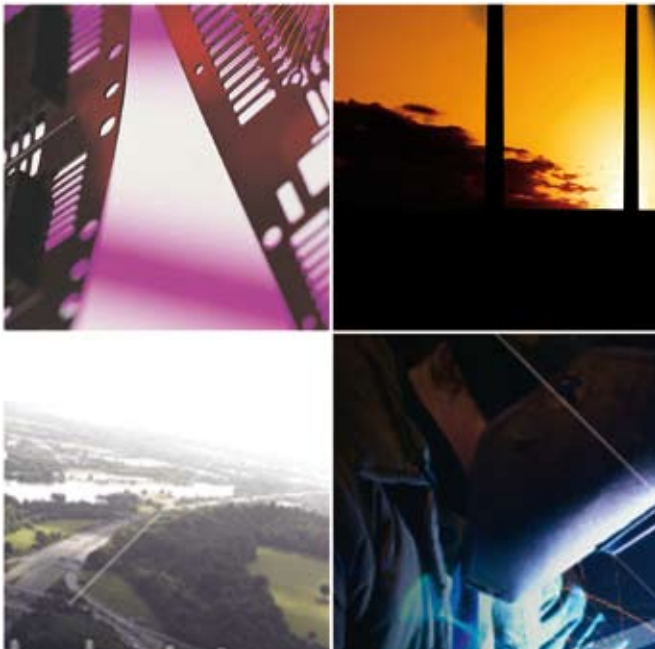


# RELIABILITY OF PRODUCTION- THE MAINTENANCE LINK

The continuous efficient performance of all physical assets in any production facility is essential to ensure the economic survival of the business, writes John Coleman



This performance is necessary to allow the company meet the requirements of its customers, and to limit lost production opportunities, while remaining compliant with all Safety, Health and Environmental requirements. It is the fundamental base of all production facilities, regardless of size. The maintenance goal at all times must be to provide the production side of the business with equipment that is reliable, running efficiently, and producing a quality product.

## Proactive maintenance

Achieving this requires a proactive maintenance strategy that is targeted at maximising uptime and minimising equipment failures. This must be achieved while recognising that all equipment is inherently designed to fail. This need for uptime of equipment, particularly with facilities running at 100 per cent of their capability can easily result in the fostering of a very reactive-type maintenance regime. As this mode of working becomes more established, the planned and scheduled work falls behind, resulting in more emergencies and the spiral increases until the whole situation is out of control and equipment uptime is dropping daily.

In a situation such as this, the maintenance function is

costing the company profit and swift action is required to bring about change. Turning the situation around once the 'reactive' mode has been reached takes significant effort. The situation requires a new mindset and strong leadership with clear goals to get to a stage where maintenance is proactive. It is possible to move to a very proactive state by implementing a well structured integrated and comprehensive approach to reliability and uptime. I mention 'reliability' and 'uptime' separately because while they are inextricably linked, it is possible, in my opinion to have a very reliable machine with a high percentage of downtime.

The improvement strategy can be defined under the following headings:

1. strategic analysis of equipment current condition and performance;
2. the creation of strategy targeted at maintaining and improving equipment performance;
3. analysis of people requirements – skills, training;
4. the effective execution of the defined strategies;
5. development of relevant key performance indicators (KPIs);
6. utilisation of relevant tools to evaluate performance and effectiveness of strategy; and,
7. review and revision strategy allowing adjustment of overall maintenance strategy to match changing business needs.

The implementation of any strategy should follow the format of Develop/ Execute/Evaluate/Revise/Execute. This is a continuous process and does not end after the first or subsequent evaluations. Each evaluation must take into account the development that has gone before and the current business needs. This continuous process should ensure that maintenance is working in harmony with the production plant and contributing to the overall profitability of the operation.

## Overall strategy

In setting out the overall strategy a clear master plan of action is required. This plan must indicate what groups must/need involvement and an overview of how it will be developed, executed and reviewed.

