

Case History

Tubing-Retrievable Safety Valve Being Developed for Ultradeepwater, HP/HT Completion

Problem

The operator wants a tubing-retrievable safety valve (TRSV) for ultradeepwater, high-pressure/high-temperature (HP/HT) applications. The valve needs to be capable of being fail-safe close at depths in excess of 10,000 ft (3048 m), rated for working pressures of 20,000 psi (1379 bar), and 375°F (191°C) temperatures, and open with less than 17,500 psi (1206 bar) for subsea installations. Current safety valve designs are not capable of meeting the combination of working pressure, setting depth, and opening pressure requirements.

Solution

- A new TRSV is being developed to meet the application requirements for this ultradeepwater HP/HT application.
- The operator is assisting with funding of the development of this product to meet the unique needs of their application.
- The TRSV uses field-proven heavy sprung technology to ensure reliable operation in the deep-set HP/HT environment and incorporates a unique operating system that provides for opening pressures within the limitations posed by subsea installations.
- The valve will be subjected to an extensive safety valve prototype test program as well as operator-specified testing for their unique application and will be qualified for API-14A Class II Sandy Service.

Results

The Nautilus TRSV for this application is currently in engineering development and will soon begin prototype testing to validate the valve operation at the specified conditions. BP is an active participant in the review of the product design and there is ongoing communication between Baker Hughes and BP to ensure the product development meets the expectations of both parties.

Project Details

Location: Gulf of Mexico, worldwide potential for BP

Anticipated Valve Setting Depth: 10,600 ft (3231 m)

Working Pressure: 20,000 psi

Rated Temperature: 35°F-400°F (1.67°C-204.4°C)

Closure Against Flow: 300 ft/sec (gas slam) and 49,000 bpd

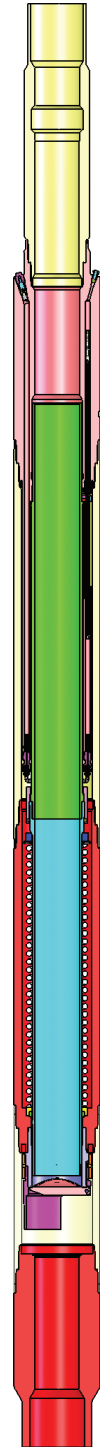
Casing Size: 10-3/4 in., 108.7 lb/ft

Valve ID: 3.750 in.

Valve OD: 7.760 in.

Tubing Size: For use with 5-in., 26-lb/ft and 5-1/2-in., 29.7-lb/ft Vam Top HT

Completion Fluid: 10.7 lb/gal annulus fluid



Nautilus with end subs