Plant Maintenance in SAP
A functional perspective

By – Gopinath
Overview: R/3 Overview and Integration
Plant Maintenance - Overview

What Is Integration?

- Common organizational structures throughout the system
- Seamless processing of common data between applications
- Comprehensive support and reference tools
- Common reporting features and functionality
- Object and application linking and overall system communication
Plant Maintenance - Overview

Organization of Plant Maintenance: Business Scenario

- Plant Maintenance is an integral part of the company and has numerous links to other enterprise areas.
- Depending on the company structure, maintenance planning is either plant-based (decentralized) or cross-plant (centralized).
# Plant Maintenance - Overview

## Structure of Plant Maintenance

<table>
<thead>
<tr>
<th>EQM</th>
<th>Technical Data</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Functional locations</td>
</tr>
<tr>
<td></td>
<td>Equipment</td>
</tr>
<tr>
<td></td>
<td>Assemblies</td>
</tr>
<tr>
<td></td>
<td>Bills of material</td>
</tr>
<tr>
<td></td>
<td>Networks of technical objects</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PRM</th>
<th>Preventive Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Task lists</td>
</tr>
<tr>
<td></td>
<td>Maintenance plans</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WOC</th>
<th>Maintenance Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maintenance notifications</td>
</tr>
<tr>
<td></td>
<td>Maintenance orders</td>
</tr>
</tbody>
</table>

| PMIS | Plant Maintenance Information System |

<table>
<thead>
<tr>
<th>CRP</th>
<th>Work Centers and Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maintenance work centers</td>
</tr>
</tbody>
</table>
Plant Maintenance - Overview

Concept of Plant Maintenance

Master data
- Characteristics
  - Classes
- Equipment / functional locations

Cost records
- Cost center
- Maintenance work centers

Bills of material
- Task lists
- Maintenance strategies

Planning
- Maintenance notification
- Maintenance plans

Order processing
- Material reservation
- Material issues
- Maintenance order
  - Capacity load
  - Time confirmation
- Purchase requisition
  - Purchase orders / release order
  - Goods receipt / invoice receipt

Purchase requisition
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Organizational Structures in Plant Maintenance

General Organizational Units in Logistics
- Client
- Company code
- Plant

Location-Based Organizational Units
- Maintenance plant
- Location
- Plant section
- For example, site, building, coordinate
- For example, production area, plant engineer

Planning-Based Organizational Units
- Maintenance planning plant
- Maintenance planner groups
- Maintenance work centers
- For example, foreman, work scheduling
- For example, mechanics
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Cross-Plant Maintenance

- Maintenance requirement
- Planning of maintenance requirements
- Maintenance requirement
- Workshops
- Warehouse
- Material

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Maintenance Work Centers

For example:
- Welding
- Metalworking
- Mechanics
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Work Center: Contents

- Basic data
  - General data

- Capacity data
  - Capacity categories
  - Scheduling

- Capacity / pool capacity
  - Available capacity profile

Links

- Activity types
- Cost center
- Work center
- Person
- Qualification
- Staffing assignment

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Work Center: Main Functions

<table>
<thead>
<tr>
<th>Work Center</th>
<th>Task list / order</th>
<th>Costing</th>
<th>Lead time scheduling/Capacity planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default values for task lists and orders</td>
<td>Costing data</td>
<td>Scheduling data and available capacity</td>
<td></td>
</tr>
</tbody>
</table>

- Lead time scheduling:
- Capacity planning:

| | Task list / order | Costing | Lead time scheduling/Capacity planning |
| | | | |
| | | 2,724.00 | |
| | | 1,200.00 | |
| | | 124.00 | |
| | | 4,048.00 | |
Functional Location

Functional location = multi-level, hierarchical structure, organized according to ...
# Plant Maintenance - Overview

## Criteria for Functional Locations

<table>
<thead>
<tr>
<th>When is a functional location created?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Execution of maintenance tasks</td>
</tr>
<tr>
<td>Recording of maintenance tasks</td>
</tr>
<tr>
<td>Data collection over long periods of time</td>
</tr>
<tr>
<td>Cost monitoring by area</td>
</tr>
<tr>
<td>What effect do the usage conditions have on the likelihood of damage to the installed aggregates?</td>
</tr>
</tbody>
</table>

