

Mumbai Well Services conducts Intelligent Well Completion

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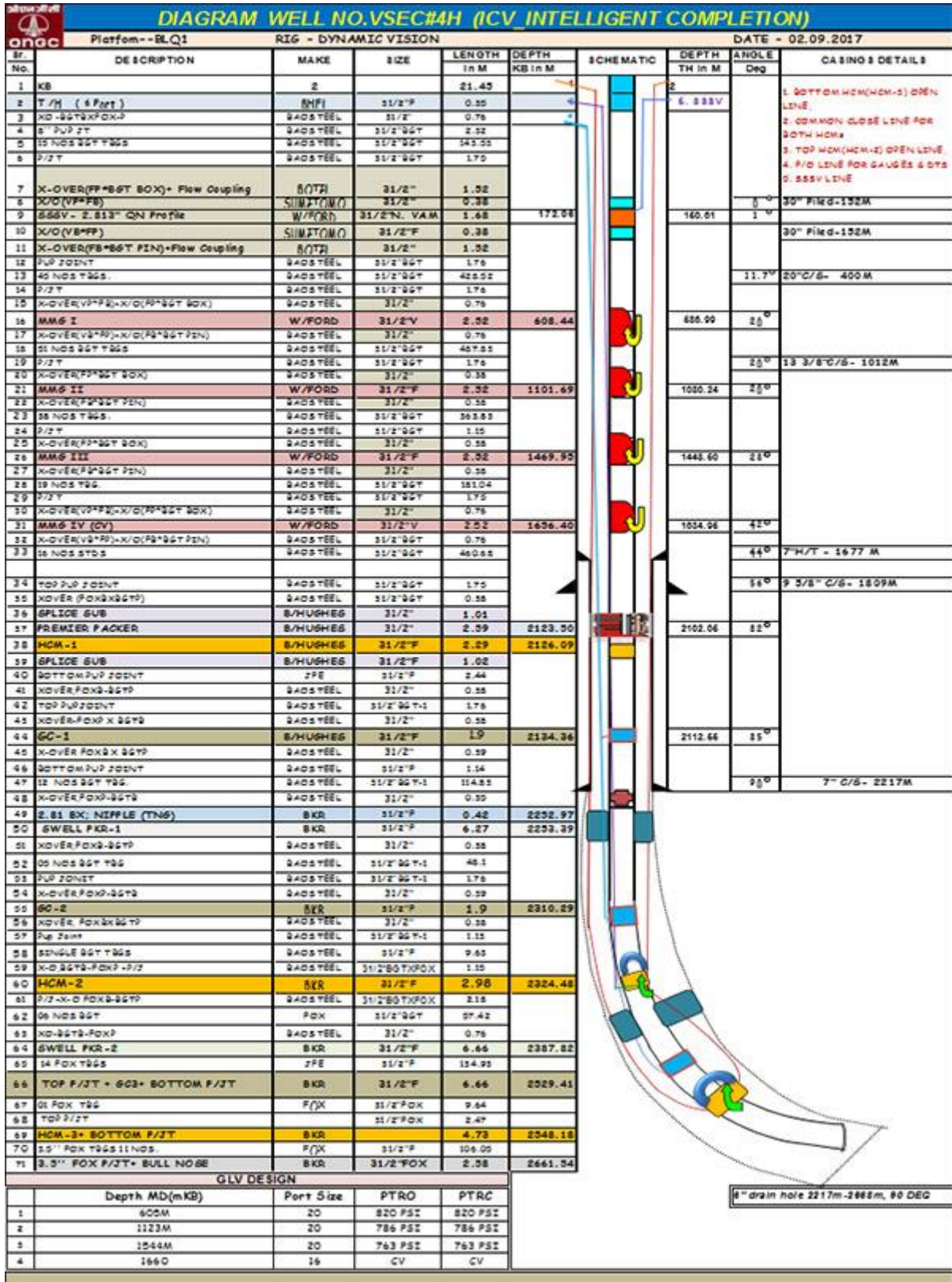
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Mumbai Well Services has added a DTS (Distributed Temperature Sensing) in the well production profile, based on Fiber optics. Such Intelligent well completions are the latest trend in the Oil and gas production arena of World Petroleum Scenario where various degree of sophistication with cutting edge technology has been achieved the world over. This enables better data acquisition for the cost effective well production management as well as better reservoir management with least or no intervention jobs. In the early version of Intelligent Completion (IC), the reservoir is segmented / isolated with swell packers based on the differential characteristics throughout the reservoir with each segment having pressure data recording at the surface through electric cable on continuous basis. Each segment has surface controlled hydraulically-operated ICV (Interval Control Valves). Therefore, production behavior of each segment can be assessed and controlled from surface through hydraulically operated ICV. This success has been pursuant to the persistent endeavor of Mumbai Well Services to introduce/ adopt cutting edge technology in its operations.

