

Liquid Control

One of the two major [Well Controls](#) with [Lift Mechanism](#) trying to maintain the actual flowrate $q_L(t)$ manually specified value of the [flowrate](#) q_{LL} :

$$(1) \quad q_L(t) = q_{LL} = \text{const}$$

[Liquid control](#) is most common for [producing wells](#) with [SRP](#) and [ESP](#).

The mechanical pump is trying to maintain the target flowrate q_{LL}^\uparrow but it only succeeds when the wellbore fluid level is above pump location.

If dynamic fluid level lowers all the way down to the pumping chamber, then the pump efficiency deteriorates and the flowrate reduces:

(2)

while the fluid level and corresponding BHP are getting stabilized:

$$(3) \quad p_{wf}(t) = p_c = \text{const}$$

This value of BHP is called critical BHP p_c and the fluid can not be lifted at the wellbore pressures below critical BHP.

This does not actually qualifies the well operation as [Pressure Control](#) and the well is still under [Liquid Control](#) conditions and once [bottomhole pressure](#) raises above critical value the pump returns to producing the target liquid rate $q_L^\uparrow(t) = q_{LL}^\uparrow = \text{const}$.

See also

[Petroleum Industry / Upstream / Production / Subsurface Production Operations / Well Control](#)

[[Pressure Control](#)]

[[Liquid Control \(Reservoir Flow Modelling\)](#)]