses



At least 1 bbl of mud lost for every 1 bbl of rock drilled



Wet cuttings as waste

HSE Exposure



Mud mist



Noise & Vibration

Labour Intensive

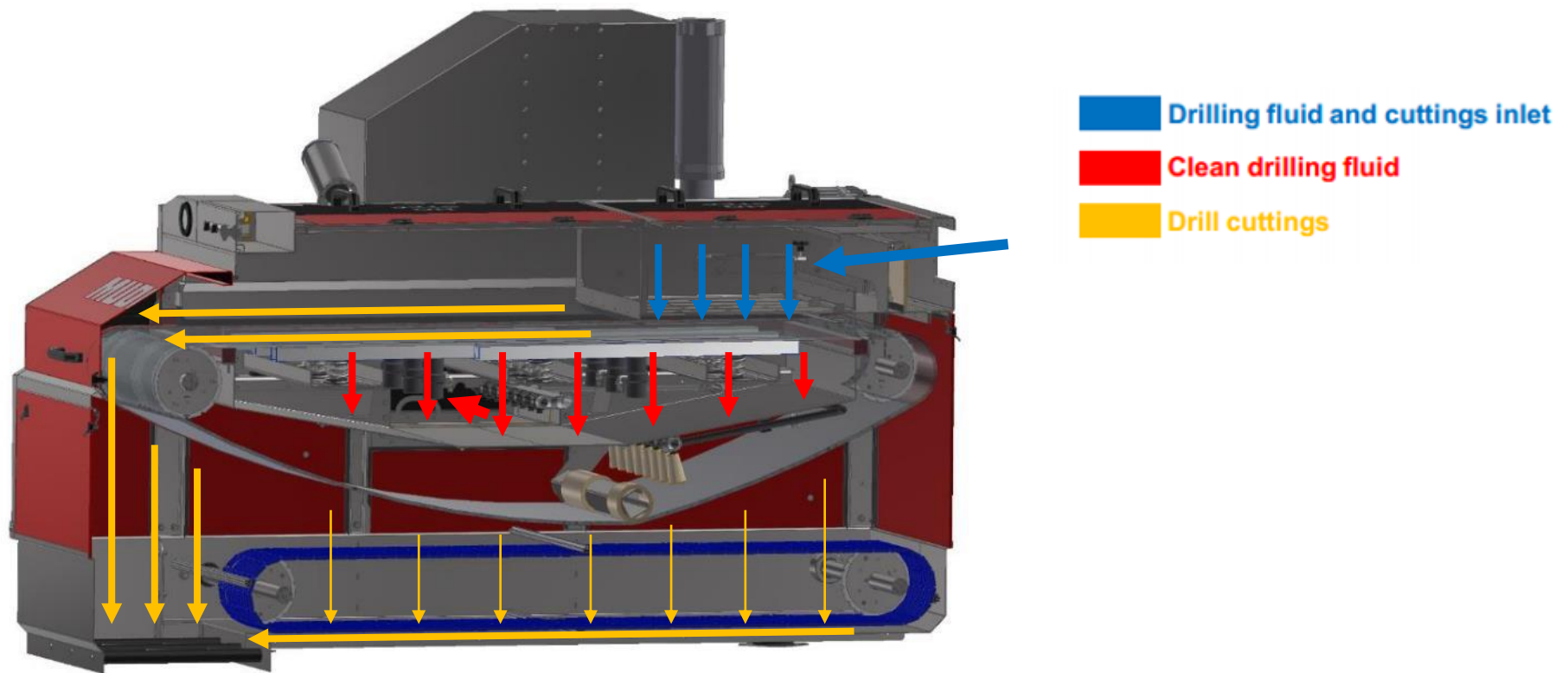


Washing plugged screens



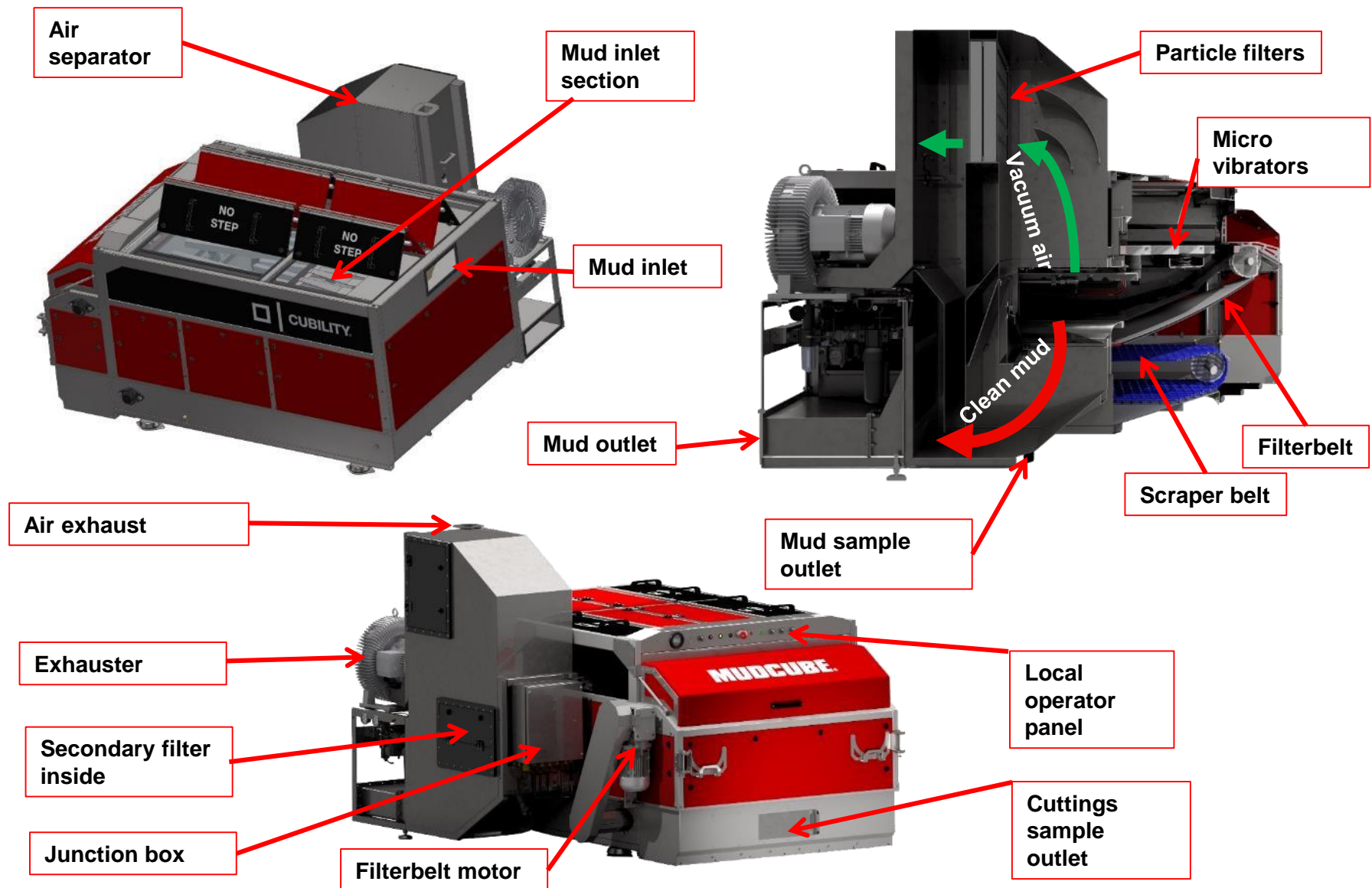
Up to 24 screen panels

The MudCube – Main Process Flows



The MudCube uses a combination of high air flow pulled through a rotating screen (filter belt) in combination with micro vibration