

# PERFORMANCE AUGMENTATION NETWORKS (PAN)

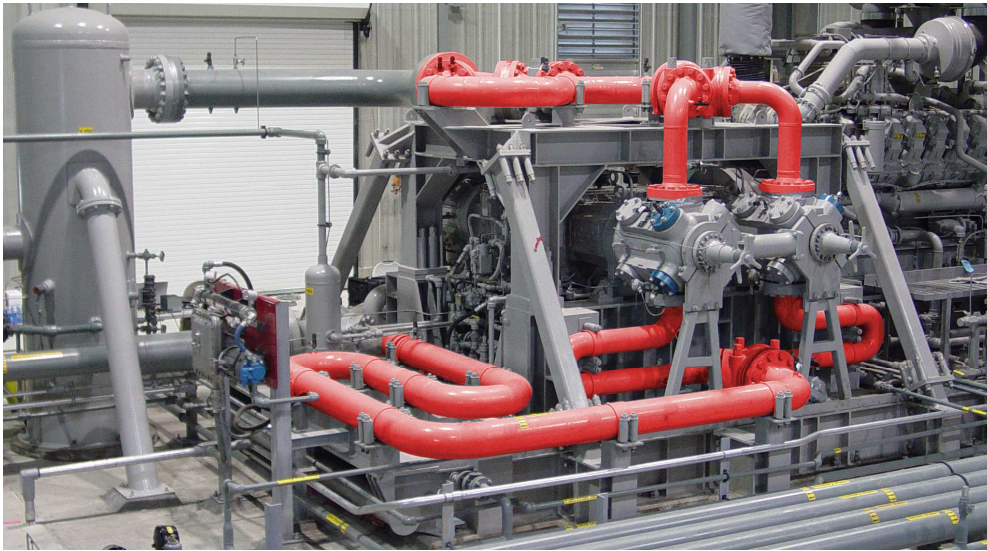
## PAN™ Hi-Performance Compressor Manifold

The Reliable Hi-Performance Alternative to Bottles

**OPTIMUM** - **ACI** Ariel JGT/4 Caterpillar G3516

### Midstream Compressor with PAN™ Hi-Performance Compressor Manifold

OPTIMUM created an optimized model-based design for this PAN compressor using its proprietary Virtual Pumping Station and Automated Design Software. ACI Services took this design spec and created a reliable midstream skid package for this popular Caterpillar/Ariel reciprocating compressor. The customer wanted more flow over a wide operating range (Suction 450-900psig and Discharge 1000-1200psig). The Gas Machinery Research Council co-sponsored the development of this PAN compressor package which was installed in November 2014 and there are now multiple working packages in operation.

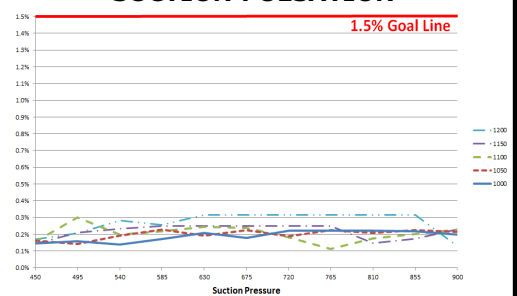


ENERFLEX Skid Mounted PAN Compressor Package

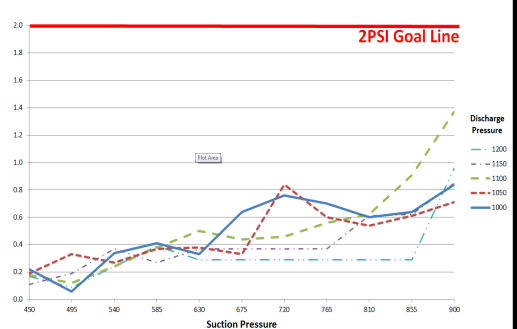
#### FIELD TEST GOALS:

- ❑ High Speed (~ 1400RPM)
- ❑ Pulsation to <1.5% of line pressure under all operating conditions
- ❑ 90% reduction in system pressure loss
- ❑ Vibration and stress levels consistent with API 618 M5 requirements
- ❑ 10% reduction in compressor BHP/MMSCFD at high flow operating condition (compared to bottle system)

