

281 Pages

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mySAP PLM

PLM305 : Structuring and Managing Technical Objects

SAP PLM : ALM - Plant Maintenance Certification

PLM305: Structuring and Managing Technical Objects

Part I of I

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**SAP PLM: ALM Plant
Maintenance
Certification Curriculum**

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Icons in Body Text

The following icons are used in this handbook.

| Icon | Meaning |
|---|--|
|  | For more information, tips, or background |
|  | Note or further explanation of previous point |
|  | Exception or caution |
|  | Procedures |
|  | Indicates that the item is displayed in the instructor's presentation. |

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Course Overview

The intensive training course PLM305 *Structuring and Managing Technical Objects* expands on the object and technical system structuring topics introduced in PLM300 *Plant Maintenance* from the point of view of both maintenance and customer service. On the one hand, we also look at more advanced functions relating to functional locations, equipment and bills of material. On the other, we also deal with serial numbers, measuring points and counters, classification and configuration, and a whole range of additional functions.

The training is rounded off by a chapter dealing specifically with practical examples from customer projects, and by the required settings in Customizing.

Target Audience

This course is intended for the following audiences:

- Project Manager
- Project Team

Course Prerequisites

Required Knowledge

- PLM300 Plant Maintenance

Recommended Knowledge

- SAP01
- SAPPLM



Course Goals

This course will prepare you to:

- The training course PLM305 *Structuring and Managing Technical Objects* deals in detail with object and technical system structuring, which forms the backbone of the development of maintenance and service measures in the Enterprise Asset Management and Customer Service areas.
- Here we show all the necessary settings in Customizing.



Course Objectives

After completing this course, you will be able to:

- Create and structure functional locations
- Apply equipment
- Apply bills of material and assemblies
- Apply serial numbers
- Apply structuring examples from customer projects
- Apply classification and configuration
- Apply measuring points and counters
- Apply additional functions (such as partner, user status, guarantees)

SAP Software Component Information

The information in this course pertains to the following SAP Software Components and releases:

Unit 1

Functional Locations

Unit Overview

This chapter follows on from the chapter *Technical Objects* in the course PLM300, recapitulates the term and concept of the functional location and then expands on the application of functional locations with a whole range of detailed functions and their related Customizing settings.



Unit Objectives

After completing this unit, you will be able to:

- Enter complete location structures quickly
- Use data transfer
- Use reference locations
- Create alternative labels
- Work with alternative labeling systems
- Make all the necessary Customizing settings
- List the options for customer enhancements

Unit Contents

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Lesson: Structuring of Functional Locations

Lesson Overview

This lesson deals with detailed functions for structuring functional locations



Lesson Objectives

After completing this lesson, you will be able to:

- Enter complete location structures quickly
- Use data transfer
- Use reference locations

Business Example

- In the enterprise, complex system structures are managed from a maintenance perspective.
- These structures are multi-level and organized hierarchically.
- Examples include the connected clarification plant, production lines, offices and buildings, or the internal power station.

Revision

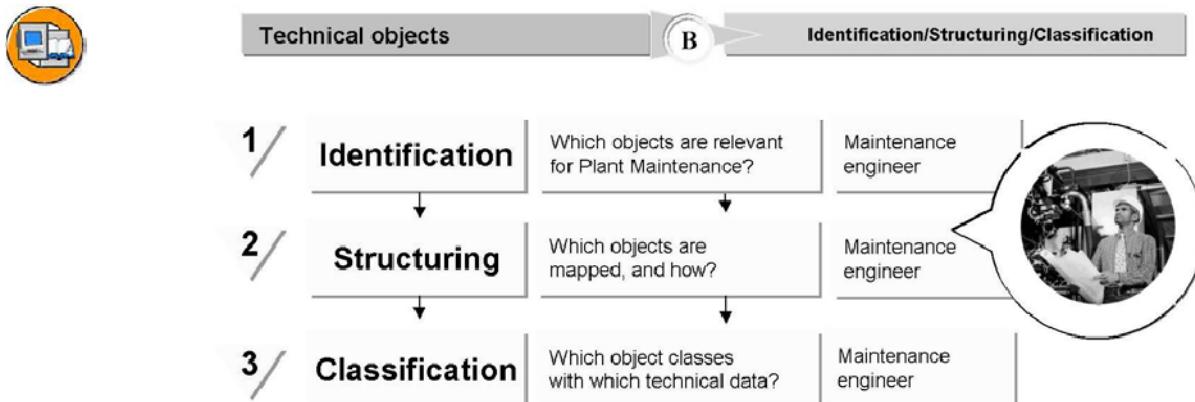


Figure 1: Process for Structuring Technical Objects

Step 1: When starting to map technical objects, you need to decide which objects are relevant for Plant Maintenance – in other words, which objects require maintenance measures and for which objects evaluation is required.

Step 2: In the second step, you choose the structuring instruments for each object (functional location, equipment, assembly, material), and create the structure.

Step 3: In the third step, you create characteristics (= technical characteristics: for example, electrical output) and classes (for example, pump classes). All technical characteristics become available for an object when a technical object (for example, equipment) is assigned to a class.



When do you create a functional location?

| | | |
|--|---|-------------------------------------|
| | <ul style="list-style-type: none">● Execution of maintenance tasks● Documentation of maintenance tasks● Data collection over longer periods of time● Cost monitoring● How do usage conditions influence the likelihood of damage to the installed aggregates? | <input checked="" type="checkbox"/> |
| | | <input checked="" type="checkbox"/> |

Figure 2: Criteria for Functional Locations

You should use functional locations to structure your systems if:

You want to represent the operational structures or technical systems in your company according to functional criteria

Maintenance tasks have to be performed for the individual parts of your technical system and this work must or should be recorded

Technical data for certain parts of your technical system has to be collected and evaluated over a longer period of time

The costs of maintenance tasks have to be monitored for certain parts of your technical system

You want to perform analyses regarding the influence of usage conditions on damage susceptibility for the pieces of equipment installed

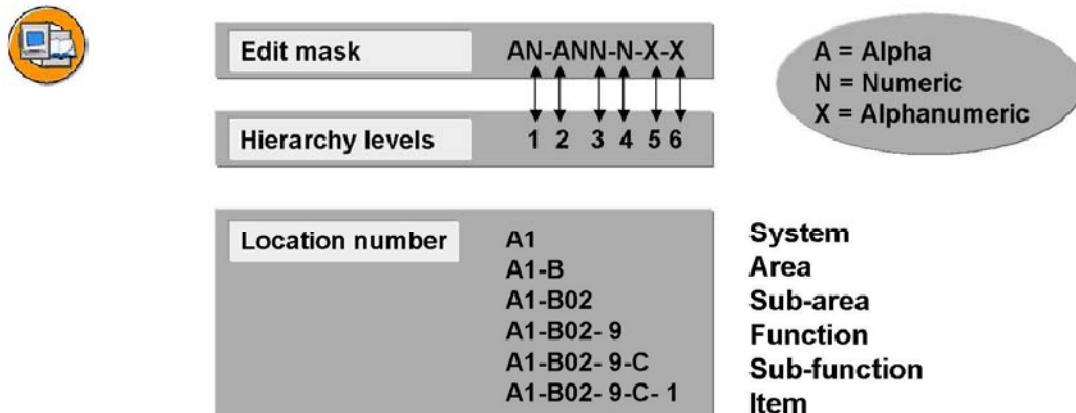


Figure 3: Structure Indicator

The labels (previously: numbers) for functional locations are created using the **structure indicator**. The structure indicator consists of two input fields:

- the **edit screen**
- the **hierarchy levels**

The **edit screen** is used to control which characters may be used when a label is assigned (letters, numbers, or both) and how these characters are grouped together or split. The **hierarchy levels** field is used to define which level ends at which character and how many hierarchy levels the structure may contain.

The label for a functional location can comprise a maximum of 40 characters (= maximum length of the coding template).

Detailed Functions for Functional Locations

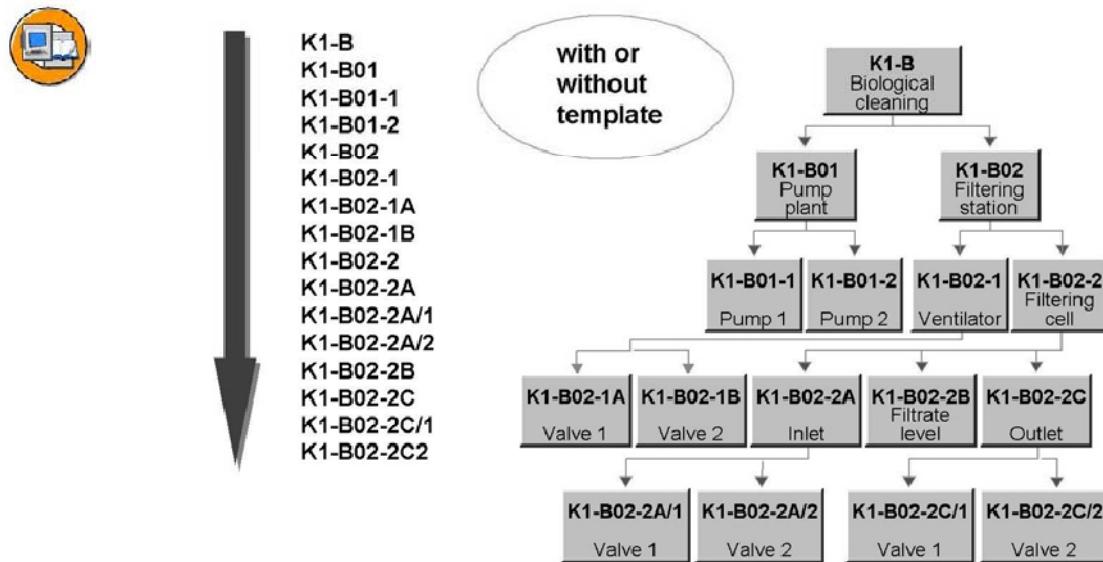


Figure 4: List Entry for Functional Locations

You only enter a master record for a functional location if the following prerequisites have been met:

The structure of the system to be represented in the system has been defined.

