

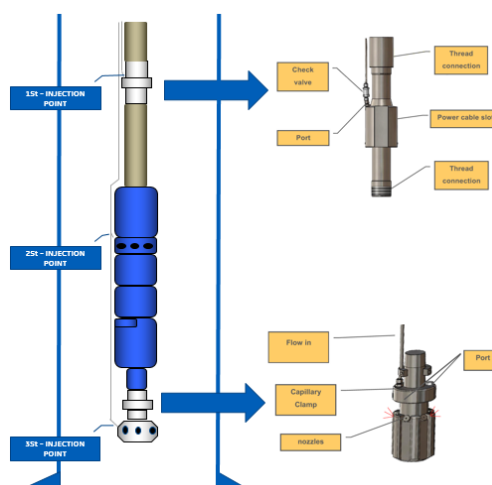
Challenge's Topic

Nodal analysis to optimize the chemical injection in extra heavy oil using new tools in Artificial Lift System with ESP.

Introduction

The objective is to carry out an analysis and research for use of a new mechanism to help in reduction of viscosity, increase the mobility of heavy oil, and finally optimize production in the Johanna, and Fanny fields of the Tarapoa Block in Ecuador.

There is a large amount of reserves of heavy and extra heavy oil in the Tarapoa Block of Andes Petroleum and BHGE has tested technologies such as ESP, ESPCP, during these tests we have encountered problems related to the reduction of temperature and increase in viscosity that usually begin about 2000 Ft under the Well Head, generating over pressures and plugging the tubing and loss of production.



The use of a tool with a BH patent is proposed to carry out the chemical injection in 2 scenarios, the first above the ESP located in the production pipe and the second with a completion under the ESP with stinger, for which the analyzes must be performed.

Scopes/objectives

- Analyze the use of chemical injection tools above the ESP, in the production pipeline and under the ESP through Nodal analysis simulations.
- Identify the depth in the production tubing at which the fluid mobility is a problem.
- Evaluate the VLP curves of fluid with injection vs fluid without chemical injection.
- Maximize the productivity of wells with high viscosity.
- Calculate the increase in torque that would occur due to viscosity effects.
- Reduce the axial load of ESP equipment.
- Increase the Run Life of the ESP lifting system.

Careers Involved

- Petroleum Engineering.
- Chemical Engineering.
- Mechanical Engineering.

Other Aspects

Knowledge in:

- Nodal analysis simulation.
- Sizing of electrosubmersible equipment.
- Fluid Mechanics.
- Behavior in high viscosity fluids.
- Chemical effects in high viscosity fluids.
- New technologies for lifting viscous fluids.