CASE STUDY
HYDRAULIC RERATE INCREASES PRODUCTIVITY AND REDUCING MTBO AT OIL REFINERY

- Hydraulic re-rate improves productivity
- Cavitation issue designed out, improving MTBO
- Change in customer approach following feasibility study accommodated

CHALLENGE
Our customer wanted to modify the hydraulic performance of two OH2 pumps (one running, one spare) for a gas oil pumping process in a refinery, according to new process conditions. The pumps already suffered intermittent cavitation phenomenon due to low available NPSH and it modelling had shown that the required changes in process conditions would lead to permanent cavitation problems.

The customer asked Celeros Flow Technology company ClydeUnion Pumps to perform an upgrade to meet the new rated point and solve the cavitation issue, with a 30 week lead time to carry out the pumps disassembly and modifications during a process shutdown.

SOLUTION
Calculations performed using the new process conditions identified that the OH2 pumps required an increase in impeller diameter to meet the new required flow for an unchanged head, as well as the addition of a specially designed inducer to avoid cavitation. These modifications were possible using spar parts available from the customer: but follow feasibility studies, the customer decided to order two new bare shaft pumps integrating the upgrades rather than modify the existing pumps.
OUTCOMES
The modified pumps are operating as planned, and capacity of the oil gas process has increased in line with customer expectations. The reduction in cavitation has led to an increase in MTBO, reducing maintenance frequency and cost.

FINANCIAL ILLUSTRATION
- **Investment**
  New motor, magnetic coupling, shaft, casing cover and lantern 25,000 Euros

- **Savings**
  - Cost of two new mechanical seals and multiple overhauls on one pump by year
  - Cost of damaged parts to replace
  - Costs linked to specific procedures for cleaning
  - Savings due to increased availability of the process