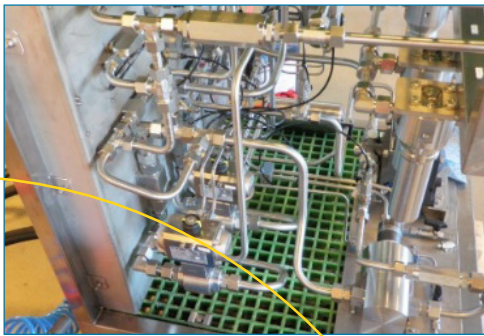


CASE STUDY

MERA HPFS® - Increased Drilling & Production Performance



Background & Requirement

Keeping hydraulic fluid clean has always been a major concern for rig operators worldwide. It has been shown several times how fluid particle contamination can drop life expectancy on seals, gaskets, wear bands and cylinders. Experience has shown that keeping the hydraulic fluid up to spec is hard to obtain and in many situations today the equipment must be shut down in order to perform a full particle filtration of the hydraulic fluid. This is not only time consuming, but also dramatically reduces the number of operating days, with subsequent loss of profit.

Technology Development

MERAAS started an R&D process in 2009, focusing on development of a technology to make it possible to circulate pressurised fluids without causing any integrity breach for the main system. The primary assets targeted for this technology were Riser Tensioning & Motion Compensating Systems used on offshore drilling units. Solving this challenge meant that fluids used in hydro-pneumatic systems could be circulated and maintained whilst in operation. Significantly reducing maintenance cost on large and critical components/systems.

Studies of various OEM designs incubated and materialized the HPFS®, high-pressure filtration system, technology. Later versions includes FFU, manufactured for National Oilwell Varco (ref PIB 81745999).

The 3-year, 15 Mnok, development phase lead to the invention of the key components needed to perform, safe and reliable technology integration into systems with strict class society notations, possible. Field-testing was performed during a 12-month period 2012-2013, onboard the Odfjell Drilling MODU Deepsea Atlantic, in cooperation with NOV. A single line HPFS was then tied-in to an operational N-Line cylinder/accumulator, pressurised and commissioned. After 3 months of optimising the pump design, the system ran 24/7 without any operational downtime.

This test period proved the reliability of the technology, and verified low life cycle costs on the system itself.

In-depth studies of laboratory fluid analysis and filter elements inspections were performed and the results were conclusive...

At a glance...

Customers

NOV, Odfjell Drilling, Seadrill, Stena Drilling

Location

North Sea

Customer Requirement

Keep pressurised hydraulic fluid clean and circulating in hydro-pneumatic systems whilst in operation without the need to shutdown the system.

Technology

HPFS/FFU® developed by MERA provides a patented method for circulation of pressurised fluids making it possible to continuously maintain these fluids inoperational hydro-pneumatic systems - in particular riser tensioning and motion compensating systems.

Benefits

- Reduced maintenance costs
- Significantly increased operational stability

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Results

Comparing laboratory reports, before and after, confirmed that the amount of contaminants in the fluid was substantially reduced. This reduction relates to two primary factors:

- The total system fluid volume passed fine mesh composite filters, at a rate of up to three passes per 24 hours. Filtering already existing contaminants, both solids and organic, made fluid quality condition meet specified requirements.
- A de-catalytic effect was achieved by meeting fluid cleanliness specifications. Meaning that the rate of wear on seals and other dynamic components was reduced.

Equally important was the integrity results, proving that system integration did not require any revised assessment to main system classification.

Conclusion

To date, several complete sub-systems have been successfully installed enabling rig owners to maintain critical assets while running operations as normal - increasing drilling performance and reducing costs.

"This technology reduced our direct costs related to operational performance, maintenance, spare parts, un-renewables & personnel... Senior Subsea Engineer Odfjell Drilling"

Integration can be performed both on new-builds and as retro-fit. Compatible with all riser tensioning and motion compensation OEM designs.

MERA AS regards this Patented and field-proven technology to be the recognised industry standard. Supported by amongst OEM clients and major offshore Drilling companies as references.

