



## Bingham 4 x 6 x 10B MSD hydraulic re-rate

**Industry:** Oil + Gas - upstream oil  
**Region:** Americas  
**Territory:** USA  
**Category:** Hydraulic re-rate  
**API Type:** BB3

ClydeUnion Pumps Aftermarket Technical Services team has experience across a range of services on critical rotating and reciprocating equipment to improve operational safety, reliability and efficiency. The hydraulic re-rate of the Bingham MSD pump for the oil and gas market is one of our success stories documented in our library of case studies. These case studies highlight the requirement from the customer, how we achieved the goal and the process we followed to deliver the improvements.

*Image left: Bingham 4 x 6 x 10B MSD*

## Situation

This project included a hydraulic re-rate on a Bingham 4x6x10B MSD to new hydraulic conditions whilst maximising efficiency. The customer requested a cost savings analysis to justify the payback for the proposed re-rate.

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 was determined the customer had been throttling back the pump discharge for a number of years and thus wasting energy. Various options were considered, including de-staging the pump or possibly slowing the speed of the motor using a VFD. It was determined the most cost effective modification was to trim the impellers and restore running clearances back to API 610 standards.



*Bingham 4 x 6 x 10B MSD*

## Challenge

Except for particular cases in heated processes, 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.

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. It was determined this pump was oversized for this application.

## Solution

By trimming the impellers and restoring the running clearances we were able to reduce the amp draw of the motor by over 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 payback in a little over 12 months.

| DESIGN INPUTS  |             |
|--|-------------|
| Flow (USgpm):  | 726.5       |
| New head (ft):   | 2017.7      |
| Previous head @ condition (ft):                        | 2493        |
| Specific gravity:                                      | 1.06        |
| New Amp draw:  | 63          |
| Previous Amp draw:                                     | 88          |
| Modification cost:                                     | CA\$132,699 |
| Monthly run time (Hrs):<br>(24/7 continuous operation) | 744         |
| Price per KWH*:  | CA\$0.16    |
| Previous pump efficiency:                              | 80%         |
| New pump efficiency:                                   | 80.5%       |

| OUTPUTS                               |               |
|---------------------------------------|---------------|
| Previous BHP:                         | 606.6         |
| Equivalent KW:                        | 452.1         |
| Previous operating cost per month:    | CA\$53,815.87 |
| New BHP:                              | 487.4         |
| Equivalent KW:                        | 363.6         |
| New operating cost per month:         | CA\$43,285.13 |
| Operating savings after modification: | CA\$10,530.73 |
| Modification payback in months:       | 12.6          |
| Modification payback in years:        | 1.05          |



P: +44 (0)141 637 7141 F: +44 (0)141 633 2399 E: cu.sales@spx.com

For more information about our worldwide locations, approvals, certifications, and local representatives, please visit [www.spx.com](http://www.spx.com).

SPX Corporation reserves the right to incorporate our latest design and material changes without notice or obligation. Design features, materials of construction and dimensional data, as described in this bulletin, are provided for your information only and should not be relied upon unless confirmed in writing.

Ref no: CS-BB3-G-OG-01 Rev no: 002 UK

COPYRIGHT © 2012 SPX Corporation