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Lining Drive Stabilizers for Screw Pumps

Marius Stan

Universitatea Petrol-Gaze din Ploieşti, Bd. Bucureşti 39, Ploieşti
e-mail: mstan@upg-ploiesti.ro

Abstract

Method used for determining the number needed for stabilizers leaving the precondition placing them equally, though lining free (without stabilizers) loses its stability after a cvasisinusoidală.

Key words: *energetic method, stabilizers, lining the drive*

Introduction

Action pumps with screw is made from the of through the gar- along the flat which, in our country, has the kind used in low with Canadian pumps (piston). In this situation, after losing stability, de request complex spreading, torque and bending. scope lining the flat's increasing the speed true stability which appears loss, while twisting the opposite effect. because very flat and very small diameter large, achieved the work, lining it loses its stability is pulling its constraints by placing the issue of stabilizers (contrary of rubber) extraction (fig. 1).

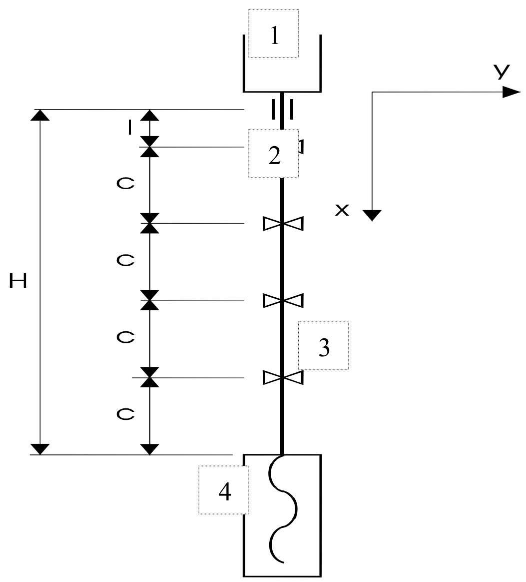

Fig. 1. The geometric model for the pumping installation

Where: 1 is head of the drive (beadily at area) 2-lining drive 3-centrors 4-pump with a screw. For determination required number of stabilizers, presented a method energy approximate starting from the precondition his. In this respect is considered the thing mechanical forces acting on the line pipe drive "l" form entirely in energy potential of deforming "u", at $l = u$ the

$$EI\pi^4 \frac{l+r-k^2}{(H-l)^3 r} - F_0 \frac{\pi^2}{H-l}(r+l) - q\frac{\pi^2}{2k}(r+l)^2 - \frac{q}{g}\omega^2 \frac{H-l}{k^4}\left(k^2 r^3 + 1\right) = 0$$

where: F_0 is the force degree introduced the pump operation; Q-weight unit of line drive,G-acceleration gravitational pull; E-module the elasticity of the material line drive; I-moment of inertia geometric section's cross line drive. The equation: where: K means the number of stabilizers and r = l / C. He thinks a lining with data from below, has been built Tab. 1:

Table 1 The number of "k" stabilizers equation resulted in the settlement

F_0=0 kN	d [in]	ω [rad/s]	5	10	20	30	40	50	60	70
	5/8	K	13.4	14.3	16.0	17.5	18.6	19.6	20.5	21.3
	¾		12.5	13.5	15.3	16.6	17.7	18.7	19.6	20.3
	7/8		11.9	12.9	14.6	16.0	17.1	18.0	18.8	19.6
	1		11.3	12.3	14.1	15.4	16.5	17.4	18.2	18.9
F_0=1 kN	5/8	K	17.8	18.0	18.8	19.6	20.4	21.1	21.8	22.5
	¾		15.3	15.7	16.8	17.8	18.7	19.6	20.3	21.0
	7/8		13.7	14.3	15.5	16.7	17.6	18.5	19.3	19.9
	1		12.6	13.3	14.7	15.9	16.8	17.7	18.5	19.1

In our case to elect K=18 or K = 21 contrary. The three additional stabilizers mounted above the pump for the decrease of introduce use vibration screw through its small cinematic resulting from working principle. At speeds of over 400-500rot/MIN this influence becomes almost nil.

Conclusions

The method used for determining the number needed for stabilizers leaving the precondition placing them equally, though lining free (without stabilizers) loses its stability after a sinus form, with diesinkers distance between nodes with depth. For reasons technological first stabilizing mount the head of the drive, at a distance of about 10.Force degree "F_0" what appears on the way pump during officials did not influence significantly the number of stabilizers. In this case to number of stabilizations is K=18 or K = 21 contrary.

References

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Stabilizatorii garniturii de antrenare a pompelor cu surub

In acest articol este prezentat modul de aplicare a metodei energetice la modelarea miscarii garniturii de antrenare a pompelor cu şurub si rezultatele de calcul pentru determinarea numarului de stabilizatori ai miscarii garniturii de pompare a pompelor elicoidale folosite la extractia petrolului Se mentioneaza faptul ca rezultatele obtinute in urma rezolvarii modelului corespund cu rezultatele din practica unor firme de renume.