Modular VACS System Cleaned Wellbore and Retrieved Plugs in One Trip
Delivered advanced wellbore cleanup in deepwater well

Benefits
- Reduced nonproductive time and operation risk
- Ensured success of frac-pack completion
- Minimized impact to perforation and formation

Background and challenges
- Gulf of Mexico
- Deepwater well with 2,949 ft (898 m) water depth
- 9¼-in., 62.8-lb/ft casing
- 22,000 ft (6705 m) measured depth and 35° well angle
- The operator needed to clean perforation burrs, remove debris on top of packer plugs, and retrieve packer plugs for top and middle intervals with minimum operation cost and time

Baker Hughes solution and results
- VACS system includes a packer plug retrievable tools, modular VACS system, Grabitz™ downhole magnets, and FFV to complete all required operations in one trip
- The upper and middle zones were successfully cleaned up and packer plugs were retrieved
- In middle zone, VACS system recovered 374 lb (169.6 kg) of debris
- In upper section, VACS system recovered 571 lb (259 kg) of debris
- Perforation interval was polished using string mill and isolation packer plug was recovered in one trip

An operator in deepwater Gulf of Mexico had planned a triple-stacked frac-pack completion in the intervals perforated with length of 136 ft, 359 ft, and 456 ft (41.4 m, 109.4 m, and 139 m). The operator needed to clean the perforation burrs, remove the debris on top of the packer plugs, and retrieve packer plugs for the top and middle intervals with minimum operation cost and time.

Baker Hughes designed a vector annular cleaning system (VACS™) technology that combined a variety of fishing and wellbore cleanup tools to meet the operator’s needs in one trip. The modular VACS system allowed for faster make-up and debris collection on the rig floor, and improved debris capture capability with two separate debris chambers. The full function valve (FFV) gave the operator the ability to open communication to the annulus after cleaning up the gun debris with the VACS system to circulate bottom up at high rate. The FFV also provided the ability to shift back closed, giving the operator the option to reactivate the VACS tool if needed.

In the lower zone, all tubing-conveyed perforating (TCP) debris fell in the sump and no cleanup was requested. In the middle zone, the VACS recovered 190 lb (86.2 kg) of coarse TCP debris in the lower stackable diverter section and 169 lb (76.7 kg) of fine sand in the upper diverter section. The downhole magnets recovered 15 lb (6.8 kg) of fine metal shavings. The perforation intervals were polished using the string mill and the isolated packer plug was recovered in the same trip.

In the upper zone, the VACS recovered 350 lb (158.8 kg) of sand and TCP debris in the lower debris retaining module and 210 lb (95.2 kg) of fine sand and TCP debris in the upper debris retaining module. The downhole magnets recovered 11 lb (5 kg) fine metal shavings. The perforation intervals were polished using the string mill and the isolated packer plug was retrieved successfully in the same trip.

The operation saved customer rig time, reduced operational risks, minimized impact to formation, and ensured the success of the triple-stacked frac-pack completion.

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