to filter-belt in order separate drill cuttings from drilling fluid. The fully enclosed MudCube incorporates its own ventilation system, significantly improving HSE in the solids control area.

MudCube – Operational details



MudCube reduces exposure to vapour & gases



Feedback from Maersk Giant roughneck



Harmful vapor/mist extracted



Working environment

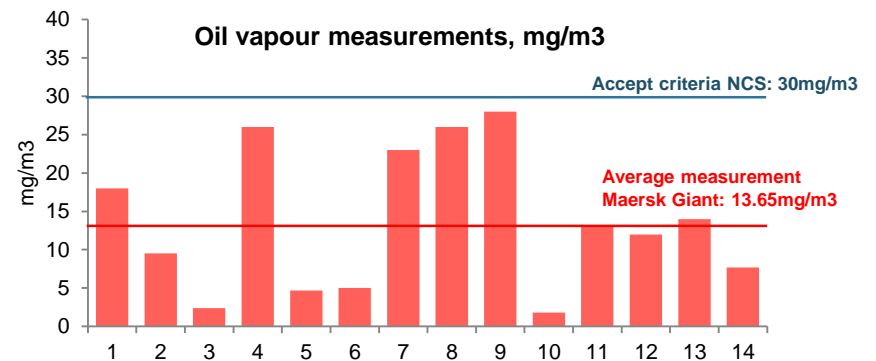
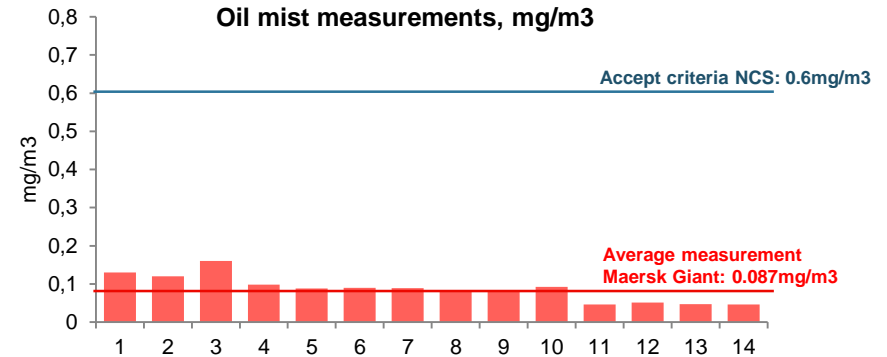