#### PREDICTIONS: Goal < 1.5% SUCTION PULSATION



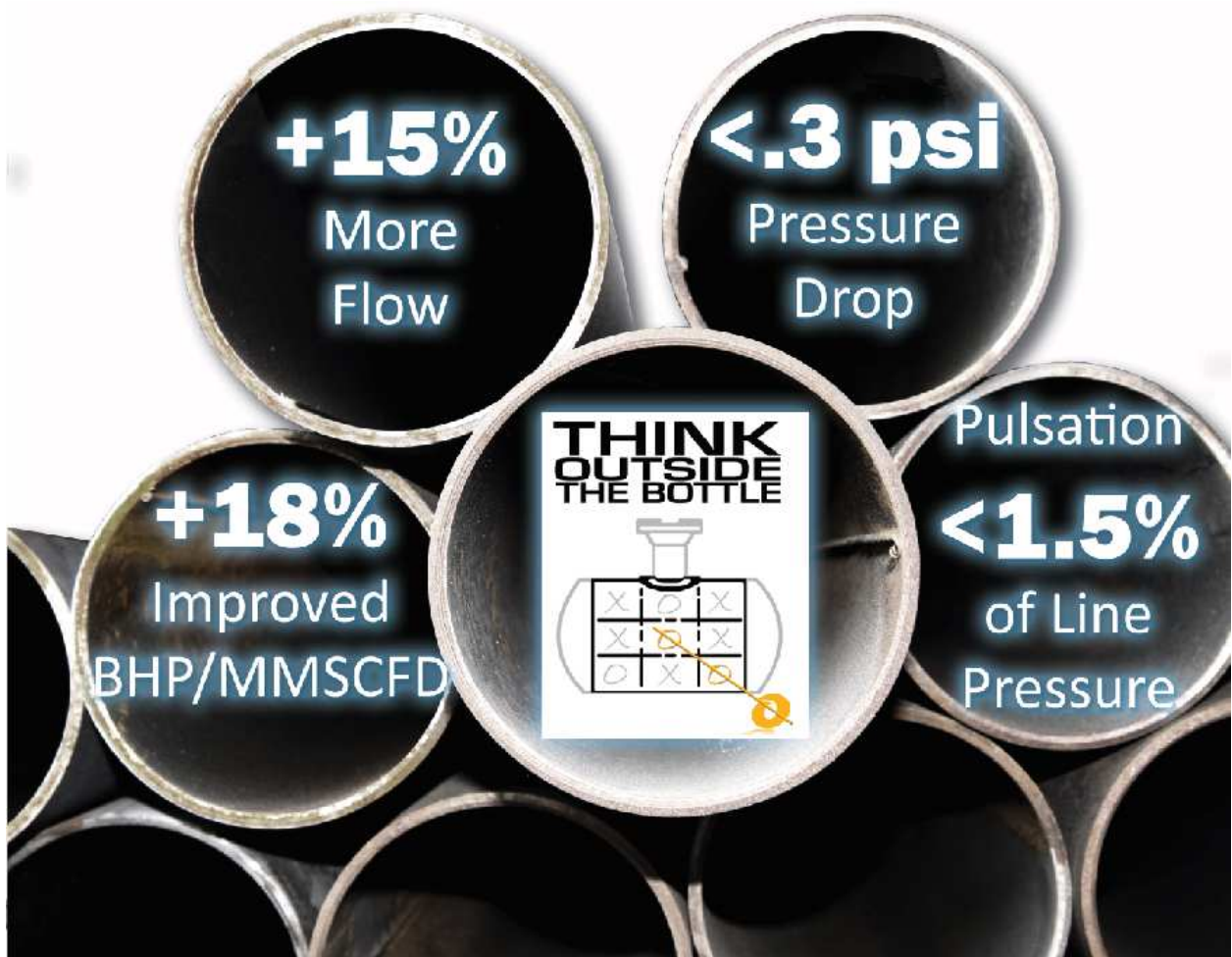
#### DISCHARGE PRESSURE LOSS



## Successful GMRC Full-Scale PAN Field Test Results

*PAN Technology has been the subject of the largest research project ever undertaken by the GMRC with participation from many industry leaders. These field tests of PAN technology employed redundant measurements by multiple parties to ensure accurate data collection.*

*This 600+ page report to the GMRC and 2015 GMC short course proves conclusively that PAN technology delivers on its promises.*



### Winner of the 2014 Shale Gas Innovation contest

- ✓ Pulsation Control
- ✓ Near-Zero Pressure Loss
- ✓ Greater Compressor Efficiency
- ✓ Greater Flow

**Why use bottles when a PAN system delivers better results?**



Bob Painter  
740-435-0240  
[sales@aciserviceinc.com](mailto:sales@aciserviceinc.com)



Roy Houston  
412-257-9070  
[sales@optimum-pumping.com](mailto:sales@optimum-pumping.com)