

Plunger Lift Dynamic Characteristics in Single Well and Network System for Tight Gas Well Deliquification

Yula Tang, SPE, Chevron Energy Technology Company

A study into plunger-lift characteristics to dewater the tight-gas wells was carried out to be able to understand the optimal operating conditions for reasonably controlling deliquification without a severe liquid surge while also maintaining a maximum gas production. Plunger lift is a form of intermittent artificial lift which uses a metal plunger to supply a solid interface between the gas and lifted liquid load. MBAL was used to capture the transient tight gas behaviour and linked to the network model in GAP:

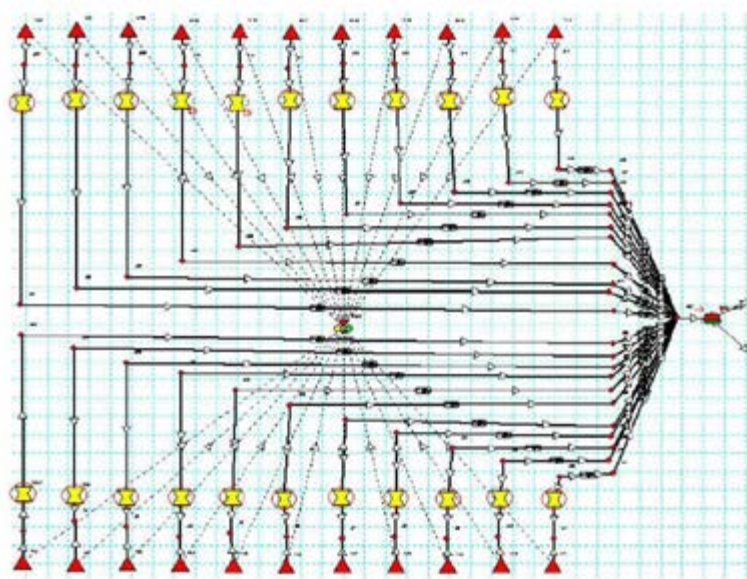


Fig. 4 IPM model for Piceance tight gas pad wells system

An investigation into the plunger lift effectiveness, performance and optimisation for multiple pad wells in the Piceance basin was carried out. Simulations were performed for 'early,' 'middle' and 'late' field life.

Conclusions:

- The study showed that liquid loading becomes severe and production becomes unstable with higher WGR.
- Plunger lift helps to mitigate the instability problem due to low pressure and liquid loading.
- It was determined that simultaneous plunger lift from shut-in conditions for multiple well-pads should be avoided as the resulting simultaneous start-up with plunger lift from shut-in conditions would flood the separator.