

 The Machine Minder

"I thought the computer did the maintenance but now it wants ME to go and buy a can of oil!"

Maintenance strategies—what's in fashion now?

Whilst cynicism may not actually be part of the genetic make-up of tannery engineers, it is nevertheless deeply engrained in their psyche. The reason is perhaps not too hard to find: whilst other trained and skilled engineers are sitting in air-conditioned control rooms, drinking coffee and studying computer print-outs, the tannery engineer finds himself underneath a smelly fleshing machine, trying to understand what combination of carelessness, wilful stupidity and just possibly mechanical failure is causing damage to the hides.

Little wonder that they cast a jaundiced eye on the latest ideas that are supposed to transform their jobs.

Over the years, maintenance engineering has encountered a series of messianic movements, which, it is trumpeted, will transform effectiveness, reduce costs, and of course permit further de-manning. Planned maintenance, predictive maintenance, terotechnology (or how to optimise the manufacturing part of an organisation), condition monitoring... each is espoused by earnest, clean-faced young men usually purveying expensive computer-based systems. If they gain a convert at senior management level, the works engineer is presented with a system that will take months to set up and is largely inapplicable to his industry sector, who is told to go away and reduce costs. Fitters and mechanics are often quite enthusiastic—the more perceptive amongst them can foresee

more time spent at the desk and computer screen, and less at the mucky end with tools in their hands. But the poor old engineer receives the latest tablet of stone with a heavy heart; once all the fancy wording and superfluous items have been stripped away, the company has yet again been sold a package of common sense. Perhaps, thinks the cynical old engineer, common sense is now like bottled water—the fancy bottle and the marketing must *surely* make it better than the old stuff out of the tap...

This article is then, perhaps, more for the benefit of the general manager than the tannery engineer. There is some merit in most of the maintenance strategies espoused in the glossy brochures, and it is largely a question of selecting what may be appropriate to the particular circumstances of the tannery, or even to a particular machine group, and applying it with sufficient resources. Once your engineer realises that you are not going to impose a system on him, dialogue and co-operation in proposing and implementing a maintenance improvement programme may well follow.

Weighing up the options

First, an important point that is sometimes overlooked—in a computerised maintenance system the computer *does not actually do any maintenance*. It simply programmes and records what the maintenance staff do; the purchase of a computerised system ➤



MAINTENANCE STRATEGIES—WHAT'S IN FASHION NOW?

does not, therefore, mean that fewer bodies will be required in the maintenance department. It is more likely that more will be initially required to deal with the maintenance backlog that such a system can highlight. Maintenance systems are usually introduced to counter frequent breakdowns and poor machine availability, and these are often the result of cost-cutting and de-manning to achieve short-term financial targets. Improvement in performance is achieved by improved maintenance; there are many means and strategies that can and should be employed, but they are probably going to require the input of more resources.

Now, a second important point—an essential building block of any maintenance strategy is simple, regular cleaning of machinery by production staff. It is impossible to see if parts are getting worn or oil is leaking if the machine is covered with smelly muck, and it is a demoralising waste of resources to expect a mechanic or electrician to have to clean down a machine before they can even look at it. Operators should be responsible for the cleanliness of their workplace, including their machines. It is true that sometimes the more zealous have to be stopped from hosing down electrical cabinets and power washing the grease out of bearings, but this is a more preferable problem than neglect. Often such keenness can be turned to advantage by making the operator responsible for the lubrication of his machine after cleaning.

Choosing a strategy

A simple common sense strategy that is often overlooked, but which has a real value, is 'run-to-failure'. If an item of plant or machinery is easily replaced and causes minimal disruption if it fails, then *make sure a replacement is to hand* and run it until it fails; the work of changing a light-bulb is the same whether you allow it to fail or not, the consequences of failure are usually slight, and maximum value is obtained by using it for its whole life. At the start of maintenance planning, it is important to identify which items you can afford to treat in this way—it is, however, looking for trouble if you allow such items to select themselves by default.

Next on the list of strategies is 'planned maintenance', which is usually taken to mean maintaining machinery to a pre-planned



An essential building block of any maintenance strategy is simple, regular cleaning of machinery

programme to minimise unexpected failure. This can be done with a paper-based system, but use of a computer and printer to prompt work, generate the work instructions and store the records of work done is now almost universal. Good, competent engineers in the past will certainly have adopted planned maintenance, at least for the most important plant items in the tannery, but will probably have kept the schedules in their heads or in a notebook. Introduction of a planned maintenance system into an unplanned situation invariably requires a sustained input of maintenance time and expenditure on spares, perhaps for a year or more, before improved machine availability is proven. The biggest obstacle to successful implementation is normally access to production machinery during the working week—it is pointless scheduling a week's worth of planned maintenance if the only time that production machinery is released is on Saturday morning. This is the main reason for such systems failing—a huge backlog of work accumulates and the engineering staff conclude that the exercise is pointless. Senior management must give a priority to planned maintenance and communicate this to production staff all down the line.

