

# Practical Pumping

with Ross MacKay

Over the last half of a 40 plus year career in pumps, I've had the privilege of training in excess of 25,000 engineers and technicians in Pump Reliability. This has provided me the benefit of hearing the problems of that same number of pump users in the same period of time. From this experience I've learned 3 things:

1. Most pump problems are very practical.
2. Their solutions are also very practical.
3. Repetitive pump failure can be stopped.

The first of these comes as no surprise to most of you as you've been living with some very practical issues for a long time, such as;

- My pump isn't delivering enough liquid.
- It doesn't matter what seal I use, it fails every three months.
- We can't seem to stop the cavitation.
- etc.,etc.,etc.....

It's the second two lessons that may offer some surprise. Particularly if you are in the kind of plant where repetitive pump failure is causing ongoing problems like lost production, expensive downtime, environmental difficulties and excessive maintenance and operating costs...but it really is true. Most pump problems have very practical solutions and the repetitive failure can really be stopped!

So why do so many companies live with a pattern of repetitive pump failure? Well in my experience, it usually means one of three things:

- They *don't know* how to prevent their pump problems.
- They *don't think it's possible* to prevent their pump problems.
- They *don't want* to prevent their pump problems.

We won't waste any breath on the last group...other than to say that it does exist. A millwright in one particular plant told me quite openly that pump failure was sending his kids through college by means of the overtime it gave

him. Consequently, he wouldn't be trying too hard to prevent it!

Not knowing how to prevent pump failure is simply a matter of not having the necessary information. There's no shame in that. The only shame is in staying that way.

The reality is that, in many plants, not having information is normal because nobody gave it to you. That's my so many people think that their problems are inevitable and can't be prevented. That is not true!

The problem is frequently, "on the job" training. Or, if we can be more honest with each other, "picking it up as you go along". What little training that does exist is usually limited, frequently inaccurate, or is provided by the pump manufacturers who generally focus on how to take the pumps apart and put them together again. This is usually referred to as "Hands-on" training, and is extremely popular in spite of the fact that most millwrights can do this extremely well, simply because they've had to do it so frequently!

Hands-on training is very popular because everyone (including the maintenance department) just "knows" that the pump failed again because maintenance did something wrong the last time they fixed it.

Or did they...?

1. Which two pump parts are the most technologically advanced?
2. Which two pump parts are not covered by a warranty?
3. Which two pump parts are not manufactured by the pump company?
4. Which two pump parts are the ones that fail most frequently?
5. Why?

While anyone who knows their way around a pump knows that the answer to the first four questions is "seals and bearings", it's the last one that causes some hesitation, and no wonder. In most pumps, the seals and bearings act in a manner similar to the fuse in an electrical system. To a lesser degree, exactly the same thing will happen with packing.

Jus because the fuse fails, doesn't mean there is anything wrong with the fuse. In fact, most of us understand that the problem is almost always somewhere else. However, when a seal, packing of a bearing fails, we replace the offending part, resemble the pumps, and start up again. It is a very rare occurrence for us to look else where for the cause of the problem. We just fix the fuse.

In other words, we reinstall the same problem, and can expect to deal with it again and again, and again, throughout the life of the pump.

So how do we break this cycle of failure?

Well, one things we do not do, is to keep doing what we've always done up until now. It's been said that the most prominent example of insanity is to keep doing what you always done and expect different results. This doesn't work in the pump business any more than it odes anywhere else in life.

Not do we try about 4 or 5 things at the same time. Because if any of them does work, we still don't know which one was effective and therefore, we can't expect to repeat the success on the next occasion.

Simply put we can try and figure our where the real problem is and fix it. This is frequently referred to with the grandiose title of Root Cause Analysis, but let's now get too fancy with either the words we use of the things we try.

At the risk to detrimentally affecting my consulting business, you should know that the pump business is not nearly as complicated as many would have you believe. The only really difficult area is in designing the pump in the first place. Once you have it in your plant or mill, all you have to do is operate and maintain it within certain predetermined parameters and there will be no problem.

The one challenge is that the majority of pump failures are actually initiated outside the pump. It could start somewhere in the system, wither because of poor hydraulic design, or poor mechanical design and layout of the pipe work. It could also be a mounting or alignment problem, or even the manner in which the entire system is operated. The result is that we need to be aware of more than just the pump itself. We

also need to know how to install and operate the pump properly.

If I'm ever accused of being too simplistic, I will happily plead guilty because, for every pump problem you will ever experience, there are on 6 possible solutions. Do it can't be that difficult.

Or can it?