

RINGKASAN

Sumur-sumur produksi di Tanjung *Field* saat ini sudah menggunakan *artificial lift* dengan 85 % *sucker rod pump (SRP)*. Berdasarkan data Juli 2020-Januari 2021, terdapat 54 kali *well service* di Struktur Tanjung, 39 kejadian (72 %) disebabkan *tubing leak* dan *parted rod*, 8 kejadian (15 %) disebabkan *low pump efisiensi* dan 7 kejadian (13 %) disebabkan oleh *pump stuck*. Periode tersebut sumur TJG-140 mengalami 2 kali perawatan sumur akibat *tubing leak*. Pertama pada November 2020 ditemukan *tubing bocor* pada *joint* ke-62 dengan *lifetime* 135 hari, kemudian merubah desain dengan mengganti material *tubing* dan penambahan *rod guide* sebanyak 1 (satu) buah pada setiap *rod string*. Kedua terjadi pada Januari 2021 ditemukan *tubing* bocor pada *joint* ke-110 dengan *lifetime* 45 hari. Pada November 2020 *design* yang terpasang sudah mengganti material *tubing* dan penambahan *rod guide* sebanyak 1 (satu) buah setiap *rod string*, namun ternyata *design* tersebut masih belum efektif dalam meningkatkan *lifetime* sumur dikarenakan pemasangan *rod guide* belum optimal baik dari segi jumlah ataupun jarak antar *rod guide*.

Redesign rod guide perlu dilakukan dengan pendekatan konsep *neutral point*. Ada beberapa hal yang harus dilakukan terlebih dahulu untuk mendapatkan hasil yang optimum. Pertama menghitung potensi sumur (IPR) dan menghitung ulang SRP berdasarkan data. Kedua menghitung *neutral point* rangkaian SRP sesuai *design*. Ketiga menentukan koefisien *buckling (wear point)* dari hasil plot *neutral point* sumur SRP vs data *real (tubing leak)*. Keempat menentukan kedalaman *buckling point* berdasarkan data *neutral point* dan koefisien *wear point*. Kelima menghitung kebutuhan *rod guide* yang akan digunakan. Keenam melakukan pemasangan dan monitoring.

TJG-140 mempunyai Q_{max} IPR sebesar 479 BFPD. Pada *design* diharapkan berproduksi sebesar 439 BFPD atau 92% dari Q_{max} . *Neutral point* berada 667 ft di atas pompa atau 2876,06 ft dari permukaan. *Wear point* di 3285,6 ft atau sambungan *tubing* ke 105,3 dari permukaan dan jumlah *rod guide* sebanyak 26 ea. Pemasangan dilakukan Januari 2021 dan monitoring sampai akhir 2021. Selama monitoring, terjadi 2 kali perawatan tanggal 25 Juli 2021 akibat *scale* menutupi *pump intake* dengan *lifetime* 197 hari dan 21 November 2021 akibat *pump stuck* dengan *lifetime* 119 hari. Selama 2021 tidak mengalami perawatan sumur akibat *tubing* bocor atau *rod parted* sehingga meningkatkan *lifetime* sumur dari 45 hari menjadi 197 hari.

Kata Kunci: *optimasi produksi, rod guide, tubing leak, lifetime, sumur TJG-140*

ABSTRACT

Currently production wells in Tanjung Field have used artificial lift to produce oil with 85% artificial lift sucker rod pump. Based on data July 2020 – January 2021, there are 54 times well service programs in Tanjung Structure. 39 times (72%) due to tubing leak and rod parted, 8 times (15%) due to low pump efficiency and 7 times (13%) due to pump stuck. During that period TJG-140 well has 2 times well services due to tubing leak. The first in November 2020 was found tubing leak at the 62nd joint tubing with a lifetime of 135 days, then carried out by changing the design by replacing the tubing and adding one rod guide for each rod string. The second in January 2021 was found tubing leak at 110th joint from surface with a lifetime of 45 days. In November 2020 the design had replaced the tubing and added one rod guide for each rod string, but the design is still not effective in increasing the lifetime of the well because the installation of rod guides is not optimal both in terms of number and distance between rod guides.

Redesign of the rod guide needs to be done using a neutral point concept approach. There are several things that must be done first to get optimum results. First, calculate the well potential (IPR) and recalculate the SRP based on the data. Second, calculate the neutral point of the SRP string according to the design. Third, determine the buckling coefficient (wear point) from the neutral point plot of the SRP well vs real data (tubing leak). Fourth, determine the depth of the buckling point based on neutral point data and wear point coefficient. Fifth, calculate the need for the rod guide that will be used. Sixth, carry out installation and monitoring.

The TJG-140 has a Q_{max} IPR of 479 BFPD. The design is expected to produce 439 BFPD or 92% of Q_{max}. The neutral point is 667 ft above the pump or 2876.06 ft from the surface. Wear point at 3285.6 ft or tubing connection number 105.3 from the surface and the number of guide rods is 26 ea. Installation was carried out in January 2021 and monitoring until the end of 2021. During monitoring, there were 2 times well services on 25 July 2021 due to scale covering the intake pump with a lifetime of 197 days and 21 November 2021 due to a pump stuck with a lifetime of 119 days. During 2021 there will be no well service due to tubing leak or rod parted thereby increasing the lifetime of the well from 45 days to 197 days.

Keyword: *production optimization, rod guide, tubing leak, lifetime, TJG-140 well*