UNIT - V REPAIR METHODS FOR MATERIAL HANDLING EQUIPMENTS

Material Handling Equipments (MHE)

* Material Handling equipment is mechanical device for handling of supplies with greater ease and economy.

* MHE refers to various material handling equipments like carts, hand trucks, fork lifts, Conveyors and also not limited to shelf pickers motorized pallet jacks, tractors and other specialized industrial trucks powered by electric motors or IC engines.

Need for Maintenance of MHE.

* MHE eases the usage of manual handling and enhances operational efficiency.

* In todays economic climate of high labour and capital cost, unexpected machine failures and malfunctions can seriously and negatively impact Company profits.

* MHE needs to be maintained to provide long uninterrupted service.

* This also reduce the cost of expensive repairs as a result of a breakdown or unnecessary wear, enhanced productivity dueto less m/c downtime and reduction in the potential for personal injury.

Maintenance strategies for Hoists and Cranes.

i) Portable Cranes

* It is necessary to keep loads within design limits on portable cranes that are mounted on wheels or wheeled platforms.

* Frequent inspection of brakes, load hoisting and lowering mechanism.

* Inspection of boom, base and platform for any sign of stress e.g: Cracks, bends, breaks.

ii) Overhead Cranes.

* keep the attachments in overhead cranes loaded within the rating capacity.

* Maintain safety factors for replacement parts according to manufacturer's specifications.

* Examine over speed sensing/stopping mechanisms, brakes and clutch, sheaves, pins, gears, cables, hooks, rails, etc.

* Check welded connections for cracks, bends, abrasion and corrosion.

Stages of Preventive Maintenance for Cranes

i) Inspection:

All parts, open or covered are inspected for wear and tear, worn out or unworkable components like wire ropes, wheels, bearings, bolts etc. are removed. Brakes are adjusted and necessary lubrication applied.

ii) Repair:

The repairable parts of the system after inspection are corrected for small repairs and minor defects are rectified. Systems like open gear transmission, couplings, riveted and bolted joints, trolley, brakes, guards, etc. may be repaired according to the needs.

iii) Overhaul

Overhauling involves dismantling the complete mechanism and replacing all damaged components. Crane structure, buffers, rails, open gear transmission, pulley blocks, etc. may be replaced and various sub mechanism may be aligned and adjusted to ensure smooth operation.

Maintenance Strategies for Conveyors.

* Conveyor Systems need to be inspected on a regular basis. The important areas include rollers, bearings, chains and belts. All of there moving Parts are subject to wear and tear.

* check Conveyors to detect any belt slippage, dragging or defective rollers.

* Be sure that all necessary gaurds are in place to protect Workers from mechanical injury. Moving machine parts should be lubricated regularly according to manufacturer's instructions.

Stages of Preventive Maintenance for Conveyors.

(i) Inspection.

Belts or rollers are inspected for tensions, wear and tear. Gear box is properly lubricated, various fasteners are tightened and Safety gaards are checked.

(ii) Repair

Rollers and belts are checked, adjusted or repaired. Couplings, packing, Safety gaards, gear transmission, bearings are adjusted as per their Conditions and requirements.

iii Overhaul

The Conveyor system is Completely dismantled Components, worn out and beyond repair item like belts, bearings, Packing, oil Sealers are replace. Structures and Safety gaurds may be repaired as per their Conditions.

Equipment Records.

Equipment records are information Containing the details of installation, Service, repair, maintenance activities, Conditions, defects, schedules and plans for future implementation.

Equipment records are to be cured to maintain Control on maintenance cost, reliability and availability.

Types of equipment records.

i) planned work and percentage of planned work achieved

ii) Ratio of planned to planned work.

iii) Production delays & Downtime.

iv) Future patterns.

(v) Ratio of Preventive work to Corrective work

(vi) Repetitive breakdown.

(vii) Manuals including operating manual, Maintenance manual and drawings.

(viii) History Cards and records.

(ix) Spare Cards.

(x) Maintenance requirement records.