The table settings for structuring functional locations have been entered in the system using the Customizing function.

You must know which level of the functional location you wish to create in order to represent its hierarchical structure correctly in the system. The top-down principle applies here: You start with the uppermost level and then enter the respective subordinate levels.

You must know whether the description of the functional location should be entered according to a particular, company-specific system, to simplify search operations.

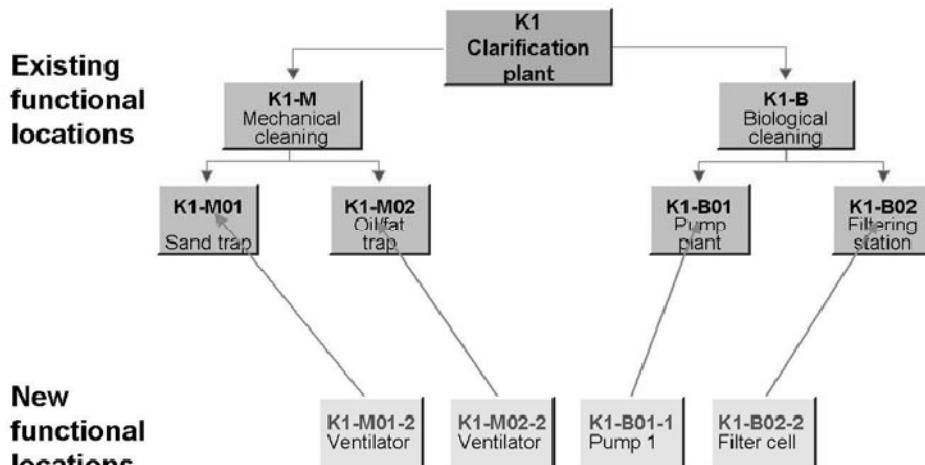


Figure 5: Automatic Assignment Upon Creation

If you create a functional location, the system uses the structure indicator to classify it automatically in the corresponding place in an already existing hierarchy with the same structure indicator.

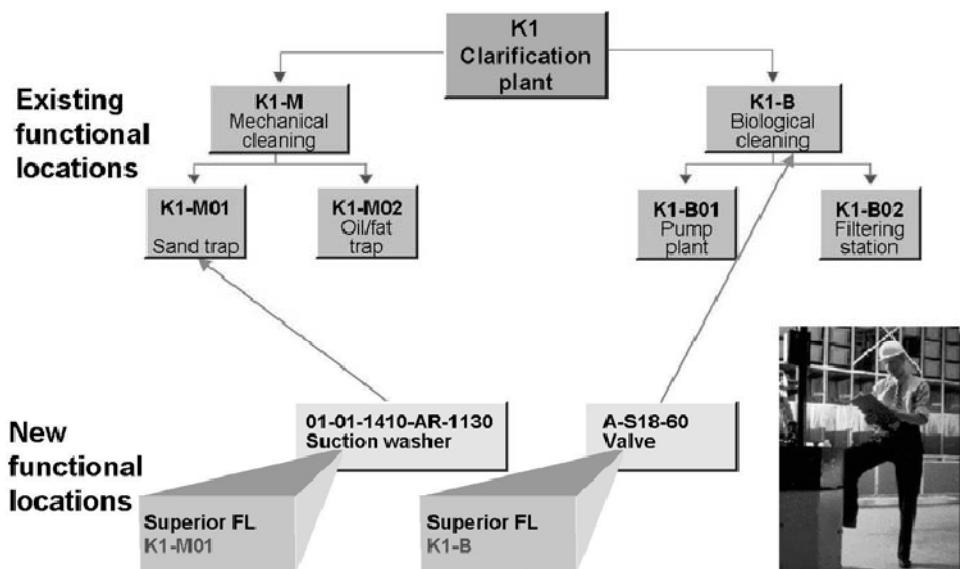


Figure 6: Manual Assignment

It is also possible to support the transfer of data from superior functional locations to subordinate functional locations even if the generic structure of the location numbers has not been used within the location hierarchy. You do this by assigning the directly superior location manually when you create a functional location, thereby overriding automatic determination of the superior location.

This is particularly necessary if individual units of a technical system in your company are identified by a label that describes the position of the unit in the system as a whole. These tag numbers often consist of a letter that stands for the equipment category (for example, M for Motor, or P for Pump) and a sequential number (for example, pump station 0115). This identifier is generally only unique within a plant or a technical system.

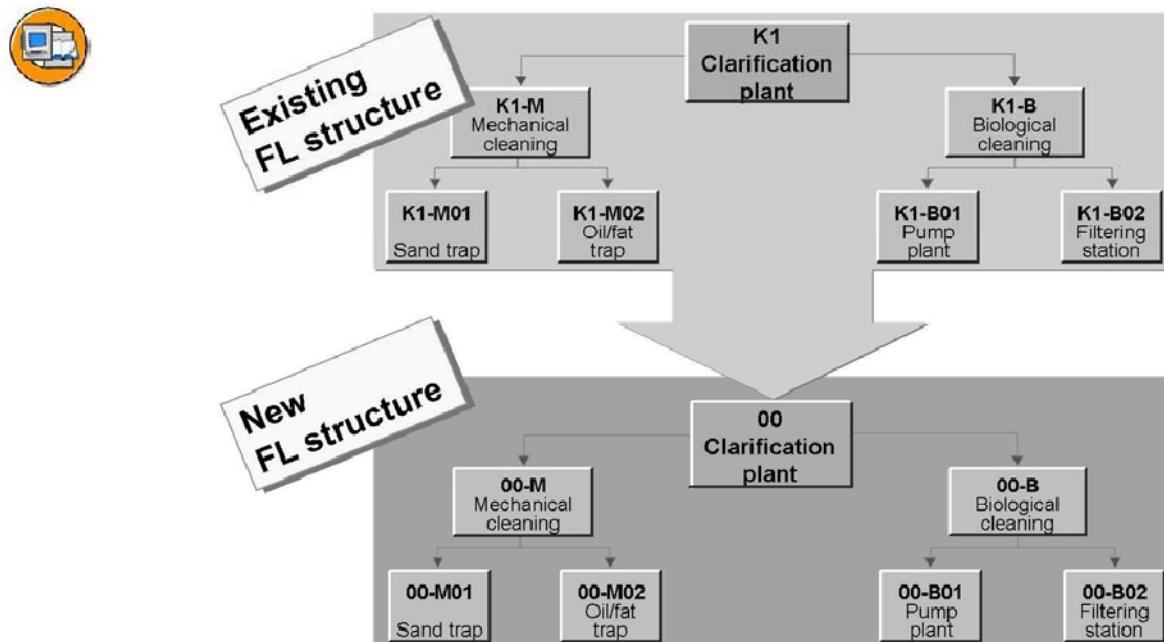


Figure 7: Copying a Complete Functional Location Structure

If you want to represent a location structure that already exists in a similar form in the system, you can use this structure as a template for the new structure. You use this function if the data of the similar structure, to which you refer, has already been saved. You can use this function to access the database and select the objects to be copied.

If the functional location that you are using as a template is based on a reference functional location, this reference is copied at the same time. However, the superior functional location in the location structure is not copied by the system for the new functional location, but searched for again automatically.

If the location used as a template is classified, you can also copy its classification into the new functional location.

If the location used as a template has been assigned measuring points, you can also copy these into the new functional location.

