Right Maintenance Strategies-A Must for Efficient Mill Operations

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ABSTRACT

Maintenance management can be better termed as Physical Asset Management. Asset Management helps maximizing output, equipment reliability, cost reduction and contribution to the economic growth of the company. An attempt has been made to understand how Asset management contributes in this area. Also, use of OEE [Overall Equipment Effectiveness] as measurement tool for measuring success of Asset management, impact of failure on product quality, industries reputation and society on the whole are discussed. Emphasis has been laid on reducing Mill blindness and building a highly motivated maintenance team which can deliver results as per expectation of management and change the mindset that maintenance team is a cost centre and not a profit contributor.

INTRODUCTION

Over the last ten to fifteen years, maintenance has become increasingly technical and central to the profitability of a manufacturing enterprise. Equipment availability must be at or close to world-class values in order to compete in a commodity market.

PHYSICAL ASSET MANAGEM - -ENT NOT MAINTENANCE MANAGEMENT

The goal for any plant is to increase overall production reliability, meaning the maximization of output with current resources by reducing waste in equipment reliability and process reliability. While process reliability will primarily relate to the production processes, equipment reliability will come under the domain of maintenance management. Lack of equipment reliability creates waste due to failing components, quality losses for reasons of equipment problem or speed losses because of component wear or breakdowns. Reliability improvements to eliminate the needs for maintenance are essential and the only way to permanently reduce cost. Preventive, condition based and pro-active maintenance must replace reactive maintenance on failure. Effective work planning and scheduling is mandatory. The precedings are all easy statements but difficult to implement. Increasingly the term "Maintenance" is being replaced by the term "Physical Asset Management".

The years 2003 and 2004 have been water-shed year for importance of Physical Asset Management. Four major events took place in the western world, which have lent new importance to Management of Assets.

1. The disaster of space shuttle Colombia.

2. 24 hours power outage in New York in August 2003 where hundreds and thousands of people were stranded. Similar but shorter term outages took place in United Kingdom and Italy.

3. Four charges of manslaughter were dropped against people incharge of maintaining and managing the railways in United Kingdom in response to Hatfield train disaster. Thus again starting a debate regarding "Corporate Killings".

4. Enactment of legislation in Canada to impose criminal liability on business and individuals in the event of work place accidents.

These four events brought home the fact that any equipment failure can have a wider social ramification and can lead to legal implications for the persons responsible for management of such an equipment.

Asset management as with all functional sections of an organization needs to contribute to the economic growth of the company. Over the past few years, there has been a great increase in the levels of understanding regarding exactly how Asset Management is able to contribute to this area? More than any other time in the history, we are dependent on machinery to perform many industrial tasks. Many tasks, which were earlier performed by people, are now being performed by the machinery, especially as the levels of automation have increased. While this has been responsible in dramatic increase in productivity levels, it has also placed considerable pressure on direct cost of mill maintenance. As we move forward in 21st Century, direct cost of maintenance is increasing due to more emphasis on safety, complexity of machines, increasing cost of spare parts, man power and capital equipments. But organizations are under pressure to control these costs in a manner that not only these are effective but also sustainable over the medium and long term. The challenges are manifested in three areas in particular.

1. Minimization of life cycle cost of asset ownership.

2. Minimization of direct cost associated with maintenance.
3. Minimization of cost associated with new asset purchases and asset renewal programme [Overhaul and Renovation]

Therefore, any maintenance strategy should necessarily include the following.

1. Reliability-centred maintenance.

2. Preventive maintenance optimization.

3. Root cause analysis.

4. Total productive maintenance.

5. Planning and Scheduling.

6. Availability modeling.

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7. Decision support tools.

LET US MEASURE OEE NOT UPTIME ALONE

In practices, the success of any maintenance or asset management system can be measured in terms of a term "OEE" [Overall Equipment Effectiveness] rather than only the uptime. The OEE or overall performance of a single piece of equipment or even at the entire factory will be governed by three OEE factors - availability, performance rate and quality rate. OEE is a percentage derived by multiplying three ratios for the factors mentioned above, or in other words:

OEE = Availability x performance rate x quality rate.

While availability obviously is the uptime percentage, performance rate can be defined as of actual percent efficiency achieved as compared to rated efficiency of the machine. Quality rate can be defined as percentage of saleable goods out of total production per time frame. This overall equipment effectiveness will give a fair idea of how efficient or inefficient the mill maintenance system is ? A benchmarking can be done over a period of time based on industry best practices both at national and international level.

PLEASE DO NOT BE MILL BLIND

For making a mill maintenance system successful, we must avoid the phenomenon of "Mill Blindness". When we go round the shop floor, do we listen to our motors complaining about overload ? Do we see our pump packings crying a flood ? Do we hear our bearings whine about contaminated lubricants ? Do we notice our steam system that coughs excessive condensate and it complains about strained elbows ?

There are two types of people in mills. There are people who notice when equipments show signs of distress and people who do not. We often call people who do not see signs of distress in equipment "Mill Blind" People. The mills blindness may not be intentional but rather a product of being so used to the environment that poor equipment condition just is not noticed. Leaking rotary joints are so common in many paper mills that they have become accepted over the years. A new employee in paper machine is told that leaking rotary joints are normal and that leaks cannot be detected before steam is coming out of joints.

Similarly spare parts storage can have a huge impact on the level of planning and scheduling of maintenance jobs and the reliability of equipment, but we often forget the direct reliability impact of incorrect management of spare parts.

Some spare parts are perishable with or without use like rubber or plastic material such as V-belts, couplings and O-rings. It is common to find these materials continued to be stored even after their useful life is over due to long storage. Proper storage of bearings is often missing in the mills where bearings are kept unwrapped in dusty store rooms. Impact of vibrations in the storage area is ignored which causes fatigue damage especially to bearings fitted in equipments, like motors and pumps because the bearing balls keep tapping the outer bearings race.

LET US BUILD UP OUR MAINTENANCE TEAM

Last but not the least, it is imperative to give maintenance its due importance in any organization including recognizing the efforts of the maintenance staff. Maintenance is the "thankless job" as often repeated by us. Many a times it is true that we do not appreciate the efforts of the maintenance team as we can not get their direct results like the sales showing their numbers, production showing their targets achieved and crossed. Maintenance data is recorded, presented and analyzed but it is viewed and understood only whenever the production or sales targets are missed due to some failure of the machine. In other words, we try to understand the maintenance data with negative approach only to understand its impact on the business loss. This popular perception that maintenance is a cost centre is not true. Maintenance is a profit contributor that generates production capacity. It requires an attitude of professional excellence and promotion of its corporate value. To find their rightful place in the organization, maintenance managers will have to change their attitude, viz.

1. My job is only to fix the machine.
2. I do not have to care what production thinks about my performance.
3. I do not need to know how to use a computer, I know how to turn a wrench.
4. Why should they care about the way I look or dress as long as the machine works.

Rather they should treat the user department as their customers and internal customers do not care how much you know until they know how much you care. To show you care is to be :

a] **C**redible customers need assurance the job will be done right.

b] **A**ttractive-sloppiness opens up questions of overall quality.

d] **R**esponsive-when the machines are down, the company looses potential revenue.

e] **E**mpathetic-put yourself in your internal customers' shoes.

Highly motivated and enthusiastic maintenance team can deliver results, which are unbelievable and are the ones, which every organization expects from them. Maintenance team can contribute to OEE [Overall Equipment Effectiveness], safety, high productivity, ergonomics, [elimination of fatigue for operators] and also to saving in direct cost and maintenance cost. So let us recognize the efforts of the maintenance team and salute them for upkeep of our valuable resources.