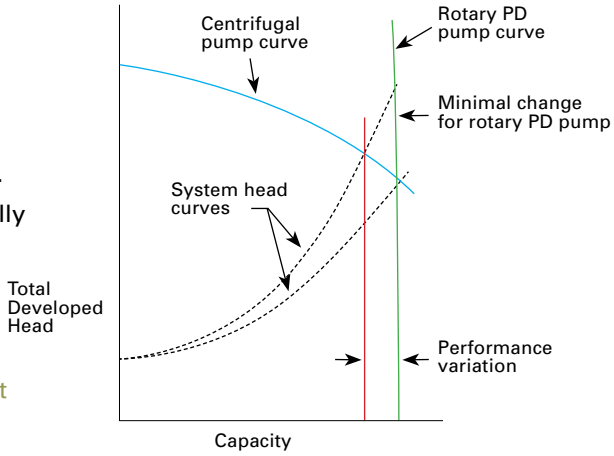
THE BASIS OF ROTARY POSITIVE DISPLACEMENT PUMP TECHNOLOGY

This is a tale of two pump curves in storage and terminal applications: one steadily bending downward from pump shut-off head, the other barely a curve at all. Both curves match two different pump technologies used in the oil & gas industry. Only one of those pump technologies can achieve certain critical objectives for reliably pumping hydrocarbons with highly variable fluid properties and under varying operating conditions.

The nearly vertical "pressure stiff" performance curve of rotary positive displacement (PD) pumps stems from a basic principle: As a volumetric fluid handling technology, rotary PD pumps create flow and are insensitive to system pressure changes. They deliver a nearly constant volume of liquid over a range of discharge pressures. If your flow or pressure demands change frequently, or even occasionally, on any given day, keep this fact in mind when selecting pump technology for hydrocarbons.



The PD pump's constant capacity or flow intersects the system head curve at a defined point. However, its flow performance is somewhat independent of this intersection point, allowing greater control over the process. This is why the pump curves pictured are so radically dissimilar. Rotary PD pumps don't develop head; they move flow. They fundamentally differ from centrifugal pumps in that:

- Their flow rate increases as fluid viscosity increases – an advantage when handling heavy liquid hydrocarbons.
- Their performance and pressure handling capability is not dependent on a fluid's specific gravity – a major advantage when utilizing a single pump for multiple process fluids in an oil terminal.
- A Best Efficiency Point does not govern their performance – that is, their reliability is not compromised from pressure variations throughout the process.
- They are usually self-priming and can pull almost a pure vacuum – making them excellent candidates for tank and pipeline stripping applications.

Thus the pictured vertical curve signifies only the slightest change in flow as pressure increases, which would typically occur due to a fluid's internal slip. The key operating objective of a PD pump is the control and balance of exactly that slip, achieved by designing set clearances between rotor and stator.

When constant flow is more important than constant pressure in your application … when reliable delivery of a product at a desired rate of delivery is your daily objective, even under changing process conditions … rotary positive displacement pumps are the answer.

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