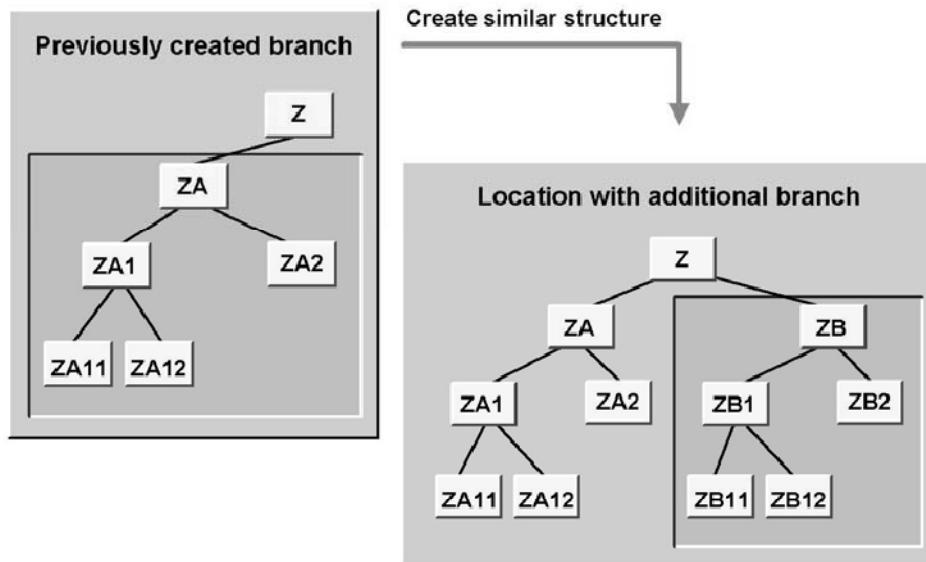


Figure 8: Copying Parts of Structures

The entry of similar structures within a functional location or reference functional location is facilitated by the Change structure function. You can use this function to change and insert a structure branch whose label only deviates at one level from the branch already entered.

You use this function provided that you have not saved the data of the similar structure, to which you are referring. You cannot use this function to access the database.

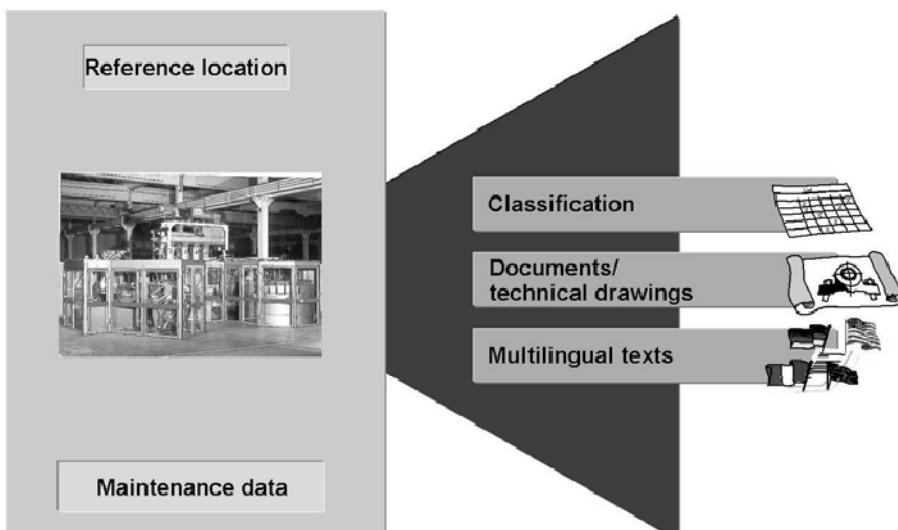


Figure 9: Reference Functional Location

A reference functional location can be used to help create and manage locations. You use it to create and manage several similar functional locations in the system.

You define and manage reference functional locations in individual master records. However, they do not represent actual locations, but are assigned to real functional locations as reference locations.

The master record of a reference functional location contains information that is valid for all functional locations assigned to it. This means that when you create functional locations using reference functional locations, you only need to enter location-specific data.

The system manages the master records for reference functional locations at client level. This means that their labels are unique for an entire corporate group.

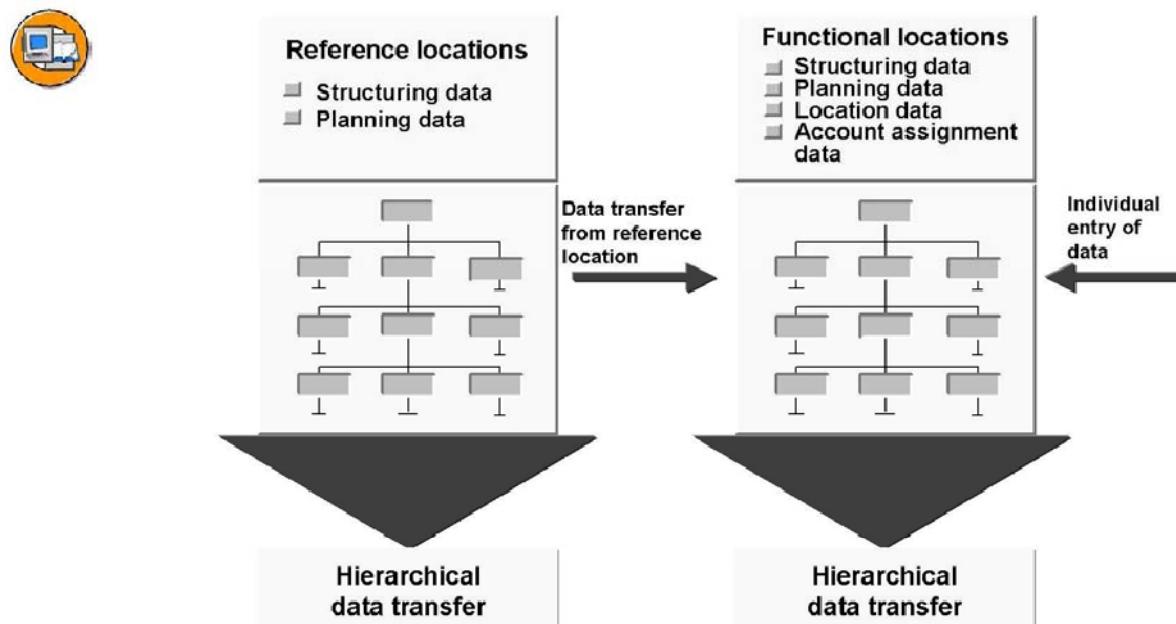


Figure 10: Data Transfer

If a hierarchy is created using functional locations, different options are available for inheriting data at subordinate levels.

The objective is to assign certain central data at the highest level possible, and transfer it automatically to as many objects as possible.

This transfer can be controlled centrally from the uppermost functional location for all fields in the master record. However, the transfer can also be deactivated for a particular level in the hierarchy and a particular field (for example, cost center), which enables each field to be maintained individually.

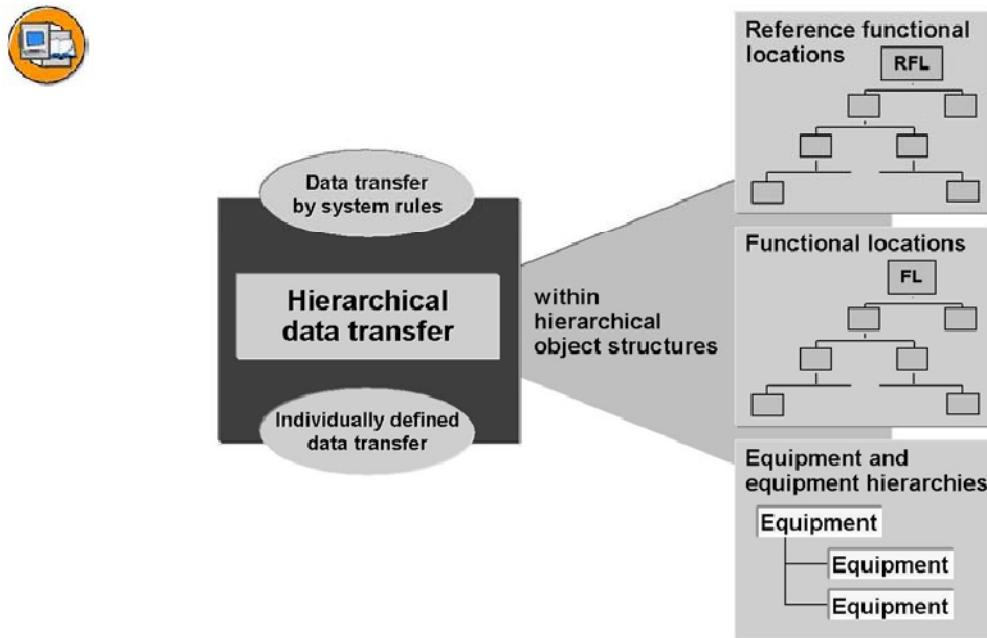


Figure 11: Hierarchical Data Transfer

The following principle applies for data transfer in functional locations and equipment hierarchies:

Starting point: superior object

For example, if a piece of equipment is installed from a functional location, there is no query with regard to data transfer. All fields in the equipment master that contain entries at this point remain unaffected and are identified as **individually maintained** fields. Data from the functional location is automatically copied to any fields that do not contain entries.

Starting point: subordinate object

If the installation is performed from the equipment master record, the data transfer can be influenced using the function *Installation with Data Transfer*. You can then select from a list of fields which field should be maintained individually – in other words, independent of the functional location – and which field should be copied from the functional location.

It is possible to subsequently switch to individual maintenance or copying from the superior object:

- With the functional location, you can use the function *Data Origin* to switch for each field.
- For equipment, the switch is made by dismantling followed by an installation and configuration of fields using the function *Installation with Data Transfer*.

