



MPD Solution: Unsticking Differentially Stuck Pipe

An operator in Canada utilized Managed Pressure Drilling (MPD) to successfully UNSTICK differentially stuck pipe. A constant bottom hole pressure (CBHP) MPD solution was designed and executed by optimizing the static and dynamic surface backpressures. MPD provided enough flexibility for the operator to safely reduce the wellbore pressure below pore-pressure and decrease the differential pressure to free the pipe.

Pruitt's MPD package with Coriolis meter and dual chokes was used to manage the annular pressure profile. The MPD system could detect fluid gains and losses within a few liters enabling fast response. The choke response was very quick enabling quick control.

CBHP MPD can also help drill through narrow pressure windows, provide early kick detection, improve ROP, minimize surge and swab issues, help with pore-pressure and leak-off prediction, 'drilling with casing' and cementing.

Details: An operator in Canada Pruitt MPD Services to unstick drillpipe.

1. When drilling with 1.32 SG mud, operators encountered an influx. An initially calculated 1.40 SG mud became insufficient and the mud weight was increased to 1.67 SG. The pore pressure was increased causing losses and the pipe becoming differentially stuck.
2. Using CBHP MPD and applying 5500 kPa surface backpressure, 36m³ of .90 SG base oil was placed in the annulus which diluted to 1.37 SG equivalent BHP. Base oil was displaced by 1.67 SG mud.
3. The MPD Matrix was generated and a maximum allowable pit gain was agreed to be set at 5 m³.
4. When the rig was ready to work pipe, backpressure was released and the pipe was pulled four times, then torqued and pulled twice again to get it free. A total of 2.2 m³ was introduced into the annulus in 18 minutes of operation.
5. The 5500 kPa backpressure was re-applied while the influx was circulated out using MPD equipment.

Challenges / Problems

Drillpipe stuck differentially and the pore pressure gradient was very close to the mud density used.

Action / Solutions

Design, plan, and execute CBHP MPD to lower differential pressure and work pipe to free it.

Execution / Results

Successfully released pipe by reducing the wellbore pressure below the pore-pressure to reduce the differential pressure and pulling on the pipe. The influx volume was limited to less than the maximum allowable limit, and was circulated out with MPD.

