

CASE STUDY

HYDRAULIC RE-RATE ACHIEVES MAJOR COST AND ENERGY SAVINGS

- 20% reduction in operating costs
- 30% reduction in energy consumption
- ROI achieved in just over 12 months

CHALLENGE

The customer required a hydraulic re-rate of a third-party pump (Bingham 4x6x10B MSD) to new hydraulic conditions whilst maximizing efficiency. This particular pump was operating in parallel and feeding into a common header. Depending on tank levels and the number of pumps in operation, the customer normally operated the pump with the discharge valve approximately 60% closed to maintain the desired flow rate into the header.

The customer requested a cost savings analysis to justify the payback for the proposed re-rate.

SOLUTION

Initial values were taken for pressure, flow and power prior to the pump being pulled from the field and assessed for possible modification options. It became clear that the pump was too large for the application: consequently the customer had been throttling back the pump discharge for a number of years.

In most applications, excessive throttling of pump discharge pressure to obtain a necessary flow is a common waste of energy and can lead to increased vibration and mechanical failure over time. Depending on the type of throttling valve, the losses can be quite significant and often go unnoticed.

Our team explored a number of potential solutions, including destaging the pump or possibly slowing the speed of the motor using a Variable Frequency Drive (VFD). It was determined that the most cost-effective modification was to trim the impellers to match the desired flow and restore running clearances back to API 610 standards.



CLYDEUNION®
PUMPS

Industry: Oil & Gas - upstream

Region: Americas

Territory: USA

Category: Hydraulic re-rate

API Type: BB3

OUTCOMES

By trimming the impellers and restoring the running clearances, we were able to reduce the power consumption by more than 30%. This reduction in both head and flow allowed the customer to open the discharge valve, thus also reducing the power consumed across the valve. As a result, the cost savings analysis justified the re-rate, with payback in a little over 12 months.



Bingham 4 x 6 x 10B MSD

DESIGN INPUT		OUTPUT	
Flow (USgpm):	726.5	Previous BHP:	606.6
New head (ft):	2017.7	Equivalent KW:	452.1
Previous head @ condition (ft):	2493	Previous operating cost per month:	CA\$53,815.87
Specific gravity:	1.06	New BHP:	487.4
New Amp draw:	63	Equivalent KW:	363.6
Previous Amp draw:	88	New operating cost per month:	CA\$43,285.13
Monthly run time (Hrs): (24/7 continuous operation)	744	Operating savings after modification:	CA\$10,530.73
Price per KWH*:	CA\$0.16	Modification payback in months:	12.6
Previous pump efficiency:	80%	Modification payback in years:	1.05
New pump efficiency	80.5%		

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