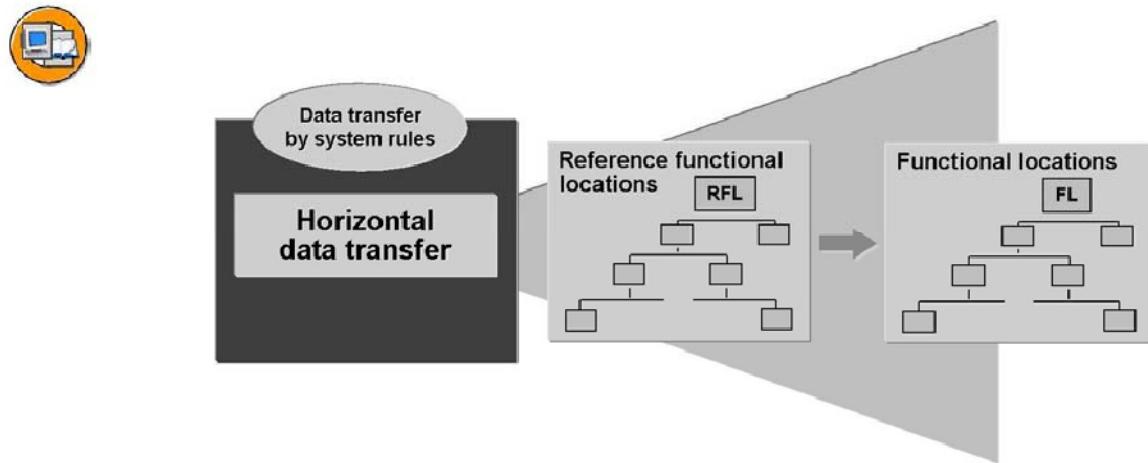


Figure 12: Horizontal Data Transfer

By using reference functional locations, you have the option of specifying category-specific data once for each asset category, then transferring this data to the corresponding functional locations and pieces of equipment and sub-equipment installed at them.

Example: The responsible work center of the functional location *Ventilators* changes for several clarification plants. The employee responsible for maintaining master data makes the change in the master record for the reference functional location *Ventilators* and saves the entry. The system makes the change automatically for all functional locations that have been assigned to this reference location and pieces of equipment that are installed at these locations. It then issues a message informing the employee of the number of functional locations and pieces of equipment to which the data was transferred.

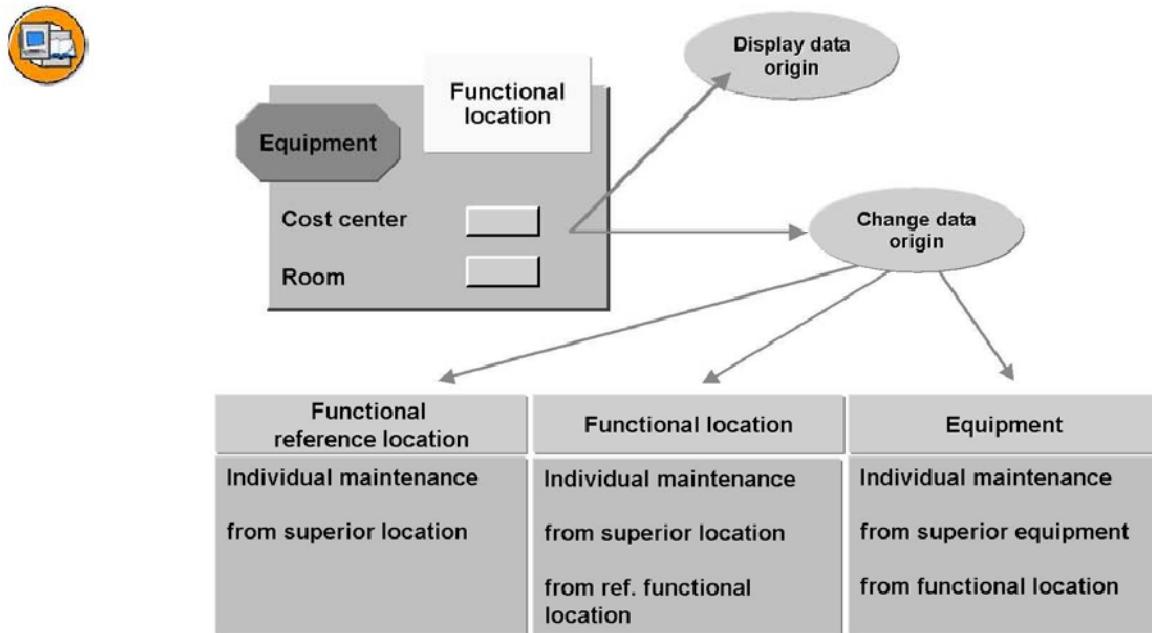


Figure 13: Data Origin

For reference functional locations and functional locations, you can display the origin of the data in the master data fields. There are two different display options available here:

Individual display for an individual field

Overview display

For the individual master data fields for reference functional locations and functional locations, you can determine where the data entered should originate from.

You can specify for reference functional locations whether the data should:

Originate from a superior location in the structure

Be maintained individually for this master record

You can specify for functional locations whether the data should:

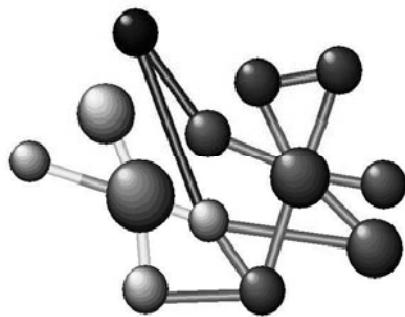
Originate from a superior location in the structure

Originate from a reference functional location

Be maintained individually for this master record

For pieces of equipment, there is an overview display (list of data origin) for each tab page, but no field-based display or change option.

Product Structure Browser



- **Usable for technical objects**
- **With processing functions**
 - Copy part of tree
 - Rename part of tree
 - Relocate part of tree
 - Status operations on parts of tree
 - Change individual objects

Figure 14: Product Structure Browser

The **product structure browser** is part of the Product Data Management (PDM) and is used to display and edit product structures.

Since Release 4.6 it is also possible to display and edit **technical objects** and their structures in the product structure browser. In contrast to traditional structure display in Plant Maintenance, here you can also edit directly in the structure tree (for example, copy parts of structures, add new objects).

You can use a filter to specify which objects are displayed and which are hidden.

The editing is supported by functions such as drag & drop (for example, inserting and removing equipment, moving functional locations).

The transaction code of the product structure browser is **CC04**. In the menu tree, the product structure browser is located in the central functions of the Logistics in the Engineering area.

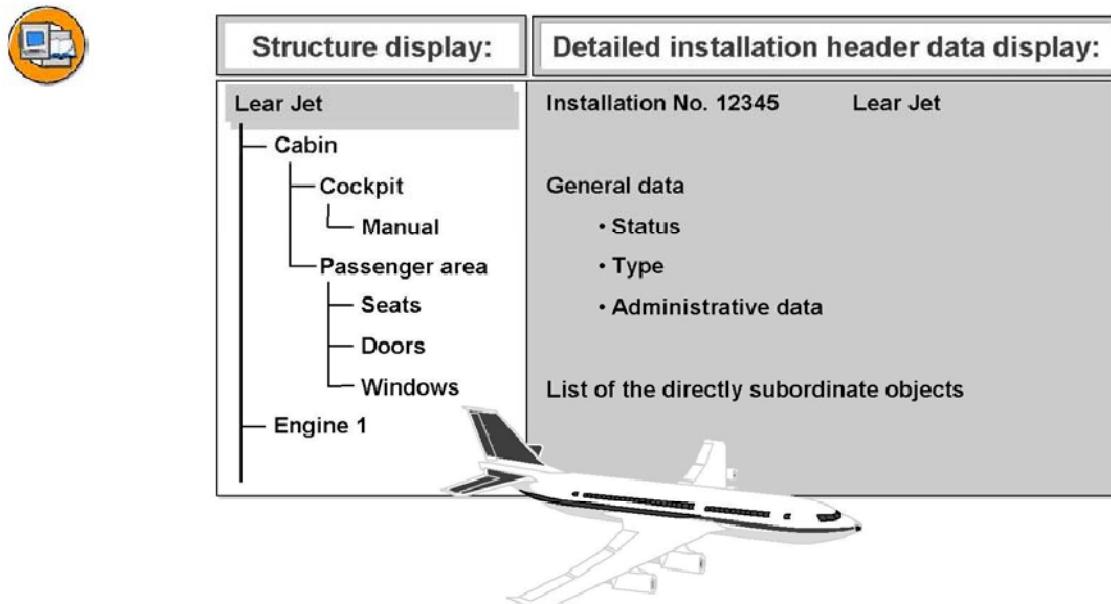


Figure 15: Installation (lbase)

You use the Installation Management to display and manage **products**. You can assign related **equipment**, **materials**, **serial numbers** and **documents** to a shared installation as **components**. The Installation Management can also be used for documentation purposes.