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Automatic Assignment Upon Creation

Existing functional locations

C1-M Mechanical cleaning
- C1-M01 Sand trap
- C1-M02 Oil/fat trap

C1 Clarification plant

C1-B Biological cleaning
- C1-B01 Pump plant
- C1-B02 Filtering station

New functional locations

C1-M01-2 Ventilator
C1-M02-2 Ventilator
C1-B01-1 Pump 1
C1-B02-2 Filter cell

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Example of Functional Location Structure

C1 Clarification plant

C1-M Mechanical cleaning

C1-M01 Sand trap
C1-M02 Oil/fat trap

C1-M01-1 Reservoir
C1-M01-2 Ventilator
C1-M01-3 Sand dredger

C1-M02-1 Reservoir
C1-M02-2 Ventilator
C1-M02-3 Fat dredger

C1-B Biological cleaning

C1-B01 Pump plant
C1-B02 Filtering station

C1-B01-1 Pump 1
C1-B01-2 Pump 2

C1-B02-1 Ventilator
C1-B02-2 Filter cell

C1-B02-1A/1 Valve 1
C1-B02-1A/2 Valve 2
C1-B02-2A/1 Valve 1
C1-B02-2A/2 Valve 2
C1-B02-2B/1 Inlet
C1-B02-2B/2 Filtrate level
C1-B02-2C/1 Outlet
C1-B02-2C/2 Outlet

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Criteria for Equipment Master Record

When is a piece of equipment created?

- Management of individual data
- Recording of maintenance tasks
- Object-based recording of costs
- Evaluation of technical data
- Recording of usage times

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Bills of Material in Company

- Production bill of material
- Engineering/design bill of material
- Maintenance bill of material
- Costing bill of material

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Breakdown Maintenance: Business Scenario

- For breakdown maintenance, the data required for the other business processes needs to be entered quickly and easily so that the subsequent steps can be executed.
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Maintenance Order: Putting in Process

- Status: 'RELEASED'
- Order papers
- Put in process

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# Plant Maintenance - Overview

<table>
<thead>
<tr>
<th>Time Confirmations</th>
<th>SAP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial screen</strong></td>
<td>Individual entry&lt;br&gt;Collective entry&lt;br&gt;Collective entry using operation list&lt;br&gt;Overall completion confirmation</td>
</tr>
<tr>
<td><strong>Scope</strong></td>
<td>Partial confirmation&lt;br&gt;Final confirmation</td>
</tr>
<tr>
<td><strong>Reversal option</strong></td>
<td></td>
</tr>
</tbody>
</table>
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Maintenance Order: Technical Completion

Order 901760

- Limited ability to change order
- Status 'Technically completed'
- Define location and account assignment data
- Create settlement rule
  - Set deletion flag for purchase requisitions
  - Close open reservations
  - Close open capacities

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Cycle for Corrective Maintenance

1. Notification
   - Technical object
   - Description
   - Date
   - Malfunction

2. Planning
   - Work to be performed
   - Internal/external resources
   - Material
   - Tools

3. Scheduling
   - Order release
   - Printout
   - Capacity leveling
   - Availability check

4. Execution
   - Planned/unplanned material withdrawal
   - External procurement

5. Completion
   - Time confirmation
   - Order settlement
   - Technical completion
   - Technical confirmation

History
Material usage, orders, notifications, PMIS, usage list

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Definition of Maintenance Notification

- **Malfunction report**: Describes the condition of a maintenance object, particularly a malfunction
- **Activity report**: Describes a maintenance activity already performed (purely technical documentation)
- **Maintenance request**: Requests a maintenance service/task
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Maintenance Notification: Structure

- Notification
  - Date / time / reported by
  - Description
  - Object:
    - Functional location
    - Equipment
    - Assembly
    - Material serial number
  - Location data
  - Breakdown / availability

