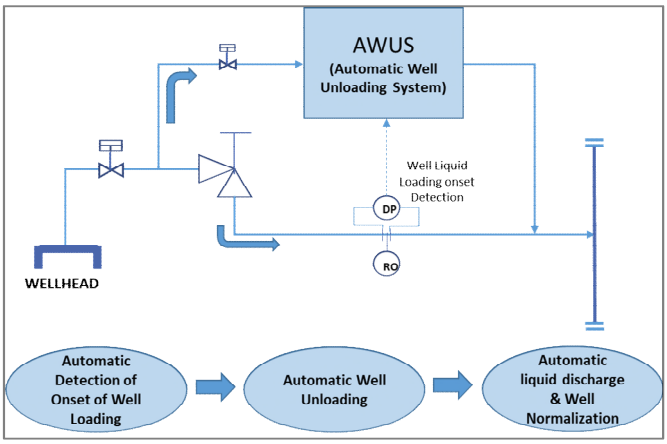
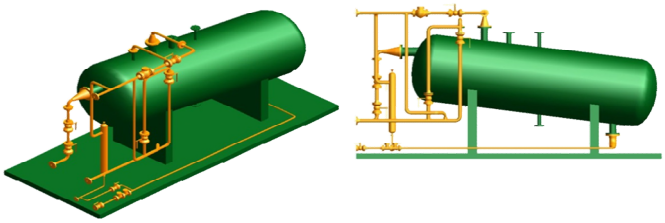
Creating Value Thru' Innovation

AUTOMATIC WELL UNLOADING SYSTEM (AWUS)



Automatic Well Unloading System (AWUS).

WEIGHT AND DIMENSIONS FOR 3.6m³ UNLOADING VOLUME (TYPICAL)	
300# Vessel (ID x L)	50" x 3.0m
Skid Dimensions (L x W)	2.5m x 4.0m
Skid Lifting Weight	5 tons



Typical 3D Model of AWUS

MAIN FEATURES AND BENEFITS

- Detects liquid loading at wells at onset
- Online and fully Automated System for detection of well loading condition, unloading of well and production normalization.
- No manning and no operator intervention
- No production losses and no flaring/venting
- Self-contained system (no external utilities)
- Low maintenance & complexity with no moving parts
- Compact & Light weight Package
- Easy to install with minimal tie-ins

ABOUT THE SYSTEM

During late life, liquid loading within wellbore becomes a common issue particularly for gas fields due to the depleting bottom-hole pressures. As the liquid builds-up within the wellbore, a liquid column head is created to a point where the bottom-hole pressure is insufficient to push any fluid out of the well. This ultimately results in cessation of flow from the well. NGLTech's patent pending Automatic Well Unloading System (AWUS) is a fully automated compact system that detects the onset of liquid loading within wellbores, unloads the well and normalize production without operator intervention, without venting/flaring and without production loss.

HOW IT WORKS

Consisting of simple static equipment with controls and instrumentations, the AWUS automatically performs well unloading upon detection of onset of liquid build-up in the wellbore using an algorithm based on differential pressure measurements at the well flowline. Onset of liquid loading detection ensures that production losses are minimized and unloading operation and reinstatement is done within minutes. Upon detection of the onset of liquid loading condition, the production fluid is directed to the AWUS which reduces the well Flowing Tubing Head Pressure (FTHP), thus enabling the liquids accumulated in the wellbore to be displaced to the liquid collection system within the AWUS. The liquid unloading operation is performed without the need for venting or flaring and without production loss. Once the liquid has been unloaded and well flowing pressure normalizes, the gas from the well will then push the unloaded liquids in the AWUS liquid collection system into the production header under its own pressure, thus eliminating the need for liquid return pumps. Throughout the sequence, the production header remains online and this ensures that the entire operation is done without disrupting production also from other wells.

APPLICATIONS

Gas wells that experience reduction or cessation of production due to decline in pressure and/or increase in water cut which leads to wells frequently experiencing wellbore liquid loading.

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