

Site report

Application of piston pumps in the oil industry

Putzmeister

1



Hocol plant in la Hocha, Colombia

File under: A 1.00, A 4.00, IP 4.05

2



Platform with two pumps

Hocol, a subsidiary of the state owned oil company Ecopetrol, is a Colombian exploration and oil production company, which operates in the area of Upper Magdalena Valley and Central Plains.

In May 2009, Ecopetrol and the French company Maurel & Prom agreed the sale of Hocol from the French company to the state owned company. At this moment Hocol produced 22 thousand barrels of oil per day. Because of some of the produced oil contains sand a special plan was designed in order to pump this oil with special pumps which are different of the normally used in the oil industry.



This oil is particularly obtained in the exploitation zone La Hocha which is located approx. 290 km southwest from Bogotá, the capital of Colombia. It is in the Central Cordillera at a high of 700 m above sea level on the occidental side of the important and abundant flowing Magdalena River.

Product which must be pumped

The oil has special characteristics: it contains sand, salt and water. The sand concentration is relatively high for any pumping system and salt in presence of water is corrosive. This mixture coming from several oil wells must arrive a centralized treatment area, where the hydrocarbon is separated from the other products.



Hocol oil tanks



Oil

Some data of the product

Fluid:	sandy oil PH = 7
Solids content:	23%
Density:	1,350 kg/m ³ (84,3 lb/ft ³)
Viscosity:	1250 cSt (1650 cP)
Temperature:	100 °F (38 °C)
Salt:	49 PTB
Water:	11 %

Particle size distribution

Diam. [µm]	%
2000	0,02
1500	0,22
1000	1,88
600	4,19
425	8,52
300	13,54
212	17,19
150	17,61
106	14,60
75	13,77
45	8,43
10	0,04



Oil well



Sand residues

Grain size of the sand

The sand present in the oil has a grain size which varies from 10 microns to 2 mm. This is also a challenge for pumping, because disaggregation of the bigger and heavier particles must be avoided by transporting the product in the tubes at an adequate speed of approx. 0,2 and 0,6 m/s without excessive abrasion.

Pump specification and selection

Because of what was said above these characteristics of the product, which must be pumped, present a special exigency for the pumps. The specifications of the engineering company Bohórquez Ingeniería Ltda. were the following:

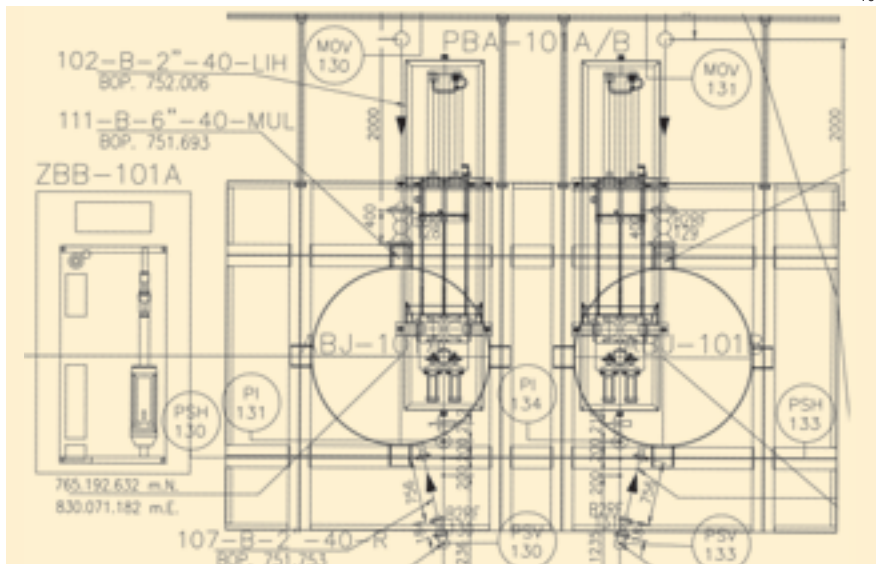
The production of an oil well can not be stopped, because the well could get blocked up with very high costs of unblocking and operation restart. Because of this reason the engineering company asked for all platforms two equal pumps, one to be in operation and the other in stand-by.



Another platform with HSP 1050 pumps



HSP 1050 at site ready for installation



Platform layout



Hydraulic power pack outside explosion area

Putzmeister Solid Pumps delivered six pumps of the type HSP 1050 with hydraulic power packs with 22 kW and 45 kW.

The HSP series pump is an oil-hydraulic piston pump with hydraulically actuated seat valves and it is used with paste like and highly viscous material with a low content of foreign bodies and small particle sizes (<5 mm)

The product which must be pumped is very combustible and because of this the pumps were manufactured in an ex-proof version (ATEX).

The hydraulic power packs and the electric control cabinets were not ex-proof, so they must be installed outside the explosion risk area.

Pump Specification

Flow:	Between 15 GPM (3.4 m³/h) and 89 GPM (20.2 m³/h)
Delivery pressure:	Between 400 psig (27.6 bar) and 450 psig (31.0 bar)
Conveying distance:	Between 400m (1312 ft) and 2500m (8202 ft)

Member of the Putzmeister Group
www.Putzmeister.com



Right to make technical amendments reserved
© by Putzmeister Solid Pumps GmbH 2012
All rights reserved
Printed in Germany
(.51203SC)

Actual situation

Because of investment priorities of the company Hocol, the mentioned pumps were tested on site but the definitive start up is postponed.

Conclusions

Criteria for using Putzmeister double piston pumps are their suitability for pumping dense fluids with abrasive components like silicates in the sand. The operation of the pumps with a low quantity of strokes per time unit and the almost straight flow in the cylinders ensures a low wear. In the valve head, where the most wear is expected, the Putzmeister pumps offers a good access to facilitate maintenance and to reduce the maintenance time.



The HSP in ATEX design



Hydraulic power pack HA 45 CI

Putzmeister Solid Pumps GmbH
Max-Eyth-Straße 10 · 72631 Aichtal/Germany
P.O.Box 2152 · 72629 Aichtal/Germany
Tel. +49 7127 599 500 · Fax +49 7127 599 988
psp@pmw.de · www.pmsolid.com