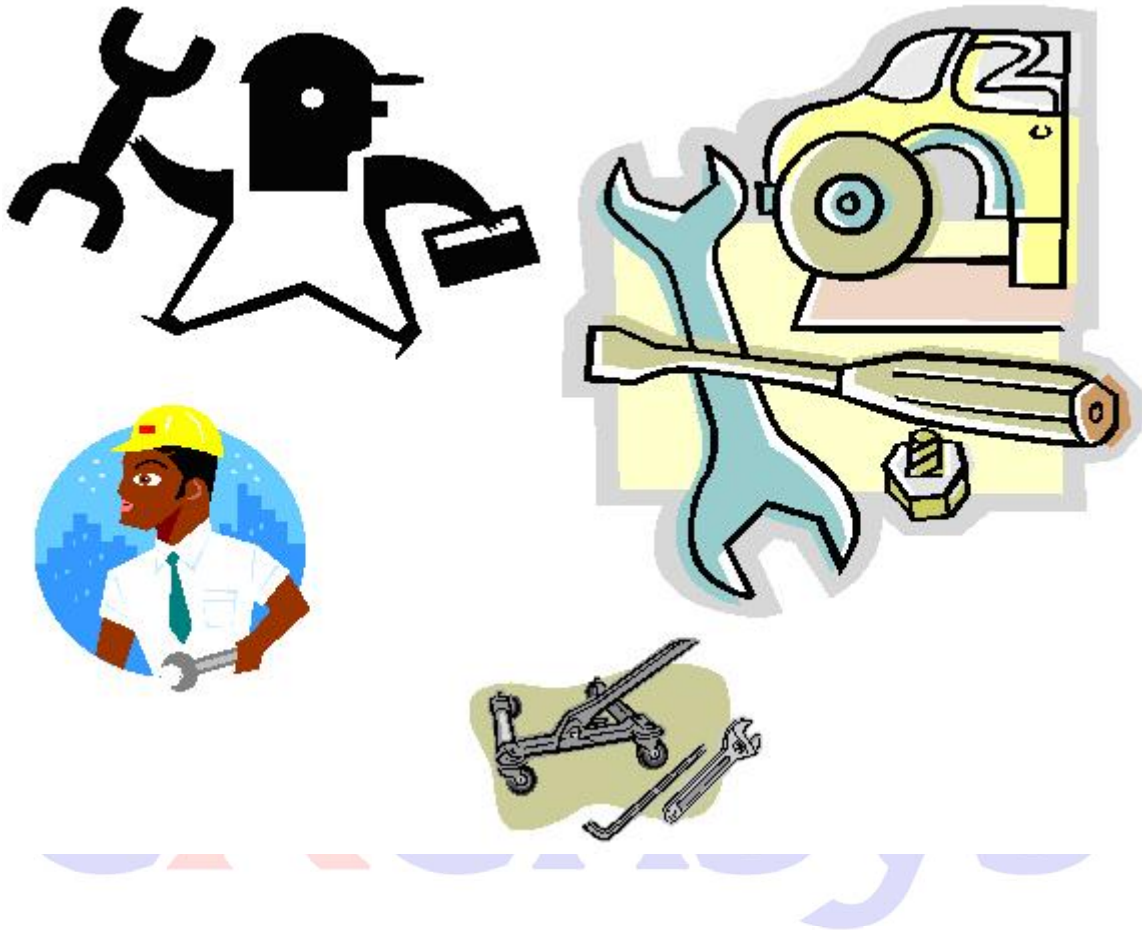


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Business Performance Sustained

Best Practice eXensys –Maintenance Order Cycle

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Table of Contents

Introduction: 3

Overview:..... 4

Benefits:..... 6

Conclusion: 6



| | | |
|---------------------------------|---|-------------------|
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| White Paper | | W. E. F. dd/mm/yy |

Introduction:

Maintenance activities are carried out through Maintenance Orders (MO). Maintenance Order is a document that contains the list of tasks to be performed on the machine along with the resource requirement for each task. It also gives the information regarding the items required and to raise purchase requisition if materials are not available in the inventory. The maintenance order cycle covers all major processes supported by eXensys 4.1 to support day to day activities carried out by a maintenance department. Once a maintenance order is created, it will go through the execution cycle stage ending with completion of the order and finally settlement. Maintenance order is routed through the maintenance request, which gets approved and later converted to a maintenance order. There is a provision to create following types of maintenance orders in the system:

1. Preventive
2. Corrective
3. Predictive
4. Breakdown
5. Emergency
6. Blanket
7. Refurbishment

While Preventive, Predictive, Breakdown, Corrective and Emergency types of maintenance orders are raised on a machine, Blanket and Refurbishment type maintenance orders are raised on a group of machines in a work center.

Preventive MO as the name indicates, are used to carry out preventive maintenance work on a machine. These MOs are generated automatically based upon the preventive Maintenance Schedules defined. Maintenance Requests gets automatically approved for such types of MO

Corrective MO is typically used for rectifying faults reported through Observation Log Register. These are created automatically based upon the configurator's settings. Maintenance Requests gets automatically approved for such types of MO.

Predictive MO is generated automatically by the system when parameters values of a machine exceed safety limits specified in Predictive Maintenance Schedule. Predictive MOs are generated based upon the machine condition captured as parameter value. Maintenance Requests gets automatically approved for such types of MO.

Breakdown MO is used for restoring back the equipment in breakdown condition to normal working condition. Here all the tasks that are performed are in "shut down" conditions. Maintenance request is generated manually.

Emergency MO is used where the breakdown of the machine is very critical. It requires immediate actions to rectify the fault as if delays are there it will incur huge cost to the organization. Here all the tasks that are performed are in "shut down" conditions. Maintenance request is generated manually.

Blanket MO is used to define and execute common work on all the machines belonging to a particular group in a work center. Maintenance request is generated manually.

Refurbishment MO is a special kind of maintenance work like fabrication of new items or recondition of existing items. These are raised on a machine group.

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Maintenance request is generated manually. After approval of request MOs are generated automatically.

Overview:

We will see one cycle of Preventive Maintenance Order type

Machine

| Machine Code | Origin | Standard Procedure | Work Group | Spare BOM | Life Parameter Code | UOM | Starting Value |
|--------------|------------|--------------------|------------|-----------|---------------------|-------|----------------|
| M1 | Production | SP1 | WG1 | bom_1 | Runing Hours | Hours | 50 |

Machine Maintenance Details

Machine Code: M1

| Type | Parameter Code | UOM | Value | From | To | Attribue Value | Starting Value |
|-----------|----------------|-------|-------|------|-----|----------------|----------------|
| Technical | Power | Watts | 10 | NA | NA | NA | NA |
| Attribute | Lube Color | NA | NA | NA | NA | Clear | NA |
| Range | Temperature | Deg C | NA | 150 | 200 | NA | NA |
| Consumpti | Runing Hours | Hours | NA | NA | NA | NA | 50 |

Standard Procedure Code: SP1

| Priroity Sequence | Task Code | Resource Type | Resource Code |
|-------------------|-------------|---------------|---------------|
| 1 | Isolation | Employee | Electrician |
| 2 | Lubrication | Employee | Skill_Helper |

Resource Code: Electrician

Resource Type: Employee

Employee Code: Emp_001

Preventive Maintenance Schedule: PMS_01 for Machine Code: M1

From Date 01.09.08
To Date 30.09.08

| Schedule Type | Period Type | Bucket Interval | Interval | Start Date | Parameter Code | UOM | Interval Value | Machine Condition | Estimated duration (hrs.) |
|---------------|----------------|-----------------|----------|------------|----------------|-------|----------------|-------------------|---------------------------|
| Time | Fixed Interval | Weekly | 1 | 01.09.08 | NA | NA | NA | Running | 2 |
| Usage | NA | NA | NA | NA | Runing Hours | Hours | 100 | Shut-Down | 0.1 |

