Outstanding Operation Challenges in Polymer Flood EOR Project South Oman

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Abstract

Objectives/Scope: Massive polymer flood project in Marmul field south Oman was implemented since 2010 to enhance oil recovery. This project was effective in realizing volume incremental as an alternative of water flood secondary oil recovery. Managing stable operation procedure is essential to deliver injected polymer to the reservoir and sustain stable oil production. However, several operation challenges encountered during the past 13 years of polymer injection such as injection stability, pump uptime, polymer mixing ratio and viscosity stability which have strong impact in oil gain recovery. Currently the field complete phase 1 and phase 2 drilling stages while phase 3 on going which will used same polymer project capacity. Therefore, polymer injection optimization and maximizing polymer consumption in good pattern play a key role in increasing oil recovery in the field.

Methods, Procedures, Process: Recently the highest polymer oil gain was achieved since the beginning of polymer flood project life cycle. Oil daily rate improved to double comparing to previous years. This achievement was a result of many initiatives like data automation, improvements on troubleshooting, increasing polymer viscosity by using higher mixing ratio, sustainable polymer pump uptime and better equipment maintenance to reduce mechanical issues. Good collaboration between petroleum engineers, production chemistry and operation team also help to improve polymer flood performance significantly.

Results, Observations, Conclusions: Polymer injection uptime and the incremental oil gain are very well correlated. The higher the uptime, the more incremental polymer oil. Following a very careful and stable operational processes is necessary to manage successful polymer flood project. After overcoming most operation challenges, Marmul field phase 1 and 2 development polymer consumption increases significantly. This achievement led to significant improvements in the polymer utilization factor by around 50% and sustainable injection uptime up to 85%. In the planned field development, more than 400 infill wells will be drilled in phase 3 (2023-2026) therefore, achieving good performance of polymer injection and stable polymer pump uptime is very critical to advance the polymer recovery without polymer facility expansion.
**Novel/Additive Information:** This paper illustrates the successful initiatives that was implemented to overcome the operation challenges in Marmul polymer flood project which can be used in any similar polymer EOR project.