Any good planned maintenance programme should be constantly reviewed and modified to suit changing production



Predictive maintenance involves regular scheduled and detailed inspection of a running machine (SPM Instrument)

MAINTENANCE STRATEGIES



situations. Engineering staff should be empowered to modify maintenance schedules if common sense shows that they are no longer appropriate. It is pointless replacing a bearing if you know full well that the machine has only run for a couple of days since the last replacement. Most planned maintenance systems are calendar based, but there is a strong argument for fitting 'hours run' meters to all machines and carrying out the schedules on this basis.

Predicting problems

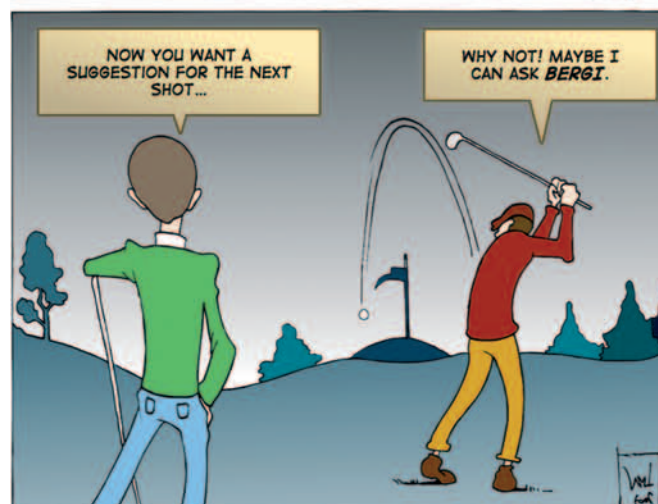
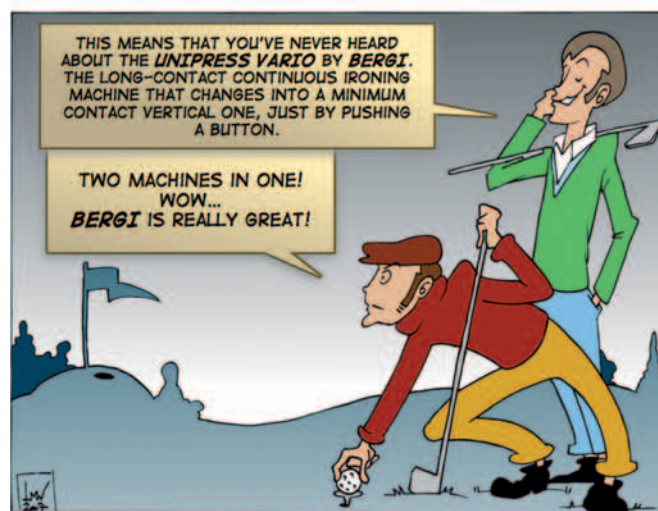
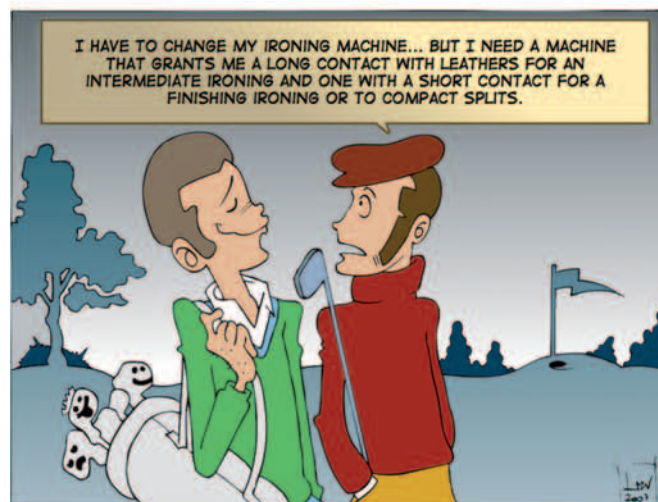
A strategy that may be viewed as a hybrid of run-to-failure and planned maintenance is 'predictive maintenance', sometimes known as condition monitoring. This involves regular scheduled and detailed inspection of a running machine with a view to predicting the likely failure of components and replacing them just before they do. This maximises the working life of components and minimises spares expenditure. It is often used for large, critical machines where planned maintenance schedules are difficult and lengthy—large drum drive units, for example. Such drive gearboxes are difficult to access and require a great deal of effort to open up and visually inspect, but failure is inevitably costly in lost production and damage to leather. What is needed is to monitor the condition of the bearings and the internal gear teeth without having to strip the unit down. The condition of the bearings can be measured using an electronic shock pulse measurement instrument, which is the technological development of the engineer putting a screwdriver on the bearing and putting his ear to the handle.

