Ross MACKAY Associates Ltd.

Can't Find the Forest for the Trees

by Ross Mackay

Can't Find the Forest for the Trees.!!

To one degree or another, we've all done it! We've found ourselves so far into the trees, we can't find the forest. In other words, we get too close the problem to identify a logical solution.

On one occasion, I overheard a discussion on the merits of having a new pump supplied with a stainless steel bearing housing. The logic offered was that an acid was leaking from a valve above the proposed location of the pump. The leak would land directly on the pump bearing housing and cause considerable corrosion damage. This discussion ranged back and forth for quite a while before someone inquired, "Why don't we stop the leak!".

In a similar vein, a group of pump people in a Discussion Group at the Pump Symposium in Houston a few years ago were heavily into a discussion of how to alleviate the pump problems being caused by the strain from a misaligned piping system. Once again, this discussion went on for some time before someone suggested the very practical solution of correcting the misalignment.

Some time ago, three highly placed engineers spent their valuable time writing an article for a magazine to offer the pumping community their expertise in a new approach to pump reliability. Their premise was that too much time and trouble had been spent on mechanical and operational methods of reducing pump failure. They suggested a hydraulic design approach that would be more effective. At the end of a very well researched and well presented discussion, the conclusion was twofold.

1. Operate the pump closer to it's best efficiency point, and

2. Operate the pump at a slower speed.

Quite apart from the fact that these two conclusions both seem like operational factors to me, anyone who has been around pumps in the field for any length of time is fully aware of the practical benefits of operating close to the B.E.P., and at slow speeds. We did not need a new way of considering pump reliability to tell us this. Nor did we need a new model to support it.

If a valve is leaking, fix it! Don't focus on the damage the leak is doing. Correct the problem..... not the symptom.

If piping is misaligned and causing pump failure, realign the piping and the pump failure will stop.

When a pump is operated close to it's best efficiency point, there are fewer energy losses in the pump. That's what high efficiency means! The pump will run in a more stable condition and therefore will use less energy and also waste less energy.

There is also an inverse relationship between the rotational speed of a pump and the life of the bearings. When bearings fail less frequently, the pump is more reliable!

While theoretical models are essential to the continued development of the pump business, we cannot afford to lose sight of the practical situations. Most of the time, pump problems are caused by poor installation, clumsy operation, or unthinking maintenance.

One major challenge in pump reliability is created when a problem has been tolerated for so long that it becomes a "normal" condition, and no-one even thinks about the fact that it may be unusual and could be improved.

A typical example is the pump in a high temperature acidic service where the seals and bearings fail every 5 weeks, but the engineer wouldn't even consider a new pump/seal combination because the 12 month

guarantee offered was too far beyond his comprehension and belief for that service.

Then there is the fertilizer plant where they start every pump and let it run for 5 or 10 minutes before they open the discharge valve..... "just to let it warm up before we put it on line"...!!

On the other extreme, there is the paper mill where every pump is dismantled and overhauled, with the seals and bearings changed every 6 months as a method of preventive maintenance. Effective but expensive.

Part of the problem is that most pump users assume that their pump suppliers are the the fount of all knowledge and wisdom, and know everything necessary to enable the pump to operate in that service. I really wish that were the case.

About 20 years ago I moved from the supply side of the pump business, to the user side. On reflection, it was more a slow change in attitude and approach than a change of environment and employer. I simply stopped looking at the pump as an isolated piece of machinery, and started to view it as part of a production system.

From my earlier position as a supplier, the pump was very much complete within itself. The only thing someone else had to do was to install it properly and run it correctly, and the pump was able to provide exactly the head and capacity for which it was purchased. Of course, if it wasn't operated at the design condition, that was not the supplier's fault and one could not reasonably expect the pump to perform reliably under different conditions.

My current perspective is neither better nor worse than my old viewpoint, it is simply different! In my earlier days as a pump salesman, I was supplied the anticipated operating conditions of a pump and accepted them without question (even if questions had been tolerated!). I then proceeded to select a pump from a group of characteristic pump performance curves that most closely reflected the required conditions. When the sale was made, and the pump was manufactured, tested, shipped and accepted, the file was closed. In other words, when the pump supplier's job was finished, the end user's job was just beginning.

It must not be assumed that the brevity with which I describe this transaction implies any careless or frivolous attitude towards the whole process on the part of the pump suppliers. Nothing could be further from the truth. The point is, that the function of the pump supplier is to supply a pump that pumps "x" gallons a minute at a total head of "y" feet of a specific liquid at a certain temperature. When it has been established, either by site or shop tests, that this has been accomplished, then their job is complete.

Now the pump user takes over.

The good news is that the vast majority of pumps are installed and run well for a reasonable period of time without any unacceptable incident. However the true quality of a supplier should not be judged when things are going well, it's when things start to go wrong that we test their true mettle. This is true whether we're discussing a pump, a car, or a vacuum cleaner.

When the supplier hears about a pump that keeps failing, he has a problem pump on his hands, and probably an unhappy customer.

When an end user is faced with a pump that keeps failing, he is not just faced with a problem pump, he may have a complete system that is no longer operational, resulting in a loss of revenue caused by a reduced output of a profitable product. In addition, the end user is acutely aware that every dollar that is spent on maintaining this pump is being deducted directly from the bottom line profitability.

Ross MACKAY Associates Ltd.

The question is, are we so wrapped up in our own area of responsibility that we are neither aware of (or possibly even concerned about?) the ramifications that our decisions and actions may have on others in the loop?

Are we so wrapped up in bearing housing corrosion that we ignore the valve leakage?

Are we so concerned about pump failure that we forget about the reason it's failing?

Do we get so wrapped up in theoretical models that we are unaware of existing field practices?

Let's not get so far into the trees that we can't find a forest. The easy decision may not always be the right one in the long term. By taking one step back from the problem and considering the bigger picture, the real solution is frequently easier to identify.

Ross Mackay specializes in helping companies reduce pump operating and maintenance costs through consultation and education.

Ross Mackay Associates Ltd.
P.O. Box 670-PMB-29, Lewiston, NY, 14092
4 Simmons Crescent, Aurora, ON, Canada L4G 6B4
Tel: 1-800-465-6260 Fax: 1-905-726-2420
Email: ross@rossmackay.com
Web Site: www.rossmackay.com