Heart of the matter
An industry facing unprecedented challenges

Float like a butterfly
Valves that have proven to work in high temperatures
At the time of writing this opinion editorial, the world is in a state of change.

I started the month of March plugging away on planning committee activities for the Hydraulic Institute’s upcoming technical conference.

I was also a proud father of one (with another child on the way). In a few short days, I saw the arrival of my second son just before COVID-19 transformed into a global pandemic that would radically alter day-to-day life for my family, my team and HI’s community of pump engineers and experts.

Many of our member companies – and HI itself – have survived enough of history’s unprecedented challenges to know that this too shall pass. The world needs pumps like a human body needs a heart.

But as shelter-in-place ordinances go into effect across the world, our members, staff and governments are deliberating on the criteria that makes certain services and products essential to a functioning society.

And that got me thinking not just about the importance of pumps to our daily lives, but how we specify solutions against the criteria we believe to be essential.

At this moment, vodka manufacturers are retrofitting equipment to produce hand sanitiser and demand for the medical equipment and medicines derived from petrochemicals is skyrocketing.

Again, this too shall pass, but not before COVID-19 and its reverberations transform our notion to essential products, personnel, operations and resources.

When an old pump requires replacement, you don’t just swap it out with the same old model, ignoring all of the innovation, and changes to your operations that have transpired since that initial installation.

You apply updated criteria to the specification process. With these considerations weighing heavily on my mind – and two kids weighing heavily on both arms – it’s a good time to reconsider what qualifies as essential. Following is a checklist of important considerations to guide pumps election. Selection factors typically include process liquid, flow, pressure, size and power, efficiency, space capacity, reliability and cost. Some specifiers are also conscious of energy savings over time. However, it’s worth reframing the typical criteria with a new set of questions – especially amid the industry players that produce products that go into critical necessities for human health and functioning societies.

1. Approach the solution as a system – and with fresh eyes
Pumps are selected to meet system requirements, and not the other way around. In order to specify the right pump to perform in any application, it is inherently necessary to see the pump through the lens of the entire system. While there is critical value in tried and true solutions, engineers and decision-makers should take stock of every opportunity to improve performance, efficiency and reliability.

This could mean utilising smart pumps.
that integrate a Variable Frequency Drive (VFD) that has the pump performance programmed in from the factory, instead of retrofitting with a separate VFD. Both solutions reduce the pump speed to meet a designed set point for greater efficiency and cost savings.

However, the more conventional approach of utilising a separate VFD requires the additional leg work of installing the drive near the pump, installing instrumentation and connecting it, and programming the VFD, which can also create opportunities for error. So, don’t just default to what’s been done before. Instead of asking what will work, ask “what will work better?”

2. Consider the footprint
A frame mounted (pump has its own bearing frame), close coupled (motor bearings carry pump loads), or inline pump may be appropriate for an application based on power and speed requirements and the space available.

However, specifiers may be overlooking opportunities to condense footprint, potentially saving considerably on space and contributing to the overall cost of a pump system. Compared to frame mounted pumps, standard close-coupled pumps may be limited by 100hp–150hp but offer space savings of around 20%. Alternatively, the use of inline pumps where applicable can dramatically reduce footprint. Similar to valves, inline pumps are designed so the flow enters and exits on a single axis, requiring minimal floor space. As a result, inline pumps can occupy a third of the floor space a typical horizontal pump occupies. Just be sure to leave adequate vertical space for maintenance.

3. Think long-term about fluid properties and flow requirements
Engineers must take into consideration fluid viscosity and temperature when specifying pumps. Additionally, the presence of caustic chemicals as well as abrasive debris can result in the corrosion and erosion of pumps and pipes over time. All of these attributes inform the pump selection and performance of a system. In the current emergency situation, we also see manufacturers of some necessities having to ramp up. The makers of detergents, solvents, plastics and gels used across products in the medical and personal care fields may in turn, need greater volumes of petroleum-based olefins and aromatics. For these companies, it may be worth re-examining the flow rate and pressure ranges that control methodologies to grant them greater flexibility should the future bring similar scenarios.

4. Think about the pump technology
Centrifugal pumps are widely used and offer an advantage in many applications due to their flexibility in operation. However, some applications may do better with a positive displacement pump. For example, reciprocating positive displacement using pistons, plungers or diaphragms to deliver a consistent volume in every rotation of the shaft, can efficiently handle viscous liquids, and deliver an early consistent flow against low or very high pressures. These pumps can also be equipped with variable speed drives and dialled into a very precise flow rate. Some reciprocating pumps can have their stroke lengths varied to deliver a precisely metered volume without a speed adjustment. For this reason, reciprocating pumps are already often used in the industrial and petrochemical sectors and in many applications with viscous product.

5. Think in terms of total cost of ownership (TCO) and don’t discount energy efficiency
Specifiers who only think in terms of upfront cost are failing to see the longer-term potential for significant cost savings. For a typical pumping system, 65% of the TCO is related to energy and maintenance, while the initial cost only accounts for 10%. For example, a double-casing between bearing multistage pumps (BB5) will cost more than an axially split multistage pump (BB3), but the BB5 is designed for high reliability in high pressure and temperature applications. Trying to reduce cost upfront by extending the pressure and temperature range of the BB3 pump could result in a much higher TCO due to maintenance costs. Enhancing the energy efficiency of pumps can also go a long way to save on utilities. For select pump types that are below 200 horsepower, the HI Energy Rating Program (www. pumps.org/energyefficiency) is a resource to identify the most efficient pump that has been properly selected for the system requirements.

Hopefully, it won’t be long before COVID-19 runs the worst of its course and governments around the world implement effective treatments and eventually make a vaccine available. However, as we eagerly await the return of ‘business as usual,’ it’s worth taking stock of the things we want to change for the better. Stay safe and healthy

About the Hydraulic Institute (HI)
The HI centres the pump industry around excellence, efficiency and evolution to power everyday life. HI’s mission is to advance the pump manufacturing industry by becoming the world’s resource for pumping solutions and advancements in the industry by: Addressing Pump Systems, Developing Standards, Expanding Knowledge and Resources, Educating the Marketplace and Advocating for the Industry.

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