BEST MAINTENANCE REPAIR PRACTICES

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IN PARTNERSHIP WITH:
THE MAINTENANCE COMMUNITY BY UPKEEP

A number of surveys conducted in industries throughout the United States have found that 70% of equipment failures are self-induced. Maintenance personnel who are not following what is termed 'Best Maintenance Repair Practices' substantially affect these failures. Between 30% and 50% of the self-induced failures are the result of maintenance personnel not knowing the basics of maintenance. Maintenance personnel who, although skilled, choose not to follow best maintenance repair practices, potentially cause another 20% to 30% of those failures. The existence of this problem has been further validated through the skills assessment process performed in companies throughout the US. This program evaluated the knowledge of basic maintenance fundamentals through a combination of written, identification and performance assessments of thousands of maintenance personnel from a wide variety of industries.

The results indicated that over 90% lacked complete basic fundamentals of mechanical maintenance. This article focuses on "Best Maintenance Repair Practices" necessary for maintenance personnel to keep equipment operating at peak reliability and companies functioning more profitably through reduced maintenance costs and increased productivity and capacity.

The potential cost savings can often be beyond the understanding or comprehension of management. Many managers are in a denial state regarding maintenance. The result is that they do not believe that repair practices directly impact an organization's bottom line or profitability. More enlightened companies have demonstrated that, by reducing the self-induced failures, they can increase

production capacity by as much as 20% and thus lower maintenance and total cost. Other managers accept lower reliability standards from maintenance efforts because they either do not understand the problem or they choose to ignore this issue. A good manager must be willing to admit to a maintenance problem and actively pursue a solution.

You may be asking what are the "Best Maintenance Repair Practices". Here are a few which maintenance personnel must know:

Best Maintenance Repair Practices

Maintenance Task	Standard	Required Best Practices	Consequences for not following Best Practices	Probability of Future Failures> Number of Self-Induced failures, versus following best practices
Lubricate Bearing	Lubrication interval – time based ± 10% variance	1. Clean fittings 2. Clean end of grease gun 3. Lubricate with proper amount and right type of lubricant. 4. Lubricate within variance of frequency	➢ Early bearing failure – reduced life by 20-80%.	100% > 20 vs. 1
Coupling Alignment	Align motor couplings utilizing dial indicator or laser alignment procedures. (Laser is preferred for speed and accuracy) Straight edge method is unacceptable.	1. Check runout on shafts and couplings. 2. Check for soft foot. 3. Align angular 4. Align horizontal 5. Align equipment specifications not coupling specifications	➢ Premature coupling failure. ➢ Premature bearing and seal failure in motor and driven unit. ➢ Excessive energy loss.	100% > 7 vs. 1
V-Belts	Measure the tension of v-belts through tension and deflection utilizing a belt tension gage.	1. Identify the proper tension and deflection for the belt. 2. Set tension to specifications	➢ Premature belt failures through rapid belt wear or total belt failure. ➢ Premature bearing failure of driven and driver unit. ➢ Belt creeping or slipping causing speed variation without excessive noise. ➢ Motor shaft breakage.	100% > 20 vs. 1

Hydraulic components	Hydraulic fluid must be conditioned to component specifications.	1. Hydraulic fluid must be input into the hydraulic reservoir utilizing a filter pumping system only. 2. Filters must be rated to meet the needs of the component reliability and not equipment manufacturers specification. 3. Filters must be changed on a timed basis on based on filter condition. 3. Oil samples must be taken on a set frequency and all particles should be trended in order to understand the condition and wear of the hydraulic unit.	➢ Sticking hydraulic. ➢ Premature or unknown hydraulic pump life. ➢ Sustaining hydraulic competency by maintenance personnel. ➢ Length of equipment breakdown causes lost production.	100% > 30 vs. 1

Looking through this abbreviated “Best Maintenance Repair Practices” table, try to determine whether your company follows these guidelines. The results will very likely surprise you. You may find that the best practices have not been followed in your organization for a long time.

In order to fix the problem you must understand that the culture of the organization is at the bottom of the situation. Everyone may claim to be a maintenance expert but the conditions within a plant generally cannot often validate that this is true. In order to change the organization’s basic beliefs, the reasons why an organization does not follow these best practices in the repair of their equipment must be identified. A few of the most common reasons that a plant does not follow best maintenance repair practices are:

1. Maintenance is totally reactive and does not follow the definition of maintenance, which is to protect, preserve, and prevent from decline (reactive plant culture).
2. Maintenance personnel do not have the requisite skills
3. The maintenance workforce lacks either the discipline or direction to follow best maintenance repair practices.

