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API 610 standard still forcing sub-optimal pump selection

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Strict interpretation of the API 610, now ISO 13709, pump standard is still restricting rated flow to a narrow band just to the left of best efficiency.

So says Oliver Brigginsshaw, managing director of pump developer Amarinth, warning that conflicting specs are leading to best pumps not being selected for oil and gas sector projects.

“API 610 has some contradictory statements relating to the preferred and allowable operating range and the position of the customer’s rated flow on the pump curve,” explains Brigginsshaw.

“Many supplementary specifications require their rated flow to be to the left of BEP [best efficiency point], which further limits the area,” he adds.

His advice: sticking to the standards does ensure highest reliability on high energy machines (motors above 300kW running at more than 3,000 rpm), where energy at the pump inlet and outlet are important. However, that’s not the case with smaller pumps.

“The rules are based on historical experience and data, derived over long periods and often on old design machines,” observes Brigginsshaw.

He refers to developments such as small rotor deflections obtained by low radial thrust hydraulic designs and stiffer shafts. “Such improvements mean that some of the rules may not be as applicable,” he insists.

Brigginsshaw draws attention to the allowable operating range in API 610, of 70–120% of designed BEP. “Most people think [these] are to make sure vibration limits are maintained and recirculation does not commence. But [they] vary from pump to pump.”

That matters with smaller pumps because, as Brigginsshaw says, “the standard unduly restricts

[them], as they can operate well within the vibration limits, but still be well outside the allowable 70% of BEP”.

It is also a matter of record that most pump manufacturers define a minimum flow for the unit and that can be as low as 15–20% of BEP – meaning that many pumps can operate very close to minimum flow, while still achieving API 610 vibration limits.

Brigginshaw is one among several now calling for a more flexible standard. “API 610 does recognise the limitations imposed on small pumps in the small print, but many [user] specs do not allow the flexibility to permit more appropriate selection.

“Perhaps the next revision could emphasise that, for lower energy pumps, a wider operating range ... would be acceptable – so long as the pump is deemed fit for purpose.”