

Chapter one: Introduction to maintenance



By: belay A .

Titles to be covered:

- ✓ *definition*
- ✓ *Functions*
- ✓ *Maintenance expectations*
- ✓ *Factors of evaluation*
- ✓ *Improvement and modification of equipment*
- ✓ *Choice of maintenance*

maintenance/repair

Maintenance/ repair is an action or actions to retain or restore the desired (required) state , as well as to asses and determine the actual state of technical means of a system.

Maintenance may be defined as the chronological activities or as the process of systematic activities done for keeping the m\c or equipment at the heat level for well run or its proper services.

AIMS OF EFFECTIVE MAINTENANCE

- To maintain machine equipment at the maximum operating speed and production efficiency.
- To ensure the best possible level of quality of the product.
- To minimize the idle time resulting from machinery breakdowns.
- To reduce to a minimum the cost of maintenance consistent with the above objectives.

Functions

Primary Functions:-

- Maintenance of Existing Plant Equipment
- Maintenance of Existing Plant Buildings and Grounds
- Equipment Inspection and Lubrication.
- Utilities Generation and Distribution
- Alterations and New Installations

Function...

Secondary Functions

- Stores keeping
- Plant Protection (guards or watchmen; fire-control squads)
- Waste Disposal
- Salvage.
- Insurance Administration
- Other Services

Well organized maintenance department has

6

- ❖ **Good plan** :- maintenance is a process planned based on the existing facts of the organization.
- ❖ Well **studied** and **balanced man power**.
- ❖ **Adequate** maintenance **tools** and **equipment**.
- ❖ **Adequate space & time** to do repair and maintenance work.
- ❖ Well **equipped** and **systematically controlled** maintenance **store**.etc.

Maintenance expectations

- Having well **organized** and **properly performed** maintenance one can expect the following out comings or benefits.
 - ☐ Increase in productivity of labor
 - ☐ Increase in quality of products
 - ☐ Minimize operation cost
 - ☐ Less man power
 - ☐ Less spare parts used
 - ☐ Minimize power consumption
 - ☐ Safe working condition

Factors of evaluation

- **Performance**: Machines must be capable of performing the function for which they are intended.
- **Down time**: Machine down time must be at an acceptable level
- **Service life**: Machine must provide a satisfactory return on investment before replacement become necessary.
- **Efficiency**: Machine must operate at an acceptable level of efficiency

Cont....

- **Safety** : Machines must operate safely and not dangerous for personnel
- **Environmental impact** : Machines must operate in a manner that is not detrimental(harm full) to the environment or to adjacent plant or equipment.
- **Cost:** The cost of maintenance must be acceptable.

Improvement and modification of equipment.

- Maintenance is not only repair or planned preventive action but also improvement and modification of equipment.

Why do we need modification?

The two major reasons to do modification are:

- Continuous improvement of equipment operational or technological capacity.
- Repeated and registered failure on particular part or parts of a machine.

❖ Modification includes:

1. Changing of **materials** (example: steel to cast iron)
2. Changing of **mechanisms(modification)** (motion transmission from pulley to gears)
3. Changing of **properties** of materials to increase their wear potential.(using different treatment)

Choice of maintenance

12