(xi) Performance details

(xii) Cost reports

(xiii) Condition monitoring reports.

Advantages of Equipment Records.

(i) Clear picture about the details of maintenance programmes is obtained.

(ii) Information about Completed, Pending and regular jobs carried out to the equipment are available.

(iii) Helps in standardization of Procedures.

(iv) Evaluation of Performance of maintenance tasks.

(v) Provide details of frequency of Maintenance requirements for each equipement.

vii) Comparision of time taken for completing the maintenance job with the past records.

Maintenance work Execution, monitoring and Control.

1. Monitoring

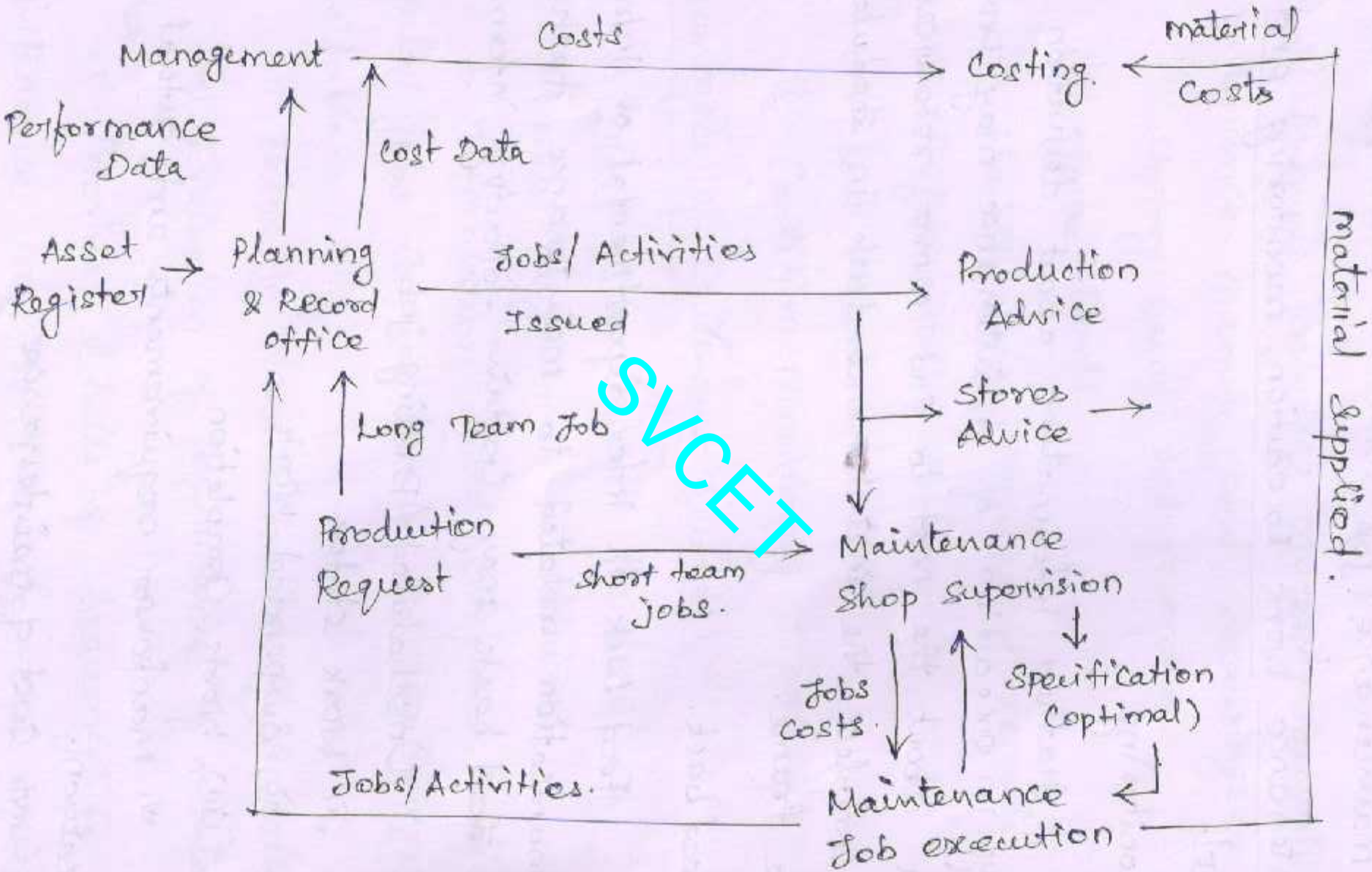
Grather information about deviation and delay in execution of maintenance may provide idea about the need to add more resources to complete the maintenance task in sheduled time frame.