An installation may, for **example**, include an airplane with all service-relevant components. Or it may deal with an unassembled airplane whose components are already managed collectively in the planning and production phase. An installation can also comprise of two wings that will be integrated in the superior installation "Airplane" when production is complete.

Advantages of an Installation:

- Multilevel representation of components
- Time-based delimitation possible (insertion/removal time of a component)
- Components do not have to be represented as equipment master records
- Additional data entry for components

The **aim of the installation** is in particular to generate a structure from a production or sales order.

At the present time, installation is not being considered as an alternative to existing object structuring methods in Plant Maintenance. This is because functional locations have not been supported, and the link to maintenance processing (notification/order) has not been realized.

Exercise 1: Functional Locations

Exercise Objectives

After completing this exercise, you will be able to:

- Enter and copy location structures
- Use data transfer
- Use reference locations
- Use alternative labels

Business Example

All the locations in the enterprise should be represented in the SAP system. This includes the creation of a number of functional locations, such as workshops, production lines, green areas, car parks and so on, with slightly different structural specifications, but often the same organizational assignment.

Task 1:

General Questions About Functional Locations:

1. Is the structure indicator unique across the system?

2. How do you proceed if you have assets (functional locations) with the same ID (= number) in several plants?

3. Which functions can be executed with functional locations and reference locations?

Continued on next page

| Function | Functional Location | Reference Location |
|--------------------------|---------------------|--------------------|
| Install equipment | | |
| Create order | | |
| Assign measuring point | | |
| Classification | | |
| Assign documents | | |
| Enter multilingual texts | | |

Task 2:

Entering Reference Locations

The reference location structure displayed in the following table should be represented in the system.

For this, you first have to define a suitable structure indicator in Customizing.

Then you enter the reference locations in the specified sequence while observing the respective hierarchy level.

| Reference Location | Description | Level | Superior reference location |
|--------------------|---------------|----------|-----------------------------|
| R## | System ## | 1. Level | ? |
| R##-A | Area A | 2. Level | ? |
| R##-B | Area B | 2. Level | ? |
| R##-1 | Area 1 | 2. Level | ? |
| R##-12 | Sub-area 2 | 3. Level | ? |
| R##-123-A | Subfunction A | 5. Level | ? |
| R##-123 | Function 3 | 4. Level | ? |
| R##-123-B | Subfunction B | 5. Level | ? |
| R##-123-AA | Item A | 6. Level | ? |

1. Create a suitable structure indicator Gr## while observing the following requirements.

Continued on next page

The system always has three characters and is represented alphanumerically (1st level).

The areas of the system are represented alphanumerically (2nd level).

The sub-areas are represented numerically (3rd level).

The functions are represented numerically (4th level).

The subfunctions and items are represented alphabetically (5th/6th level).

How do you proceed?

2. Create the reference location hierarchy specified above using your structure indicator Gr##.

How do you proceed?

Use the following data:

| Description | System ## |
|--------------------------------------|-----------|
| Planning plant | 1000 |
| Planner group | I## |
| Responsible work center | T-ME## |
| Plant of the responsible work center | 1000 |

3. Which reference location has an “incorrect” superior reference location?
4. How can you correct this?

Task 3:

Copying Parts of Structures

1. In the structure of functional location ##, part of the structure is for sludge processing.
Which functional locations belong to this part?
2. Which structure indicator does the system ## use?
3. In the clarification plant there is another part for sludge processing with the number ##-SLC, which you want to look exactly the same in the structure as the sludge processing mentioned above.

Continued on next page

How do you proceed in order to insert this part of the structure as easily as possible?



Hint: Make sure you use the correct structure indicator!

4. Structural Display

Display the structure of functional location ## in list form and as a graphic. Which menu path do you choose?

Task 4:

Hierarchical Data Transfer Across the Complete Structure

1. To which main work center and maintenance planner group is functional location ## assigned?
2. Enter your work center T-ME## and your maintenance planner group I##. What system message is issued when you save?
3. Check whether the information has been transferred to all the subordinate functional locations.

What is the easiest way of doing this?

Task 5:

Hierarchical Data Transfer Across Parts of the Structure

1. Which cost center is assigned to functional location ##?
2. The complete functional location structure (apart from ##-SLC – the part for sludge processing) should be assigned to cost center 4100.

How do you prevent this part of the structure (##-SLC) from being assigned to the new cost center?

3. What is the simplest way of assigning the new cost center to the remaining functional locations in the structure ##?

Continued on next page

Task 6:

Horizontal Data Transfer

1. Create the functional location structure T## as an overall structure from the reference location structure R## that you created previously.

How do you proceed?

2. Check whether the information from the reference locations has been transferred to the functional locations. Which data is transferred?

Task 7:

Optional exercise for Customer Service

1. Creating Functional Locations

Call up the function *Create functional location*.

Select the structure indicator SERV2 and choose *Refresh screen* so that the edit mask and hierarchy levels are displayed correctly.

Create a functional location with the number HTEC## and functional location category S.

Enter the following data:

Description: Hitech Corp. Hamburg

Create an individual address for the functional location.

| Field Name or Data Type | Values |
|---------------------------------------|---------|
| <i>Planning plant:</i> | 1200 |
| <i>Sold-to party:</i> Customer number | T-CSD## |

Continued on next page

| | |
|------------------------------|------|
| <i>Sales organization:</i> | 1000 |
| <i>Distribution channel:</i> | 14 |
| <i>Division:</i> | 00 |

Save the functional location master record.

2. Creating Subordinate Functional Locations

Create a functional location with the number HTEC##-SHIP, structure indicator SERV2 and functional location category S.

Enter your functional location HTEC## as a copy model. Copy all the sub-objects proposed.

Change the description to **Hitech Hamburg Shipping Center**.

Which functional location is proposed as the superior functional location based on the functional location number entered?

Solution 1: Functional Locations

Task 1:

General Questions About Functional Locations:

1. Is the structure indicator unique across the system?

Answer: The structure indicator is unique across **all clients** but **not** across all systems.

2. How do you proceed if you have assets (functional locations) with the same ID (= number) in several plants?

Answer: We recommend using the plant's identification number as the first level of the functional location structure.

3. Which functions can be executed with functional locations and reference locations?

| Function | Functional Location | Reference Location |
|--------------------------|---------------------|--------------------|
| Install equipment | | |
| Create order | | |
| Assign measuring point | | |
| Classification | | |
| Assign documents | | |
| Enter multilingual texts | | |

a)

| Function | Functional Location | Reference Location |
|--------------------------|---------------------|--------------------|
| Install equipment | Yes | No |
| Create order | Yes | No |
| Assign measuring point | Yes | No |
| Classification | Yes | Yes |
| Assign documents | Yes | Yes |
| Enter multilingual texts | Yes | Yes |

Continued on next page

Task 2:

Entering Reference Locations

The reference location structure displayed in the following table should be represented in the system.

For this, you first have to define a suitable structure indicator in Customizing.

Then you enter the reference locations in the specified sequence while observing the respective hierarchy level.

| Reference Location | Description | Level | Superior reference location |
|--------------------|---------------|----------|-----------------------------|
| R## | System ## | 1. Level | ? |
| R##-A | Area A | 2. Level | ? |
| R##-B | Area B | 2. Level | ? |
| R##-1 | Area 1 | 2. Level | ? |
| R##-12 | Sub-area 2 | 3. Level | ? |
| R##-123-A | Subfunction A | 5. Level | ? |
| R##-123 | Function 3 | 4. Level | ? |
| R##-123-B | Subfunction B | 5. Level | ? |
| R##-123-AA | Item A | 6. Level | ? |

1. Create a suitable structure indicator Gr## while observing the following requirements.

The system always has three characters and is represented alphanumerically (1st level).

The areas of the system are represented alphanumerically (2nd level).

The sub-areas are represented numerically (3rd level).

The functions are represented numerically (4th level).

The subfunctions and items are represented alphabetically (5th/6th level).

Continued on next page

How do you proceed?

- a) Structure Indicator

SAP menu → Tools → Customizing → IMG → Execute Project

Button SAP Reference IMG

*Plant Maintenance and Customer Service → Master Data in
Plant Maintenance and Customer Service → Technical Objects →
Functional Locations → Create Structure Indicator for Reference
Locations/Functional Locations*

Button New Entries

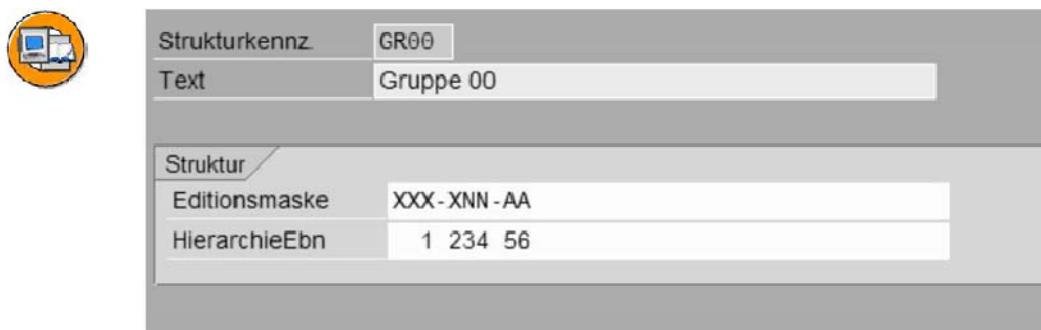


Figure 16: Structure Indicator Solution

2. Create the reference location hierarchy specified above using your structure indicator Gr##.

How do you proceed?