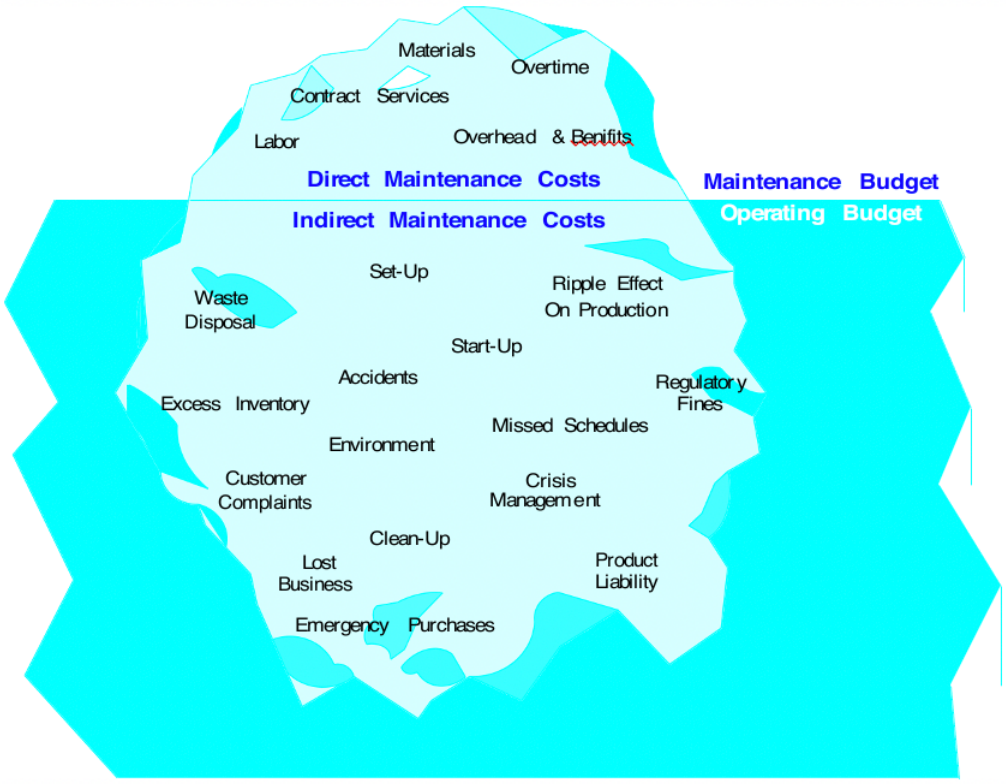
4. Management is either not supportive, and/or does not understand the consequences of not following the best practices (real understanding must involve a knowledge of how much money is lost to the bottom line).

In order to solve the problem of not following "Best Maintenance Repair Practices" a sequential course of action should be taken:

1st: Identify whether a problem exists (i.e. Track repetitive equipment failures, review capacity losses in production and identify causes for these losses, measure the financial losses due to repair issues). See the Nyman Iceberg diagram below.

Maintenance Cost Iceberg

Source: Industrial Machinery Repair, by Keith Mobley and Ricky Smith



2nd: Identify the source of the problem (this could be combination of issues).

- Maintenance Skill Level – Perform Skills Assessment (written and performance based) to evaluate whether skill levels are adequate to meet "Best Maintenance Repair Practices" for your specific maintenance organization.
- Maintenance Culture – Provide training to all maintenance and management relative to a change in maintenance strategy and how it will impact them individually (i.e. Increase in profit for the plant, less overtime resulting from fewer equipment breakdowns, etc.). Track and measure the changes and display the results to everyone.
- Maintenance Strategy – Develop a plan to introduce a proactive maintenance model with Preventive and Planned Maintenance at the top of planned priorities. This will provide more time for performing maintenance utilizing the "Best Maintenance Repair Practices".

> *Maintenance means to protect, preserve, and prevent from decline - both equipment and team culture.*
>
> - RICKY SMITH, CMRP

3rd: Implement the changes needed to move toward following Best Maintenance Repair Practices" and measure the financial gains.

To conclude, as many as 75% of companies in the United States do not follow "Best Maintenance Repair Practices". The 10% that do follow these practices are realizing the rewards of a well run, capacity driven organization that can successfully compete in today's and tomorrow's market place. Remember that use of the "Best Maintenance Repair Practices" might just become a mandatory requirement for the future success of an organization in today's economy.

Join me for a three-day workshop on 'Best Maintenance Technician Practices' - more info below.

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