

Maintenance Management: Challenges for South Africa

Advertorial

Many physical assets in South Africa such as power stations, process plants, smelters and building infrastructure are aging and require continued maintenance and refurbishing to keep them in good working condition. Some of these assets are now 40 to 60 years old and maintenance effort and cost is increasing as the age of the system increases. All technical systems have a specific design life, or useful life, and a decision has to be taken at some time whether it is still cost effective to keep the system running, or whether it is more cost-effective to phase out the system.

Maintenance is not, or should not be, a dirty word in any organisation. All human-made assets degrade with time, and astonishingly quickly in some situations. Why then do some CEO's and other top-level managers not understand that the strategic plan, operations plan, marketing plan, quality plan and budgets of the business enterprise should incorporate maintenance of the assets of the enterprise?

Ever since humans started to construct infrastructure assets, e.g. buildings, roads, bridges, etc., maintenance was necessary to ensure that the assets could last a few decades or even centuries. There are several examples of marvelous structures like the York Minster, Notre Dame, in Paris and St Paul's Cathedral, in London, to name a few, that need a constant and huge effort in maintaining the stones, roof tiles and windows. The 300-year old St Paul's Cathedral will be restored and refurbished in the next few years at a cost of £40-million. It is a never-ending job and the older the building gets, the more intensive the maintenance that is required.

Back to the current situation in South Africa. Various degrees of neglect by provincial governments and local town councils have left many rural roads in a terrible state where it is quite dangerous to use the road in bad light conditions. Vehicles are frequently damaged by deep potholes that sometimes develop overnight, especially during and after heavy rains. Effective maintenance of roads requires

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frequent monitoring of the condition of the road and speedy repair when degradation is above predetermined levels. Deferring this basic repair nearly always leads to more extensive repairs at a much higher cost. The old proverb "prevention is better than cure" is very much applicable in maintenance.

Lack of preventive maintenance on electrical assets like transformers is quite noticeable to the general public in terms of the availability of electricity supply both at work and at home. Frequent power failures in cities like Johannesburg and Pretoria has led to severe disruption for many companies, and possible damage to equipment such as air conditioners. The cost of repair after failure of a technical system like a transformer is much higher than the cost of preventive maintenance and replacement of subsystems.

The big question now is, is there a "magic formula" for effective management of the maintenance of a technical system or physical asset? All maintenance managers probably realise that there is no magic formula or optimum solution that will work for all technical systems. But, there are a few basic principles that will increase the odds of a successful maintenance operation. At the heart of maintenance planning is a proper strategy for selecting a maintenance tactic for a specific component or item of the technical system. Methodologies like reliability-centred maintenance (RCM) or business-centred maintenance (BCM) are well suited to address this problem of choosing the right maintenance tactic.

There are four fundamental tactics that are generally used for each component or item, i.e.

- Operate to Failure (OTF), or Failure-based Maintenance (FBM)
- Use-based Maintenance (UBM), or Fixed Time Maintenance (FTM)
- Condition-based Maintenance (CBM)
- Fault-finding Maintenance

In general, one would expect that the original equipment manufacturer (OEM) would provide the necessary information to the end user for making a correct choice. For example, the car manufacturer would inform the owner that the oil and water levels should be checked weekly and that the tyre pressure should be checked once a month. The manufacturer would also indicate that the oil and oil filter needs to be changed every 15 000 km, etc. With a maintenance plan, much of this hassle is taken care of by the service station and the owner should just remember the intervals of service.

Unfortunately, not all equipment manufacturers provide the necessary information to make an informed decision, and the maintenance manager or engineer must fall back on basic principles. This involves a sound knowledge of the failure characteristics of a particular component and some data on the deterioration or degradation characteristics of the component. Sometimes this information can only be determined through actual failures on the plant.

Selecting a wrong tactic could have dire consequences for a maintenance manager and department. An unwanted failure of a component might lead to unplanned downtime and loss of revenue, but in some cases it could also lead to catastrophic consequences with a serious leak of process gas or fluids, or cause serious injury or fatalities, e.g. if an explosion occurs or if huge kinetic energy is suddenly released.

Maintenance and asset managers in South Africa need the right skills and theoretical background to manage technical assets effectively. Proper training and development of these managers is therefore essential to be successful in any organisation. South Africa desperately needs world-class maintenance and asset managers to become and remain internationally competitive.

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