Use the following data:

Continued on next page

| Description | System ## |
|--------------------------------------|-----------|
| Planning plant | 1000 |
| Planner group | I## |
| Responsible work center | T-ME## |
| Plant of the responsible work center | 1000 |

- a) Entering Reference Locations

SAP Menu → Logistics → Plant Maintenance → Management of Technical Objects → Functional Location → Reference Location → Create

| Reference location | Superior reference location |
|--------------------|-----------------------------|
| R## | |
| R##-A | R## |
| R##-B | R## |
| R##-1 | R## |
| R##-12 | R##-1 |
| R##-123-A | R##-12 |
| R##-123 | R##-12 |
| R##-123-B | R##-123 |
| R##-123-AA | R##-123-A |

3. Which reference location has an “incorrect” superior reference location?

- a) If you use transaction IL11 to create the reference functional locations, then the superordinate reference location for ##-123-A is “incorrect”.

However, if you use transaction IL14 (List Editing) to create the reference locations, the problem does not arise.

Continued on next page

4. How can you correct this?
 - a) To change the “incorrect” superordinate reference location, proceed as follows:

SAP Menu → Logistics → Plant Maintenance → Management of Technical Objects → Functional Location → Reference Location → Change

Enter ##-123-A

Structure Change Installation Location

Enter ##-123.

Task 3:

Copying Parts of Structures

1. In the structure of functional location ##, part of the structure is for sludge processing.

Which functional locations belong to this part?

- a) *SAP Menu → Logistics → Plant Maintenance → Management of Technical Objects → Functional Location → Structural Display*

Entering a Functional Location Label: ##

Execute (F8)

##-SLB, ##-SLB-1, ##-SLB-11, ##-SLB-12, ##-SLB-2, ##-SLB-21, ##-SLB-22, ##-SLB-3, ##-SLB-31, ##-SLB-32

2. Which structure indicator does the system ## use?

- a) Starting from the structure display (see previous step of exercise), double-click on the uppermost functional location ##; *Structure* tab page

Structure Indicator **STR03**

3. In the clarification plant there is another part for sludge processing with the number ##-SLC, which you want to look exactly the same in the structure as the sludge processing mentioned above.

Continued on next page

How do you proceed in order to insert this part of the structure as easily as possible?



Hint: Make sure you use the correct structure indicator!

- a) *SAP Menu → Logistics → Plant Maintenance → Management of Technical Objects → Functional Location → List Editing → Create*

Set structure indicator STR03

Button *Copy reference*

Functional Location ##-SLB

New Location Structure ##-SLC

4. Structural Display

Display the structure of functional location ## in list form and as a graphic. Which menu path do you choose?

Answer: *SAP Menu → Logistics → Plant Maintenance → Management of Technical Objects → Functional Location → Structural Display*

Task 4:

Hierarchical Data Transfer Across the Complete Structure

1. To which main work center and maintenance planner group is functional location ## assigned?
 - a) Work center MECHANIC and maintenance planner group 100
2. Enter your work center T-ME## and your maintenance planner group I##. What system message is issued when you save?
 - a) Data transferred to xx functional locations and yy pieces of equipment
3. Check whether the information has been transferred to all the subordinate functional locations.

What is the easiest way of doing this?

- a) *SAP Menu → Logistics → Plant Maintenance → Management of Technical Objects → Functional Location → List Editing → Display*

Continued on next page

Task 5:

Hierarchical Data Transfer Across Parts of the Structure

1. Which cost center is assigned to functional location ##?
 - a) 4110
2. The complete functional location structure (apart from ##-SLC – the part for sludge processing) should be assigned to cost center 4100.

How do you prevent this part of the structure (##-SLC) from being assigned to the new cost center?

- a) *SAP Menu → Logistics → Plant Maintenance → Management of Technical Objects → Functional Location → Change*

##-SLC

Cursor on the Cost Center field

Menu bar: Edit → Data Origin: select 'Individual maintenance'.

3. What is the simplest way of assigning the new cost center to the remaining functional locations in the structure ##?

- a) *SAP Menu → Logistics → Plant Maintenance → Management of Technical Objects → Functional Location → Change*

##

Organization tab page and enter cost center 4100

Check the result.

Task 6:

Horizontal Data Transfer

1. Create the functional location structure T## as an overall structure from the reference location structure R## that you created previously.

Continued on next page

How do you proceed?

- a) *SAP Menu → Logistics → Plant Maintenance → Management of Technical Objects → Functional Location → List Editing → Create*
 Set structure indicator *Gr##*
 Button *Reference model*
 Reference location *R##*
 New location structure *T##*
2. Check whether the information from the reference locations has been transferred to the functional locations. Which data is transferred?
 - a) Description and Maintenance Data

Task 7:

Optional exercise for Customer Service

1. Creating Functional Locations

Call up the function *Create functional location*.

Select the structure indicator SERV2 and choose *Refresh screen* so that the edit mask and hierarchy levels are displayed correctly.

Create a functional location with the number HTEC## and functional location category S.

Enter the following data:

Description: Hitech Corp. Hamburg

Create an individual address for the functional location.

| Field Name or Data Type | Values |
|---------------------------------------|---------|
| <i>Planning plant:</i> | 1200 |
| <i>Sold-to party:</i> Customer number | T-CSD## |

Continued on next page

| | |
|------------------------------|------|
| <i>Sales organization:</i> | 1000 |
| <i>Distribution channel:</i> | 14 |
| <i>Division:</i> | 00 |

Save the functional location master record.

- a) *Logistics Customer Service Management of Technical Objects*
Functional Location Create

| Field Name or Data Type | Values |
|-------------------------|--------|
| <i>StrIndicator</i> | SERV2 |

Refresh

| Field Name or Data Type | Values |
|-------------------------|--------|
| <i>FunctLocation</i> | HTEC## |
| <i>FunctLocCat</i> | S |

Enter

| Field Name or Data Type | Values |
|-------------------------|-----------------------------|
| <i>Description</i> | <i>Hitech Corp. Hamburg</i> |

Location

Choose the function *Create* in the screen area *Address*.

Enter an address and choose *Copy*.

Organization

Continued on next page

| Field Name or Data Type | Values |
|-------------------------|--------|
| <i>Planning plant</i> | 1200 |

Partner

| Field Name or Data Type | Values |
|-------------------------|-------------------------|
| <i>Role</i> | SP |
| <i>Partner</i> | <i>Customer T-CSD##</i> |

Sales and distribution

| Field Name or Data Type | Values |
|-----------------------------|--------|
| <i>Sales organization</i> | 1000 |
| <i>Distribution channel</i> | 14 |
| <i>Division</i> | 00 |

Save

2. Creating Subordinate Functional Locations

Create a functional location with the number HTEC##-SHIP, structure indicator SERV2 and functional location category S.

Enter your functional location HTEC## as a copy model. Copy all the sub-objects proposed.

Change the description to **Hitech Hamburg Shipping Center**.

Continued on next page

Which functional location is proposed as the superior functional location based on the functional location number entered?

- a) *Logistics Customer Service Management of Technical Objects*
Functional Location Create

| Field Name or Data Type | Values |
|--------------------------------------|--------------------|
| <i>FunctLocation</i> | <i>HTEC##-SHIP</i> |
| <i>Structure Indicator</i> | <i>SERV2</i> |
| <i>FunctLocCat</i> | <i>S</i> |
| <i>Copy from functional location</i> | <i>HTEC##</i> |

Enter

Confirm the following dialog box using *Continue*.

| Field Name or Data Type | Values |
|-------------------------|------------------------|
| <i>Description</i> | <i>Hitech Hamburg</i> |
| <i>Structure</i> | <i>Shipping center</i> |

Functional location HTEC## is proposed as the superior functional location.



Lesson Summary

You should now be able to:

- Enter complete location structures quickly
- Use data transfer
- Use reference locations

Lesson: Alternative Labeling

Lesson Overview

This lesson shows how to change the primary label of a functional location.