When originally introduced, these instruments gave vibration readings in different frequencies which were recorded and plotted to give predicted life to failure, but they have now been considerably simplified. The vibration and shock pulses from the bearing are now analysed internally by the instrument to give a simple green/red indication as to whether the bearing now requires replacement. As the instrument is handheld and portable, only one or two are required to cover all the machines in the whole plant.

As with all strategies, common sense needs to be applied, and systems which look good to senior management but have little real value should be avoided. It is easy to keep up with inspection and monitoring of items that are easily accessible, but it is often the items which are hard to get at that are the most vital and prone to failure. Inaccessible bearings can be fitted with permanent extension probes, to which monitoring instruments can be applied safely from outside guarding.

Another tool for condition monitoring is lubricating oil testing. In the case of a big drive gearbox, a very small sample of lubricating oil is drained from the casing and sent for analysis, normally by the lubricant manufacturer or supplier. They can test the oil for viscosity, additive breakdown, contamination, etc., to predict when it will need changing, but they can also detect metal particles in the oil which are an indication that the gear teeth are wearing or breaking down. This procedure is often carried out at annual shutdown for vital items of plant and can also be used for the oil in vital hydraulic systems.

Lubrication should be an essential part of any maintenance strategy. There are two normal schools of thought—the first says that it should be the operator's responsibility and the second says that it should be the mechanic's responsibility. It's a swings-and-roundabouts decision—operators will generally grease and oil more often, fitters will generally lubricate more thoroughly, often as part of a maintenance schedule. An alternative strategy is to employ a single specific person to oil and grease all the machinery in the tannery to a regular schedule, on a ►

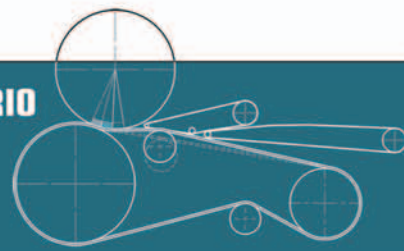


BERGI

www.bergi.com
info@bergi.com

UNIPRESS VARIO

Variable-contact
ironing machine





MAINTENANCE STRATEGIES—WHAT'S IN FASHION NOW?



Handheld instrument for testing of machine bearings in operation (SPM Instrument)

part-time basis if necessary. If the right person is selected, a semi-retired fitter for example, they can be valuable as the eyes and ears of the maintenance department, reporting anything untoward that they see on the machines before real trouble occurs. If equipped with a bearing test instrument they can be even more valuable!

Made-to-measure

In conclusion, therefore, a maintenance improvement strategy for the tannery will probably be better if it is made-to-measure rather than 'off the peg', particularly if the maintenance staff have had a hand in the measurements. Consider all the various approaches, and use the most appropriate for particular groups of machines—one blanket strategy for everything is seldom appropriate. By all means use the latest in technology, such as handheld bearing testers, but don't see any single new development as the answer to everything. Remember that a computer is just an electronic diary and notebook, and doesn't actually do any work itself. Understand from the outset that a new maintenance strategy to improve machine availability will initially require more expenditure, not less, and that the savings will take time to materialise. And always remember that whatever the glossy brochures of the fresh-faced young men say, maintenance engineering is not rocket science, it is a blend of common sense, persistence and hard graft. 🌐

T.M.M.

We Know. We care

Suppliers of fine wet blue grains and splits, as well as hand selected raw hides to please the most demanding customers.



RHÖM ALPINA

S.r.l.

**WET BLUE GRAINS & SPLITS
RAW CATTLE HIDES - CHEMICALS**

Via San Francesco D'Assisi 22 - 10121 Torino (TO) - Italy
Tel / Fax: 39-011-1989-0534 - Email: info@rhom.it

+49 61 23 / 698-222
www.krautzberger.com

Krautzberger
...a cut above the rest!

- Spray guns
- Coating systems
- Material feed containers
- Lifting devices
- Pumps
- Regulators/valves
- Ventilation technology
- Accessories

100
100 YEARS
OF KRAUTZBERGER

Krautzberger