



## **Case study:** Tornar Wellbore Cleaning Technology

# Archer Oiltools' successful wellbore cleaning job for an OMV well in the Barents Sea

### **Efficient Wellbore Cleaning for OMV**

Archer's Tornar<sup>®</sup> wellbore cleaning focuses on wellbore design and the objective to clean the wellbore in an efficient and reliable way. A Tornar wellbore clean-up operation enhances efficiency by reducing risk and non-productive time. The use of mechanical wellbore clean-up tools enables the removal of debris that interferes with normal operations without damaging the well structure. An effective and successful wellbore clean-up is the key to ensure successful completion installation and maximum well return.

### **Challenge**

OMV was planning a horizontal appraisal well to be drilled by the Transocean Spitsbergen, targeting the Stø formation in the Barents Sea, north of Norway. This appraisal well was to verify sufficient hydrocarbon volumes to justify field development. The plan was to test the "producibility" of the Stø reservoir through a well test, followed by plugging and abandoning the well.

A wellbore clean-up run with magnets, brushes and scrapers prior to running the DST string was necessary to clean and displace the wellbore. This will ensure successful DST installation. The wellbore was proven difficult with a TVD of only 680 meter (2230ft) and 2354meter (7723ft) MD, 9 5/8" Casing, 7" liner and 5" liner. A combination of 5 7/8" HWDP and 5 7/8" drill pipe was used to improve buckling resistance and add sufficient weight.

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**Region:** Barents Sea

**Customer:** OMV

**Field:** Wisting

**Rig:** Transocean Spitsbergen

**Well Type:** Oil & Gas

### **Case benefits**

- Effective wellbore cleaning
- Clean and solids-free wellbore
- Reduced BOP maintenance
- Reduce BOP swarf that could cause failures

### **Key capabilities**

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### **Features**

- One-piece mandrel
- Non rotating stabilizers
- Non rotating magnet sleeve
- No external nuts or bolt
- Extra large bypass areas for eliminating flow restrictions
- Balanced annular velocity
- Continues pumping during displacement

### **Benefits**

- Eliminates casing wear
- High strength mandrel
- Simple to run
- Large debris capacity
- High strength single pole magnets
- Multiple run possible
- Withstands drilling and milling operations

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### Solution

Archer's Tornar wellbore cleaning technology rapidly and effectively cleaned and displaced the wellbore by, maximizing and balancing the annular velocity in different wellbores. The Tornar Balanced Circulation Valve is specially designed to balance the fluid velocity in wellbores of different sizes during the displacement. This valve can isolate the rotation of the lower drill string while circulating.

### Operation

The entire clean-up string, consisting of 7 clean-up assemblies was sent to the rig and was pre-made with handling joints for easy handling. Firstly, a Tornar BOP Cleaning operation was performed to ensure a clean BOP. After a successful BOP cleaning, the wellbore clean-up assembly's was run in hole as planned. Tagged top of liner with the Tornar landing sub and Tornar Balanced Circulation Valve, with bit at 2340m (7677ft), pulled up and started circulating 2 times the 7" and 5" liner volume with 1500 lpm (396 usgpm) and valve in closed position.

Without stopping the pumps, the string was moved down to open the Tornar Balanced Circulation Valve by tagging top of liner with 6 metric tons and the pump rate was increased to 2800 lpm (740 usgpm) and 80 rpm rotation of the string. Continue pumping bottoms up before lifting the string and closing the Tornar Balanced Circulation Valve. The operation was finalised by pumping the high viscosity pill, base oil and displacing the well to low solids oil-based mud.

### Result

This particular operation resulted in a clean and solids-free wellbore. Due to the positive result of wellbore cleaning, DST operations could continue without interference, which resulting in zero hours rig down time.



7" Tornar magnet with debris.



Tornar casing scraper.