- Notification items
  - Damage location
  - Damage
  - Cause of damage

- Activities
  - Activity
  - Execution factors

- Tasks
  - Dates
  - Task description
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Maintenance Notification: Object Information

- Orders
- Notifications
- Maintenance dates
- Processing days
- Documents
- Object information
- Links
- Structure list
- Breakdowns
Select Maintenance Notifications

Why?
- Find particular maintenance notification
- Process several maintenance notifications simultaneously
- Restrict planning worklist

Scope
- Notification
- Notification items
- Tasks

Customizing
- Selection conditions
- Field selection

Functions
- Different sorting
- Select / delete complete list
- Different list fields, internal display variant
- Display breakdowns graphically
- Excel processing
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Print Maintenance Notifications

Maintenance notification

Fax transfer

Notification overview
Breakdown report
Activity report

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   - Technical completion
   - Technical confirmation
   - Order settlement

**History**
Material usage, orders, notifications, PMIS, usage list

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## Plant Maintenance - Overview

### Creation of Maintenance Orders

<table>
<thead>
<tr>
<th>Maintenance order / notification</th>
<th>Maintenance notification</th>
<th>Maintenance order</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct creation of order</td>
<td></td>
<td></td>
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</tbody>
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<table>
<thead>
<tr>
<th>Maintenance notification</th>
<th>Maintenance notification</th>
<th>Maintenance order</th>
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<tbody>
<tr>
<td>Creation of order based on notification</td>
<td>Maintenance notification</td>
<td></td>
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</tbody>
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<tr>
<th>Maintenance notification</th>
<th>Maintenance notification</th>
<th>Maintenance order</th>
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</thead>
<tbody>
<tr>
<td>Combination of maintenance notifications for maintenance order</td>
<td>Maintenance notification</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Maintenance order</th>
<th>Maintenance notification</th>
</tr>
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<tbody>
<tr>
<td>Entry of order with subsequent activity report</td>
<td>Maintenance order</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Maintenance item</th>
<th>Maintenance order</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic generation of maintenance order from maintenance item</td>
<td>Maintenance order</td>
</tr>
</tbody>
</table>
## Characteristics of Maintenance Orders

<table>
<thead>
<tr>
<th>Flexibility of order processing</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Object reference</strong></td>
<td></td>
</tr>
<tr>
<td>- Single object</td>
<td></td>
</tr>
<tr>
<td>- Object list</td>
<td></td>
</tr>
<tr>
<td><strong>Period of validity</strong></td>
<td></td>
</tr>
<tr>
<td>- Single order</td>
<td></td>
</tr>
<tr>
<td>- Standing order</td>
<td></td>
</tr>
<tr>
<td><strong>Execution</strong></td>
<td></td>
</tr>
<tr>
<td>- Internal processing</td>
<td></td>
</tr>
<tr>
<td>- External processing</td>
<td></td>
</tr>
</tbody>
</table>
Plant Maintenance - Overview

Stock Material - Process Flow

Component assignment

Material reservation

Availability check

Order release

Automatic availability check

Printing

Goods issue

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Cycle for Corrective Maintenance

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History
Material usage, orders, notifications, PMIS, usage list

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Resource Planning: Availability Check

- Plant stock
- Inward stock movement from purchase order
- Material withdrawal for cost center
- Stock transfer to other plant
- Inward stock movement from internal production
- Stock profile
- Safety stock
- Today
- Requirement date
- Maximum ATP quantity

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Maintenance Order: Printing

- Job ticket
- Operation control ticket
- Pick list
- Object list
- Material withdrawal slip
- Confirmation slip
- Time ticket

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Order Completion Confirmation: Times / Activities

- **Times**
  - Individual entry
  - Collective entry
  - Overall completion confirmation
  - Time sheet (CATS)

- **Activities**
  - Activity reports
  - Overall completion confirmation
  - Confirmation texts

- **Object changes**

- **Measurement readings**

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• Questions ??

• Contact Details:
  mail id: gthangavelu@darylflood.com
  Cell: 469-879-4674
  Residence: 972-444-8510