2. Feed back.

Feed back is inter departmental or intra Communication related to maintenance tasks. the feed back may contain following information.

i) Unschaduled / Pending job
ii) Work status.
iii) Suspended work.
iv) Work Completion
v) Manpower requirements and actual Utilization.
vi) Cost of maintenance
vii) Technical Difficulties.

3. Control system.



5. Control

The following are the three important role of Control of maintenance activities.

i) Continuous or periodical monitoring

ii) Inspection of status

iii) Comparison of status with the predetermined standard and initiating Corrective measures.

Job Cards and Job Card Procedures.

Job Cards Contain necessary details for Performing individual job in maintenance. Job Card may be in the form of a Card, Sheet or Printout.

Job Card Contains the following information.

i) Equipment Code and Shop Code

ii) Job Code

iii) Nature of job & Job details.

iv) Initiation time

v) Job start and completion time

vi) Man hours spent

vii) Constrains / deviations.

Benfits of Job Card Systems.

The following are the benefits and advantages of job Card System.

i) Information about maintenance history.

ii) Knowledge of frequency of maintenance for equipments.

iii) Details of equipments which require maximum resources.

iv) Helps in Job auditing.

v) Evaluation of Cost of maintenance

vi) Information about equipment downtime.

vii) Estimation of loss of Production.

viii) Idea about man power utilization.

Computerized maintenance management System.

* Computer is an efficient and reliable tool for maintenance personal to plan and implement their programmes.

* The Succes of CMMS depends on the quality of integration of Computer System in maintenance management.

* Computerized maintenance management system is used to track all maintenance costs and equipment repairs. This tracking is accomplished by the monitoring of work orders.

* By monitoring work order and utilizing Proper Scheduling of the work orders, the repair Costs Can be monitored.

* Effective cost Control through CMMS is also achieved by the monitoring of purchase and inventory costs. This will track spare part costs and aims to avoid excessive inventories.

* This module also helps in vendor Selection and monitor the shipping time. The predominant function in CMMS is the Scheduling of the Preventive maintenance faction.

* Proper Scheduling Can reduce 'over maintenance' and increase uptime and extend the life of the facilities and equipment.

A Computerized maintenance management System includes the following aspects.

i) Development of a database
ii) Analysis of available past records.
iii) Development of maintenance schedules.
iv) Availability of maintenance materials
v) Feed back Control system
vi) Project management.

Computerization of maintenance system.

Objectives:-

i) Maintenance of existing equipment
ii) Inspection and service of the equipment
iii) Installation or revamping of the equipment
iv) Maintenance Store keeping.
v) Craft administration.

These objectives incorporate the following subtasks

i) Reduction of downtime Costs
ii) Maximizing the operating life of equipment
iii) Execution of Preventive maintenance work.
iv) Minimizing the spare parts inventory.
v) Maximizing the productivity of the workforce.

Advantages of CMMS.

i) Improve maintenance efficiency.

ii) Reduce maintenance costs

iii) Reduce the equipment downtime by proper scheduling

iv) Reduce the overtime and ensures optimal utilization of manpower

v) Increase the life of equipment.

vi) Provide historical database to assist in maintenance planning and budgeting.

vii) Provide maintenance reports in specific formats depending on the requirements.

viii) Quicker acess to plant maintenance statistics

ix) Conformity with health and safety standards.

x) Compliance with industry and statutory regulatory standards.