Based upon the time based schedule, Maintenance Orders will generate as follows:

| Maintenance Order | Start Date |
|-------------------|------------|
| MO1 | 01.09.08 |
| MO2 | 08.09.08 |
| MO3 | 15.09.08 |
| MO4 | 22.09.08 |
| MO5 | 29.09.08 |

Maintenance Order Code: MO1 MO Type: Preventive / Reference Code: PMS_01

Maintenance Request Code: MR/0001/0809

Start Date 01.09.08

End Date 01.09.08

Item Required Code: IRC/0001/0809

| Item Code | Item Name | UOM | Requested Quantity | Available Quantity in Inventory | Purchase Quantity |
|-------------|-------------|-----|--------------------|---------------------------------|-------------------|
| Lube_Cas_T3 | Lube_Cas_T3 | Kg | 0.2 | 120 | 0 |

Task Required

| Priority Sequence | Task Code | Task Type | Resource Type | Resource Code | Machine Condition | Est. Duration (Hrs.) |
|-------------------|-------------|-----------|---------------|---------------|-------------------|----------------------|
| 1 | Isolation | Mandatory | Employee | Electrician | Running | 0.1 |
| 2 | Lubrication | Mandatory | Employee | Electrician | Running | 0.2 |

Maintenance Order Reporting: MOR/0001/0809 for MO1

| Priority Sequence | Task Code | Task Type | Est. Duration (Hrs) | Actual Start Date | Actual Start Time | Actual End Date | Actual End Time | Actual Hours | Status |
|-------------------|-------------|-----------|---------------------|-------------------|-------------------|-----------------|-----------------|--------------|-----------|
| 1 | Isolation | Mandatory | 0.1 | 0.09.08 | 11:15 | 01.09.08 | 11:21 | 0.1 | Completed |
| 2 | Lubrication | Mandatory | 0.2 | 0.09.08 | 11:21 | 0.09.08 | 11:33 | 0.2 | Completed |

All the prices are in INR

Item Consumption against MO1

| Item Code | Item Name | UOM | Required Qty | Received Quantity | Consumed Qty | Return Qty | Issue Price |
|-------------|-------------|-----|--------------|-------------------|--------------|------------|-------------|
| Lube_Cas_T3 | Lube_Cas_T3 | Kg | 0.2 | 0.2 | 0.2 | 0 | 80 |

Maintenance Order Settlement: MOS/0001/0809 against MO1 and MOR/0001/0809

Labor Reporting

| Code | Name | Time (Hrs) | Rate/Hr | Labor Cost |
|---------|---------|------------|---------|------------|
| Emp_001 | Emp_001 | 0.3 | 200 | 60 |

Overhead Reporting

| Activity Element Code | Activity Element Name | Rate Type | Rate/Hr | Time (Hrs) | Activity Element Cost |
|-----------------------|-----------------------|-----------|---------|------------|-----------------------|
| L-CL-OH-11 | Carrying Cost | Std Rate | 1 | 0.15 | 0.15 |

Total Cost

Item cost = 16

Labor Cost = 60

Overhead Cost = 0.15

Total Maintenance Cost for MO1 = 16+60+0.15 = 76.15

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Benefits:

1. Better work planning for optimal utilization of resources and timely availability of spares.
2. Maximum machine availability through machine reliability management.
3. Seamless integration with other modules like Inventory, Purchase, Manufacturing, Finance, Human Capital Management

Conclusion:

eXensys Plant Maintenance module helps in capturing information regarding the machine master and related data as well for analyzing/reviewing of maintenance history. Plant Maintenance module addresses the maintenance needs of a manufacturing organization. It can effectively meet the requirement of organizations in diverse industries like Utilities (Power), Cements, Paper and Pulp, Mining, Automobiles etc.

It provides complete life cycle management of a machine installed. It supports Breakdown, Preventive and Predictive maintenance along with resource and spare parts planning. It supports TPM concepts.

