BeicipFranlab
An IFP group company

Internship in Reservoir Engineering

Summary

- **Length**: 4 to 6 months
- **Location**: 232 Avenue Napoléon Bonaparte, Rueil-Malmaison, 92500, France
- **Reference**: RP-2021-01
- **Starting Date**: March-December 2021
- **Internship paid and compliant with school conventions**

Job Overview

Title of the Internship:
Developing a workflow for a feasibility assessment of power generation from existing oil wells (Geothermal Energy from Oil Fields)

Intern profile:
Final year student enrolled in a master's degree program with an oil reservoir engineering, thermodynamic or geosciences option.

Objectives:
This internship will be performed in Beicip-Franlab with support from IFPEN (Rueil / Solaize).
The idea is to evaluate the potential of power generation from an existing oil & gas structure by exploiting the heat of produced fluids. A workflow will be developed integrating geology, infrastructure and the economic limits to select appropriate late-stage oil and gas wells and use them either as geothermal wells or co-heat-and-hydrocarbon producers. A decision risk matrix will be developed accordingly.

Main tasks undertaken during the internship:
The following data will be reviewed:

- Reservoir (and aquifer) model for a mature oil (and gas) field with a relatively high water-cut
- Well-head temperature measurements if available together with surface constraint including wellhead pres sure limit, maximum liquid and gas production capacity, etc.
- Thermal properties of the reservoir rock and fluids (these can be estimated from PVT and geothermal gradient)
- As many well tests as possible containing downhole temperature measurements during injection and production

First, the reservoir model, the historical injection and production data and the well tests results will be used to build and calibrate a thermal model representing the heat transfer from the surface to the reservoir and vice versa. The current thermal state of the reservoir will thus, be identified.
Second, late-stage producers with high water-cut will be identified. Their wellhead temperatures will be modelled and verified against the measured data (if available). Water injectors with a high injection capacity (and preferably coupled with the identified producers) will also be identified.
Third, predictions will be performed to obtain the maximum daily (or monthly) liquid production (and injection) rates from the identified wells together with target wellhead temperatures for the next 10 to 30 years. In the end, these data will be provided to an expert in IFPEN to allow an estimation of the potential of power generation at the surface. Ideally a carbon footprint of the process will be evaluated.

The internship will be supervised by two senior engineers and support from experts in Beicip and IFPEN.

Software used

- Eclipse, PumaFlow, etc
- MS Excel, VBA

Email to **erwan.perfetti@beicip.com / sebastien.charonnat@beicip.com**
Reference: **RP-2021-01**