ABSTRAK

PERENCANAAN *ELECTRIC SUBMERSIBLE PUMP* PADA SUMUR TLD-01 DENGAN GLR TINGGI DI PERTAMINA EP ASSET 3 LAPANGAN JATIBARANG

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Sumur "TLD-01" Lapangan Jatibarang merupakan sumur baru yang akan diproduksikan dengan metode *artificial lift* berupa *Electric Submersible Pump*. *Electric Submersible Pump* dipilih berdasarkan *screening criteria* yang paling sesuai dengan data Ekploitasi pada Juni 2020. Laju alir minimum yang diharapkan sebesar 495 Bopd dengan tekanan alir dasar sumur sebesar 4000 psi, *water cut* yang tergolong *medium to high* yaitu sebesar 65%, dan GLR sebesar 102463 Scf/Stb. Hal tersebut dapat menyebabkan menyebabkan masalah *gas lock*, sehingga diperlukan perencanaan design ESP yang sesuai dengan kondisi sumur tersebut.

Perencanaan design ESP diawali dengan menghitung IPR dengan metode IPR Vogel dengan Qmax sebesar 613 Bfpd. Laju alir target Sumur "TLD-01" pada 70% dari Qmax-nya sebesar 430 Bfpd. Tahapan dalam perencanaan ESP meliputi pengumpulan data, pembuatan kurva IPR, penentuan laju alir pompa, penentuan kedalaman pompa, perhitungan *Pump Intake Pressure*, perhitungan *Total Dynamic Head*, pemilihan pompa dan jumlah *stages*, serta pemilihan peralatan pendukung ESP di permukaan.

Hasil pemilihan pompa yang sesuai dengan *rate optimum* dengan sensitivitas jumlah *stages* untuk Sumur "TLD-01" adalah D460N/60Hz/43 *stages*. Pompa diletakkan pada kedalaman 7800 ft diatas perforasi, dengan menggunakan *Rotary Gas Separator* REDA 400/400 VGSA D20-60, 400/400 dengan efisiensi sebesar 80% menghasilkan kadar gas bebas 2% dan nilai turpin 0.004<1 yang menunjukkan tidak ada gangguan pada pompa. Pemilihan peralatan pendukung ESP untuk mendukung kinerja pompa di antaranya: Tipe motor yang digunakan adalah 400 Series ES Carbon Steel Motor. Spesifikasi untuk Sumur "TLD-01" adalah 50 HP / 509 V / 62 A. Kabel dipilih dengan jenis RedaBlack*ESP Power Flat Cable No. 4 Conductor tipe ETBEF-300 AWG#4 Conductor 4/Solid dengan OD 1,5 inch. Transformator dipilih dengan tipe Three Phase Dual Wound, OISC Type, 75 kVA -7200/12470Y Primary dan VSD dipilih dengan tipe SpeedStar 2000 Plus VSDs-NEMA 3R, 6 Pulse, 122°F [50°C] Ambient Temperature Rated @480V output 100 A.

Kata Kunci: *Electric Submersible Pump, Gas Liquid Ratio, Gas bebas*

ABSTRACT

PLANNING OF DESIGN ELECTRIC SUBMERSIBLE PUMP IN TLD-01 WELL WITH HIGH GLR IN PERTAMINA EP ASSET 3 JATIBARANG FIELD

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The "TLD-01" well in the Jatibarang Field is a new well that will be produced using the artificial lift method in the form of an Electric Submersible Pump. The Electric Submersible Pump was selected based on screening criteria that best fit the Exploitation data for June 2020. The flow rate required minimum is 495 Bopd with a well bottom flow pressure of 4000 psi, the water cut is classified as medium to high, which is 65%, and the GLR is 102463 Scf/Stb . This can cause gas lock problems, so it is necessary to plan an ESP design that is in accordance with the conditions of the well.

ESP design planning begins with calculating the IPR using the IPR Vogel method with a Qmax of 613 Bfpd. The target flow rate of Well "TLD-01" at 70% of its Qmax is 430 Bfpd. The stages in ESP planning include data collection, making IPR curves, determining pump flow rates, determining pump depth, calculating Pump Intake Pressure, calculating Total Dynamic Head, selecting pumps and the number of stages, and selecting ESP supporting equipment on the surface.

*The results of selecting the pump according to the optimum rate with the sensitivity of the number of stages for the "TLD-01" well is D460N/60Hz/43 stages. The pump is placed at a depth of 7800 ft above the perforation, using a Rotary Gas Separator REDA 400/400 VGSA D20-60, 400/400 with an efficiency of 80% producing a free gas content of 2% and a turpine value of 0.004<1 which indicates no interference with the pump . The selection of ESP supporting equipment to support pump performance includes: The type of motor used is the 400 Series ES Carbon Steel Motor. The specifications for the Well "TLD-01" are 50 HP / 509 V / 62 A. The cable is selected with the type of RedaBlack*ESP Power Flat Cable No. 4 Conductor type ETBEF-300 AWG#4 Conductor 4/Solid with 1.5 inch OD. The transformer was selected with the type of Three Phase Dual Wound, OISC Type, 75 kVA -7200/12470Y Primary and the VSD was selected with the type SpeedStar 2000 Plus VSDs-NEMA 3R, 6 Pulse, 122°F [50°C] Ambient Temperature Rated @480V output 100 A*

Keywords: Electric Submersible Pump, Gas Liquid Ratio, Free gas