Wells with Multiple Shearable Valves Using Barrier Qualified Casing Activated Shearable Technology

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Abstract:

OBJECTIVES/SCOPE:

This paper presents the patented barrier qualified casing activated shearable valve technology. casing shearable (CS) was developed to deliver wells with remote operations and without applying limitation to other technologies within the Completion:

- Enable unlimited number of shearable valves without intervention.
- No limitations to packer setting pressure, packer test pressure and well design pressure.
- Simplifies the operational steps from running the Completion, setting, and testing the Completion, until bringing the well on production.
- Reduced rig time, no need for intervention, reduced safety risks, and accelerate well start-up process.

METHODS, PROCEDURES, PROCESS:

The wells were previously completed with a tubing shearable unloading valve and conventional casing shearable gas-lift valve to avoid the need for interventions.

Replacing the tubing shearable with casing shearable valve has eliminated the concern of potentially pre-shearing the valves due to changes in fluid density prior running completion (hydrostatic pressure). Additionally, all risks have been removed related to pre-shearing valves during setting/testing of annular safety valve and production packer.

The patented casing shearable technology has removed operational limitations as the valves are sheared during the annulus packer testing without any impact to the conventional test-program.

The annular safety valve inflow test and the production packer test is performed in the same manner as for a well without gas-lift valves.

RESULTS, OBSERVATIONS, CONCLUSIONS:

This paper illustrates the successful installation of the barrier qualified casing shearable technology in multiple gas-lift wells on the Norwegian continental shelf, which reduced the well construction cost, eliminated risk of prematurely shearing valves due to interference with pressure window for other technologies, and eliminated slickline activities with associated HSE risk.

The activation of the barrier qualified casing shearable unloading valve and casing shearable orifice valve was achieved by performing the conventional pressure sequence in the annulus to test the production packer and inflow test the annulus safety valve, and without any limitations to the conventional operational procedures. The valves opened when the surface-applied annulus pressure bled back to zero.

The tubing integrity test was successfully conducted during inflow testing of the tubing retrievable safety valve in the tubing retrospective of activating the casing shearable valves, according to the same operational procedures as for a well without gas-lift. None of the pressure activities on the annulus or tubing were performed specifically for the casing shearable valves.

The authors will discuss the patented casing activated shearable technology which was developed to enhance operations in gas-lifted wells. casing activated shearable is the only shearable valve in the industry where shear pressure can be set without concern for impact to packer setting and testing pressures, eliminating the need for the fracture mechanism to break within tight tolerances to accommodate a specific completion program. In the majority of applications, the casing shearable valves can be installed without making a difference to the operational program without valves in the well.