Shaker room on Maersk Giant*

- ❑ Vapor and oil mist are eliminated in the shaker room due to the enclosed system and airflow through the MudCube
- ❑ The noise from the MudCube system is significantly lower than from the previous conventional shaker system
 - ❑ Noise level tested to maximum 74 dBA in the upper shaker house by Lloyd's Register ODS
 - ❑ No restriction on maximum working time or required hearing protection
- ❑ The structural vibration from previous system is eliminated
- ❑ The MudCube system is the only solids control system which today meets the given regulations with regards to the working environment on the NCS
- ❑ *"I went to get a coffee and brought it back to the MudCube lounge because this is the nicest place to be" - Roughneck*



Measurement of oil mist and vapours during operations

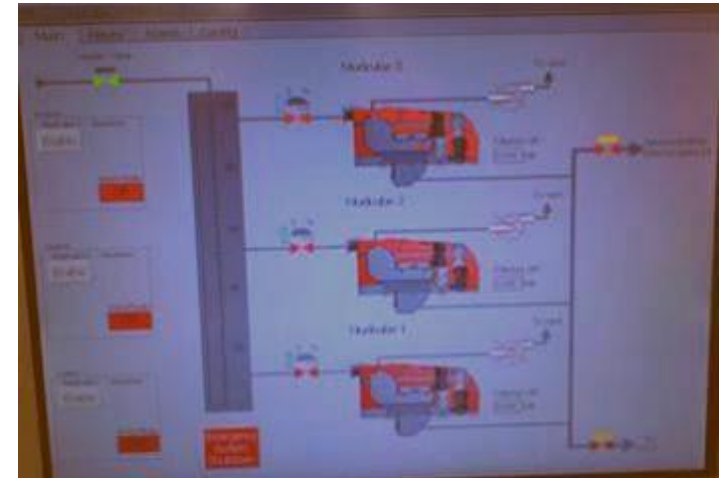
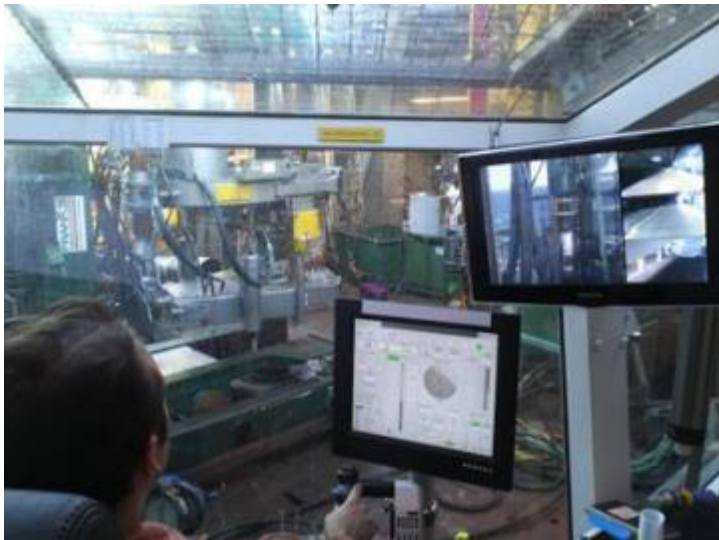


Tester:	Intertek
Date:	5-6th Jan 13
Flowrate:	3 500 ltr/min
Mud:	Versatec OBM
Flow-line temp:	60 deg. C
Locations:	14 samples from the shaker room

Remote operation and automation

Automation

- ❑ The MudCube can be controlled and operated remotely due to camera, sensors and control system
- ❑ Cameras installed inside the MudCube, allowing for visual monitoring process without moving away from control room
- ❑ Operator panel connected via Ethernet to PLC for visualizing and controlling / monitoring of the process



MudCube allows for remote operation

KCAD MudCube Operations



- ❑ Installed on Askeladden and Askepott



- ❑ Challenging drilling - new operations
- ❑ Good learning curve for all parties moving towards more and more effective operation
- ❑ Continue operational improvement

Cubility/KCAD initiatives:

- ❑ Improved MudCube operational performance
- ❑ Reduce service points
- ❑ Operational excellence



Askepott – user experience



Control room

Askepott – user experience



MudCube on Askepott

Askepott – user experience



Exhaust from MudCube/Shaker room

Askepott – user experience



Mud sampling point



Cleaning of filterbelts (air nozzle and flushing)



Thank you!
