

MAINTENANCE STRATEGIES

Maintenance is the routine and recurring process of keeping a machine or asset in its normal operating condition without causing any loss of time on account of accidental damage or breakdown.

Maintenance objectives:

- Maximisation of availability of eqpt
- Safe working conditions for personnel
- Prevent breakdown during operation
- Elimination of future defects
- Maximise operational^{e^{-λt}} efficiency
- Reduce idle hours
- Reduce maintenance cost
- Enhance performance level
- Forestall rapid wear of components

Types of Maintenance systems:

- Breakdown Maintenance
- Planned Maintenance

Planned Maintenance can be subdivided:

- Scheduled Maintenance
- Preventive Maintenance
- Corrective Maintenance
- Condition based maintenance
- Reliability centered Maintenance

Breakdown Maintenance:

The required repair is performed after occurrence of a failure. This type of maintenance is oldest. It is also known as run to failure maintenance (RTF). Two types

- Emergency maintenance
- Breakdown Maintenance

EM is carried out as fast as possible

BM is useful where the failure is unpredictable. Expensive in terms of cost.

Time based maint is done to avoid breakdown failures.

Planned Maintenance:

- Work planned beforehand to avoid failures
- Work study carried out to find out periodicity of maintenance work
- Prepare optimal maintenance schedules
- Optimal utilisation of facility
- Working conditions i.e. humidity, temp etc
- Detailed instructions for carrying out the job

Preventive Maintenance:

PM is performed before failure of an item.

British standard 3811:1993 defines PM as

The maintenance carried out at predetermined intervals and intended to reduce probability of failure or degradation of an equipment.

- Adequate no.of staff required
- Suitable production eqpt and machinery
- Staff qualification and skills requirement
- Mngt support
- PM to be planned and scheduled
- Ability based

Types of PM:

- Routine Maintenance
- Running Maintenance
- Opportunity Maintenance`
- Window Maintenance
- Shutdown preventive Maintenance

Design out Maintenance

- Design of eqpt should be such that it requires no or minimal maintenance work
- Provision to send periodic feedback on performance to designer for necessary modifications,if any.
- Proper training tp maintenance workforce.

- Predictive Maintenance:

The aim of this maintenance is to identify critical parameters of an eqpt to monitor for corrective action.

Predictive maintenance helps in pointing out potential failures well in advance

Critical parameters like vibration, temperature pressure etc can be recorded and signature obtained for future evaluation of performance

TOTAL PRODUCTIVE MAINTENANCE

TPM is a philosophy of continuous improvement that creates a sense of ownership in the operators and other connected persons for machine as well as their operators.

In productive maintenance operating people are also involved in maintenance of their equipments.

Operators look after daily and routine maintenance and call for maintenance group only in case of major breakdowns.

Introduced by General Electric, USA IN 1960.

When this concept is extended to all employees of the plant including materials men, quality men and others, it is called total productive maintenance

FEATURES OF TPM:

- Aims at maximising over-all effectiveness of plant eqpt and assets
- Involves all depts i.e.operation,maintenance, Plg,material mngt,quality etc
- Participation of top mngt to workmen level
- Has a total system of complete maintenance covering entire plant cycle
- Promotes small autonomous group concept for better motivation