A time frame for each should be set down with a clear target date for 'roll-out' agreed as soon as possible. It cannot be stressed enough that the involvement of all stakeholders from the outset is critical to achieving the final goal. Different stakeholders will have varying levels of involvement, some may not even want to be involved, however all must be invited in and briefed regularly on the development process.

Each section of the strategy requires different activities leading ultimately to the execution of the strategy.

Items for consideration during the development process should be:

- how progress on development will be communicated to all on a timely basis;
- equipment condition now;
- design of equipment (consider ease/speed of maintenance);
- criticality in the production process;
- spares inventory – (lead time, cost, shelf life);
- regulatory compliance;
- tools for analysis and recording;
- purchasing strategy; and,
- human resources – craft and operator skills needs analysis - (remember it is the operator who will ultimately work with and operate the machine).

Items for consideration during the implementation process should be:

- ‘roll out strategy’ - if the plant is in a highly reactive emergency mode it will take significant effort over the first couple of months to break out of that cycle;
- statutory requirements;
- preventative maintenance routines;
- routine maintenance repair tasks (correct information available);
- operators role in maintenance;
- condition monitor programme;
- work scheduling and measurement;
- recording of relevant information; and,
- KPI records and publication

Items for consideration during the review process should be:-

- how well the strategy was communicated to all;
- effectiveness of the strategy – emergency work reducing / reliability improving;
- KPI review – relevance of KPIs;
- ease of availability of the best information to the most relevant person doing the job;
- production volume/quality on target;
- stakeholder involvement; and,
- next step – adjustments to strategy.

As with any change there will be significant challenges for the change managers. People in general do not like moving from their ‘comfort zone’ and so most will initially, at least, be resistant to anything which is likely to impinge on that. In addition to that, there will be the challenge of choosing the best tools to fit the strategy for your plant. There are literally hundreds of methodologies to consider for developing maintenance and physical asset strategies. Some of the more popular choices include reliability centred maintenance (RCM), total productive maintenance (TPM) and risk based inspection (RBI). Many of these systems are well proven, however great care should be taken before stepping totally into any such system. These systems are often highly complex, despite what their facilitators say, and any maintenance manager should research the subject matter well before taking the final step.

### Research

In most cases if a maintenance manager takes the time to define what maintenance is required on the physical assets of the facility it is possible to produce a strategy that fits better than any ‘bought-in’ system. There are several good books written on the subjects of RCM, TPM etc. and some research

will help generate a maintenance overview that suits your facility at minimum cost.

As the strategy rolls out it will be important to continuously reinforce the message to all. People very easily get wrapped up in the problem issues of ‘today’, without any reference to the criticality of the equipment in the production train. It is important to focus on the impact of equipment failure to ensure people are working on the most relevant issue at any given time.

To improve on asset performance in any production facility, effective and timely evaluation of data is critical to ensure informed decisions are made. However data is useless unless adequate tools are available to analyse it. It is only by automating data retrieval so that it becomes information, and interfacing it with critical maintenance, production and condition monitoring systems, that equipment performance improvement becomes an achievable objective. For many businesses taking the next step in maintenance will not be achieved by working harder, but by working smarter.

New processes will require acceptance and company cultures will need to evolve. The strategies of yesterday will not suffice today, and today’s strategies will not suffice tomorrow. Constantly strive to close the gap between the way things are and the way they could be.

As the organisation moves from reactive to proactive, the opportunities for improvement will expand. People will have more opportunity to ‘think ahead’ and improve on the equipment condition. This forward thinking becomes even more critical as businesses begin to reduce inventories. It is important to develop a sense of partnership with all groups within an organisation. Each operator can contribute as much to reliability and uptime as any maintenance person, by identifying issues early.

Finally, many maintenance organisations see production as their ‘customer’. This situation often leads to a situation where everybody thinks the situation is somebody else’s problem. As employees, at any level in the organisation, be very aware, that there is ultimately only one customer. The only customer that matters is the purchaser of the manufactured products. Each person working in the organisation is contributing to the quality and profitability of that product and the better the communication and co-operation between individuals and groups, the greater the profit margin will be. Φ

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