

## CASE: Turbulent Conventional Oil Flushing with Induced Waves of Hydraulic Top Drive

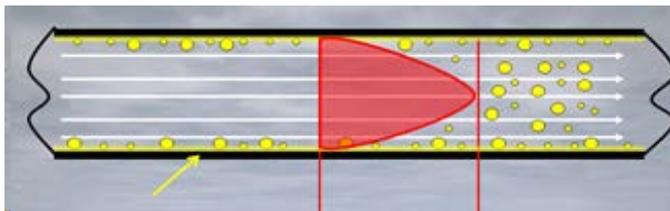
**Conventional oil flushing using turbulent flow is the most reliable method for cleaning of hydraulic systems, including hydraulic top-drive systems. Ocean Team has refined this technology by adding induced waves and thereby making the process faster and more effective.**

Hydraulic systems are very diverse, both in size and complexity. However, thanks to many years of experience, Ocean Team has designed and developed a wide programme of flushing technologies, methods and units capable of meeting the ever-increasing requirements on cleanliness in the energy sector world wide.

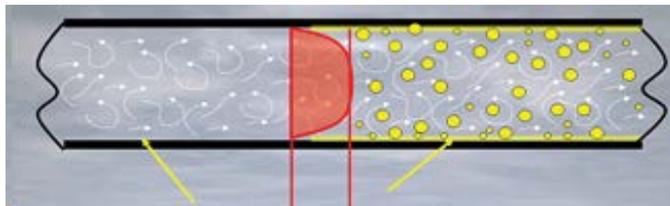
### Turbulent Conventional Oil Flushing

Ocean Team has developed methods for conventional oil flushing using turbulent flow rather than commonly used 'laminar' flow.

Flushing with turbulent flow efficiently dislodges impurities deposited on the inside of the pipe system. In comparison, flushing using simple laminar flow will clean the oil, but not the pipe system and it will only be a matter of time, before the oil becomes contaminated again.



**Figure 1** – Laminar flow leaves back a lay of particles over 0,01 mm.



**Figure 2** – Turbulent flow leaves back a lay of particles under 0,001 mm.

### Induced Waves

Ocean Team differentiates by adding induced waves to the process of turbulent conventional oil flushing. We expose the flushing oil to pulses, caused by sudden

and controlled compressions, in order to create sound waves (induced waves) and an even higher Reynold number in the pipe system. The higher Reynold number the more effective turbulent flow you get.

**The result is a faster and more effective removal of impurities from the inside of pipe systems.**

The success of the flushing process is depending on many different parameters. Ocean Team always plans and tailors the solutions to the individual job to ensure the best possible results with the least trouble for the customer. We focus on being quick, efficient, reliable and safe.

### References

As a job reference, Ocean Team has performed oil flushing of hydraulic spools in the top drive system at Noble Byron Welliver. Facts about this job are listed below.



#### FACTS

<b>Place:</b>	Noble Byron
<b>Job description:</b>	Flushing of 1½" pipes between power unit and monkeyboard.
<b>Degree of purity:</b>	NAS class 5
<b>Used filtration:</b>	3 my
<b>Equipment:</b>	OTS.200.200.7.ACMU.SS316

Enclosed are pictures from the job and datasheet on the used equipment. We have similar equipment approved for operation in Zone 2 gas areas.

Datasheet on the explosion-proof version is also enclosed. For further references Ocean Team has performed flushing of hydraulic systems for several well-known companies, including Maersk Drilling, Maersk Oil, Hess and Dong Energy.

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