

gen. BRI Cleanup is the only company offering dynamic hydrocyclones today under the brand of Dynamic Desander System™, see Figure 2.

The advantages of Dynamic Desander technology over conventional hydrocyclones include:

Two-stage separation in one vessel (hydrocyclonic separation is enhanced with centrifugal action of the impeller), which guarantees superior performance independently of the flow.

No need for inlet nozzles and liners, which significantly improves HSE aspects as well as leading to better operational characteristics.

No pressure drop (and in fact an increase in pressure as illustrated in Figure 3).

Dynamic Desander System units are highly automated and provide real-time data on the weight of separated solids and other process parameters. They are fully integratable into platform systems. Each unit consists of upper separation vessel and lower accumulator vessel. The sand, separated in the upper vessel, sinks into the lower vessel, which can be discharged to a recipient of choice (e.g. sand skip or rig's cutting reinjection system).

The separation process is continuous and does not stop even during the sand discharge sequence, which only takes a few minutes. Another unique characteristic of DDS™ is its ability to clean the sand while it is separated and discharged. No additional cleaning equipment is normally required, which simplifies the disposal of the sand if brought to shore. In some parts of the world, where it is permitted to discharge the sand overboard, the sand even meets the strict authority cleanliness standard without the need of additional treatment.

When a conventional hydrocyclone is utilized, there is often a need to install subsequent filter unit to remove the smallest particles (Arefjord and Malinauskaitė; 2017). This auxiliary equipment is most often not required when DDS™ is employed and removal of particles with sizes down to 5 microns have been recorded.

Deployment of the Dynamic Desander System™ on an offshore platform in Malaysia led to doubling of production for some of the connected wells. In Norway, the system is often in use on well interventions and flow-back operations. Integrated into a coiled tubing (CT) package, the DDS™ gives coiled tubing operators real-time information about the amount of solids coming from the well. It also prevents any solids in the returns from entering coiled tubing fluid circulation or platform processing systems. Recently, dynamic hydrocyclones made an appearance on the US market, where efficient dealing with the return of solids has been an unresolved issue for unconventional fracking operations. A unique capability of the DDS™ is to handle variations in flow and large amounts of gas, while simultaneously maintaining high separation



Figure 4. BRI Cleanup Dynamic Desander unit in unconventional fracking operation in USA.

efficiency due to dual separation action proved to be detrimental for its success. Based on the proven track record of the DDS™ technology, its compact size and the potential for automated continuous operation, it could be suggested that there finally is a permanent solution to the topside solids issue. Benefits described by Statoil engineers back in 2005 can finally be realized.

References

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WELL CLEAN OUT AFTER REPERFORATION 98% SEPARATION EFFICIENCY

Shell Gannet, North Sea

Solution

There was a high expectation of sand during the initial cleanup, therefore the use of the FourPhase DualFlow solids removal system was chosen for the collection of any sand produced to surface assuring high separation efficiency and minimal space requirements due to system's compact design. The FourPhase system continuously separated and removed solids which were then flushed to external skips on the hatch deck. The cleaned return fluids were routed to an unused wellhead to allow access back into the production stream.

Result

- No recorded HSE incidents.
- No recorded equipment downtime
- 912 kg of solids separated during the cleanout operation.

Challenge

Two wells were planned for cleanup flow after reperforation using wireline intervention. The aim of performing the cleanup was to enhance production from the wells post reperforating. Once the FourPhase solids removal system was mobilized, the scope of the operation was expanded by two additional wells.

Successful reperforation operation met clients' expectations and resulted in FourPhase solids removal system being requested for upcoming operations.

*Text provided by Giedre Malinauskaitė
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Operational considerations:

- High expectation of sand during the initial cleanup