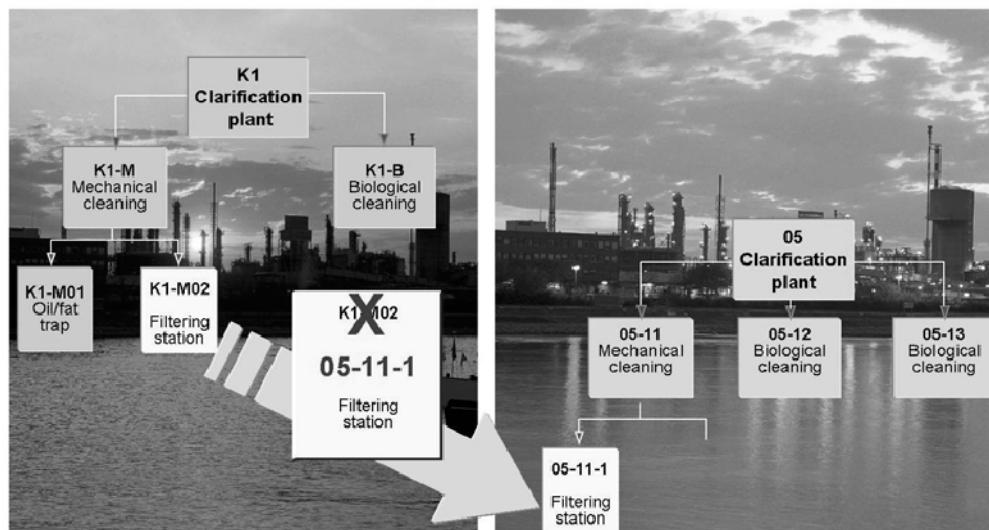
Lesson Objectives

After completing this lesson, you will be able to:

- Create alternative labels
- Work with alternative labeling systems

Business Example

The system engineer accidentally entered a functional location with an incorrect label. You want to correct it without making a new entry.



Changing the location number

Classify in new hierarchy

Figure 17: Alternative Labeling of Functional Locations I

In alternative labeling of functional locations, you can change labels for functional locations.

This change can contain the “renumbering” of a functional location, that is, changing the primary key, or the definition of an additional view that displays the object using a different numbering scheme.

When the primary label is changed, you are asked whether the renumbered functional location should be classified in a new hierarchy (if available).

Important note:

The alternative labeling must be activated in Customizing. It is not active in the standard system. It should be comprehensively tested before being used, since it can affect system performance.

To optimize performance, the report RI_IFLOT2IFLOS (using transaction SE38) should be executed after the alternative labeling has been activated.

You can also deactivate alternative labeling again. However, the system is not reset to its initial status before the activation. In certain cases, this may lead to poorer system performance.

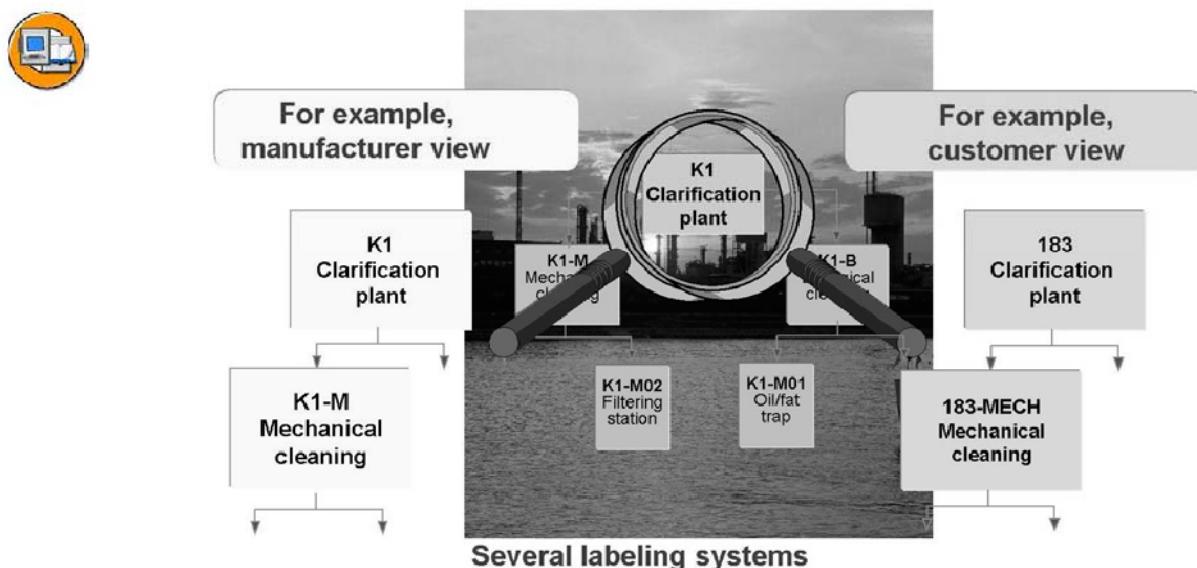


Figure 18: Alternative Labeling of Functional Locations II

The **alternative labeling** of functional locations enables you to use different labeling systems for the same hierarchy. For example, the manufacturer of a technical system can work with a labeling system that is different from the one used by the customer.

Although **alternative labeling systems** are available through an internal **structure indicator**, they do not affect the structure of the object. The structure is determined by the **primary labeling system**.

The labeling system is defined in Customizing. The selection of the appropriate labeling system is controlled by a **user profile**, in which the required views can be created and activated.

Exercise 2: Alternative Labeling

Exercise Objectives

After completing this exercise, you will be able to:

- Change the primary label of a functional location and define alternative views

Business Example

The system engineer accidentally entered a functional location with an incorrect label. You want to correct it without making a new entry.

Task 1:

Alternative labeling (changing the primary key)

The waste water measurement in the intake pumping station in your clarification plant ## is being relocated to your pumping station ##-B01. You want to use alternative labeling to do this.

1. What steps must be executed in Customizing?
2. Assign the new primary label ##-B01-3 for your waste water measurement and reassign the functional location in the structure. How do you proceed?
3. Check whether the functional location was reassigned.

Continued on next page

Task 2:

Alternative labeling (definition of an additional view)

You are the manager of clarification plant ##, which has been supplied by the manufacturer and should be put into operation as soon as possible. You perform a number of tests in the manufacturer's system.

The manufacturer has already created a structure of functional locations to support the manufacturing process. However, the labeling system used does not completely meet your requirements.

You would like to use the existing structure, with the exception that the second and third levels of the technical system contains a numerical label (001 – 009).

First create a new structure indicator ALT##.

Then define a labeling system that meets this requirement.

1. The new structure indicator ALT## should be defined so that only numerical entries are possible at the second and third hierarchy levels.

How do you proceed?

2. Define an alternative label *Own view* for the primary view of the manufacturer.
How do you proceed?

Activate the alternative labeling function.

3. Which functional locations must be changed?
4. Display the technical system from the newly defined view.

How do you proceed?

Switch to the manufacturer view. How do you proceed?

Solution 2: Alternative Labeling

Task 1:

Alternative labeling (changing the primary key)

The waste water measurement in the intake pumping station in your clarification plant ## is being relocated to your pumping station ##-B01. You want to use alternative labeling to do this.

1. What steps must be executed in Customizing?
 - a) Activate alternative labeling for functional locations
2. Assign the new primary label ##-B01-3 for your waste water measurement and reassign the functional location in the structure. How do you proceed?
 - a) *SAP Menu → Logistics → Plant Maintenance → Management of Technical Objects → Functional Location → Change*
Call up functional location ##-ZPW-3.
Extras → Alternative Labeling → Overview;
Select the label "IDES AG" and choose the "Change label" button
Enter the new number ##-B01-3 and confirm
Confirm the pop-up query whether the functional location should be assigned.
3. Check whether the functional location was reassigned.
 - a) *SAP Menu → Logistics → Plant Maintenance → Management of Technical Objects → Functional Location → Structural Display*
Display ##-B01

Continued on next page

Task 2:

Alternative labeling (definition of an additional view)

You are the manager of clarification plant ##, which has been supplied by the manufacturer and should be put into operation as soon as possible. You perform a number of tests in the manufacturer's system.

The manufacturer has already created a structure of functional locations to support the manufacturing process. However, the labeling system used does not completely meet your requirements.

You would like to use the existing structure, with the exception that the second and third levels of the technical system contains a numerical label (001 – 009).

First create a new structure indicator ALT##.

Then define a labeling system that meets this requirement.

1. The new structure indicator ALT## should be defined so that only numerical entries are possible at the second and third hierarchy levels.

How do you proceed?

- a) *SAP menu → Tools → Customizing → IMG → Execute Project*

Button *SAP Reference IMG*

Plant Maintenance and Customer Service → Master Data in Plant Maintenance and Customer Service → Technical Objects → Functional Locations → Create Structure Indicator for Reference Locations/Functional Locations

For example, the structure indicator STR03 can be used as the basis and the second level amended accordingly: XX-NNN-XX/X

2. Define an alternative label *Own view* for the primary view of the manufacturer.
How do you proceed?

Continued on next page

Activate the alternative labeling function.

- a) *SAP menu → Tools → Customizing → IMG → Execute Project*

Plant Maintenance and Customer Service Master Data in Plant Maintenance and Customer Service Technical Objects Functional Locations Alternative Labeling of Functional Locations Define Labeling Systems for Functional Locations

Define labeling systems for functional locations

Enter the label *Own view*

then

- SAP menu → Tools → Customizing → IMG → Execute Project*

Plant Maintenance and Customer Service Master Data in Plant Maintenance and Customer Service Technical Objects Functional Locations Alternative Labeling of Functional Locations Activate Alternative Labeling.