In this system, not only temperature of all segments of the producing reservoir is captured but it also gives the temperature profile of vertical performance. Hence without carrying out pressure and temperature gradient survey, the operator of the well is able to conclude whether gas lift system is working well or not and remediation job can be taken accordingly. Similarly which segment of reservoir is producing excessive water or gas can be known and can be controlled from surface through hydraulically operated ICV. DTS basically consists of Fiber Optical Line functioning as linear sensors and works on the principle of **Raman effect**. The DTS interrogates the fiber sensor by firing short pulses of light into the fiber and monitoring the backscattered signal. The backscattered signal from one pulse of light is too weak to produce an accurate temperature profile. Therefore, thousands or millions of pulses are fired and the backscattered signal is averaged to improve the signal-to-noise ratio. The number of pulses which can be averaged is dictated by the measurement time of the DTS.

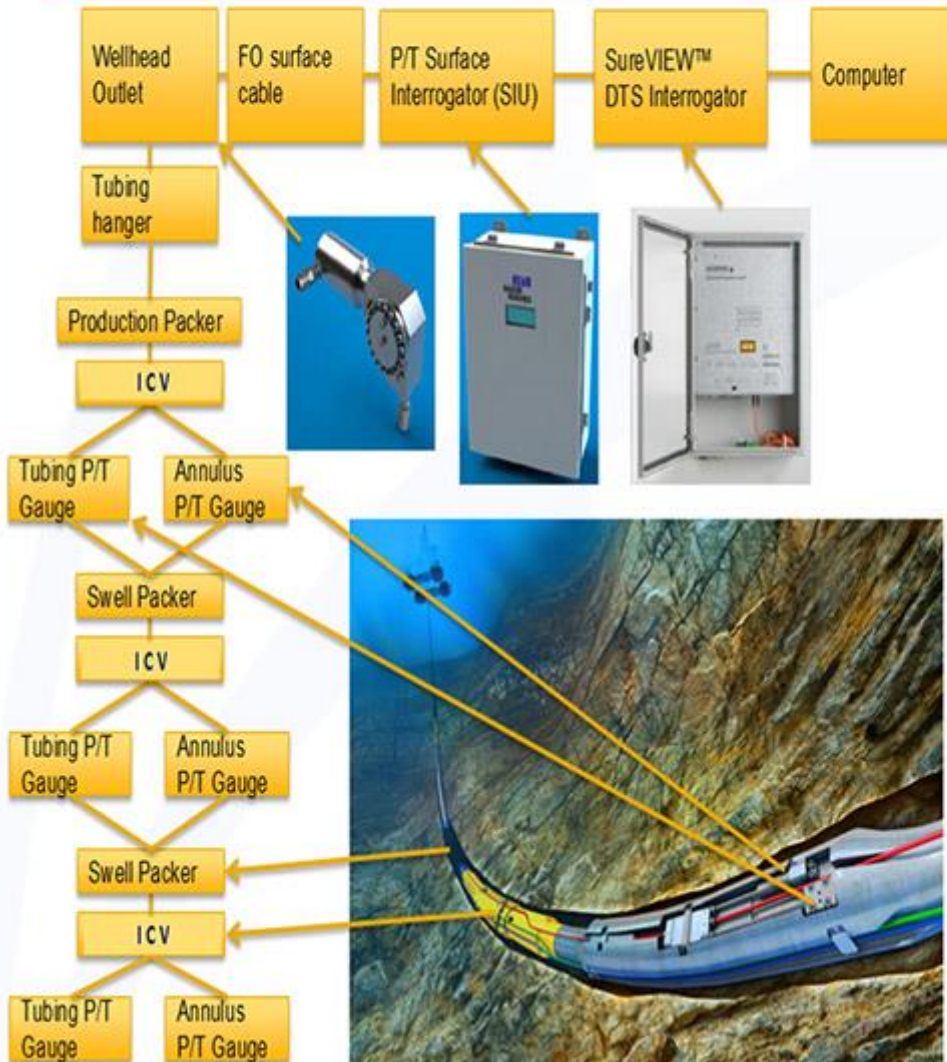
Temperatures are recorded along the optical sensor cable, thus not at points, but as a continuous profile. Well Completion Diagram is provided at Fig 1 and Simple Well Schematic along with Surface system is provided at Fig.-2. **This is the first ever successful installation of Intelligent Completion System with Fiber Optics DTS in offshore well no. VSEC-4H of B&S Asset in India.**

This feat could be achieved with synergic team work of Well Services, B&S Asset and Rig **Dynamic Vision** Drilling team under the guidance of ED- Asset Manager B&S asset, ED-HWS, Well services, Mumbai and GGM(Res.)- SSM, B&S Asset Manager.



Well completion Diagram

System Layout



Well Schematic - VSEC#4H



ONGC, BHGE and Dynamic Vision Team at Rig site after successful completion of the job.

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