3. Which functional locations must be changed?

- a) Using the structural display for the functional location to determine which locations are at the second level:

SAP Menu → Logistics → Plant Maintenance → Management of Technical Objects → Functional Location → Structural Display

##-ZPW, ##-M, ##-B, ##-KWT, ##-SLB, ##-CNT, ##-KGV, ##-VBR, ##-HZA

Changing master records:

Starting from the structure display, double-click on the respective functional location, then *Extras → Alternative Labeling → Overview*;

Change the label *Own view*

Select the structure indicator and press the Refresh button; enter the new number, such as ##-001

4. Display the technical system from the newly defined view.

How do you proceed?

Continued on next page

Switch to the manufacturer view. How do you proceed?

- a) Creating a user profile using:

SAP Menu → Logistics → Plant Maintenance → Management of Technical Objects → Functional Location → Labels → User Profile

Define the number and the description, then enter the labeling system and the structure indicator (as defined in Customizing)

Call the structure display of the functional location ##; the second level is now displayed in the new view



Lesson Summary

You should now be able to:

- Create alternative labels
- Work with alternative labeling systems

Lesson: Customizing and Customer Exits for Functional Locations

Lesson Overview

This lesson shows the settings required in IMG for working with functional locations. It also includes options for customer enhancements.



Lesson Objectives

After completing this lesson, you will be able to:

- Make all the necessary Customizing settings
- List the options for customer enhancements

Business Example

The project team must decide how many different categories of functional location and how many structure indicators will be used.

The categories and structure indicators must be defined in Customizing.

Customizing for Functional Locations



• Structure Indicator

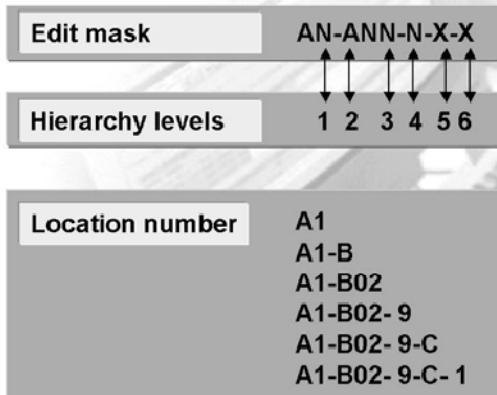


Figure 19: Structure Indicator

The edit screen defines the following:

Total length of functional location label

Length of individual sections of functional location label

Characters allowed

Edit screen N for numbers

Edit screen A for letters

Edit screen X for numbers and letters

The characters allowed can be defined for each field.

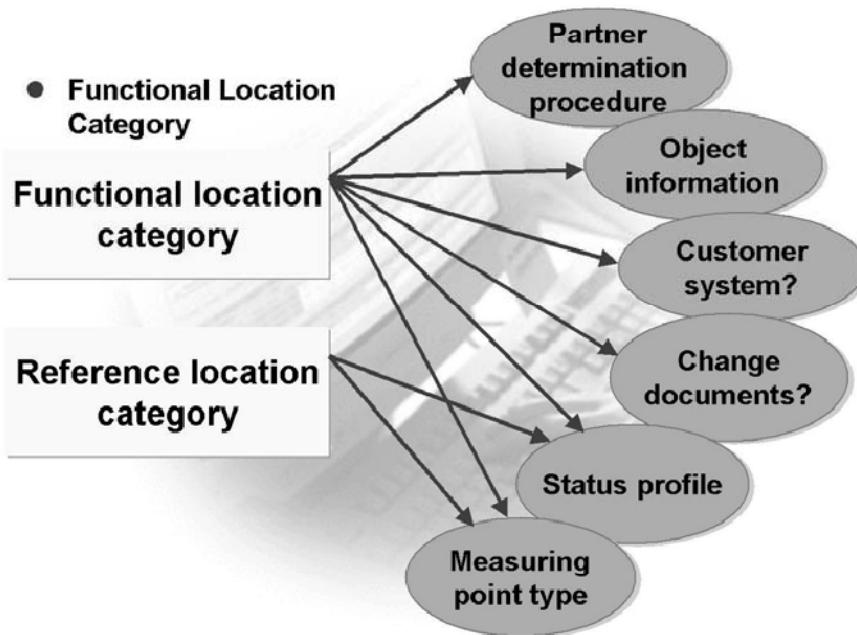


Figure 20: Functional Location Category

You can define the following information for each category of functional location:

Status profile

Partner determination procedure

Default value for measuring point types

Field selection

Whether change documents are generated

Whether a functional location for a customer is involved

Key that defines the layout of the dialog box for object information

When a reference functional location makes reference to a “real” functional location, the categories of the two locations can differ. If you do not require a particular field selection or specific default values for the reference functional location, you do not need to create new categories of reference functional location.



- **Set up list editing for functional locations**
- **Set up list editing for reference functional locations**

Figure 21: List Editing

Here, you can define the possible selection fields, enter concrete values in the selection fields and make the field selection for the list display.

When choosing the selection fields, you can assign certain attributes to the selection fields. The attributes signify the following:

Protected: This field is displayed on the selection screen but is not ready for input. For example, you have entered a value in a selection field which should not be changed by the user.

Invisible: This field is hidden on the selection screen and cannot be used as a selection criterion.

Variable: A variable, not a concrete value, is entered in this field. For example, selection should always be made over a certain period of time (for example, current month). In this case, you would enter the variable *Current month*. The current month would then be proposed automatically as a selection criterion.



- **Activate alternative labeling**
- **Define labeling systems**

Figure 22: Alternative Labeling

This function is possible because the key for the functional location is independent of the display of labeling on the screen. This means that you can contact the same functional location using different labels. The program uses an unique, internal number for this which is not visible to the end user.

When you activate this function, the label of the functional location is lengthened from 30 to 40 characters and can be changed. If the label is changed, the system automatically creates a labeling history and prevents uncontrolled re-use of historical labels. The labeling history also enables historical location labels to be interpreted in non-modifiable documents outside of the SAP System.

The alternative labeling function is not active in the standard system. To optimize performance, you should execute the program RI_IFLOT2IFLOS after you have activated the alternative labeling function. You can still define whether the labeling of a system should be checked for uniqueness across all identification systems. Uniqueness is always checked within a labeling system.

You must select one of the labeling systems as a primary labeling system. This should be the system used by the majority of users. The users can switch between the different labeling systems by means of user profiles. Those users who have not created their own user profile automatically work with the primary labeling system.

Customer Exits for Functional Locations



- Customer-specific processing when saving a functional location, for example:
 - User-defined data checks
 - Changes to particular field contents

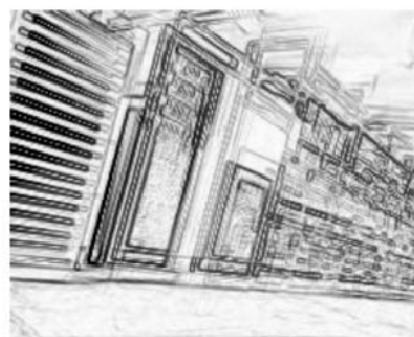


Figure 23: Customer Exit ILOM0001



- Customer-specific checks when creating functional locations (function module EXIT_SAPLIOS_001)
- Location number can be changed directly
- Model coding in standard system:
Internal number assignment
for the last part
of the location

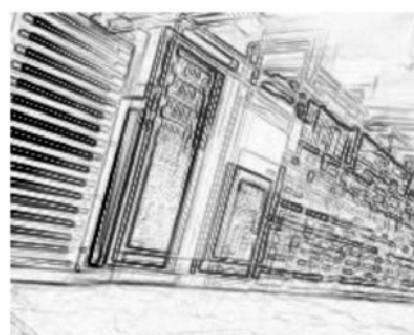


Figure 24: Customer Exit ILOM0002

Exercise 3: Customizing and Customer Exits for Functional Locations

Exercise Objectives

After completing this exercise, you will be able to:

- Create structure indicators
- Define categories for functional locations
- Enter settings for categories

Business Example

The project team must decide how many different categories of functional location and how many structure indicators will be used.

The categories and structure indicators must be defined in Customizing.

Task:

Customizing:

1. Which functions are determined by the category of the functional location?

Solution 3: Customizing and Customer Exits for Functional Locations

Task:

Customizing:

1. Which functions are determined by the category of the functional location?
 - a) Functions:
 - Whether change documents should be created
 - Which status profile is assigned as default
 - Whether a customer asset is involved
 - What type of object information should be called up in the notification and order
 - Which partner determination procedure is assigned as default
 - What category the measuring points should be assigned



Lesson Summary

You should now be able to:

- Make all the necessary Customizing settings
- List the options for customer enhancements



Unit Summary

You should now be able to:

- Enter complete location structures quickly
- Use data transfer
- Use reference locations
- Create alternative labels
- Work with alternative labeling systems
- Make all the necessary Customizing settings
- List the options for customer enhancements

Unit 2

Equipment

Unit Overview

This chapter follows on from the chapter *Technical Objects* in the course PLM300, recapitulates the term and concept of equipment and then expands on the application of equipment with a whole range of detailed functions and their related Customizing settings.



Unit Objectives

After completing this unit, you will be able to:

- Identify the usage options for equipment
- Create and maintain equipment master records
- Understand changes to the equipment master record
- Classify pieces of equipment
- Search for pieces of equipment using the classification
- Make the necessary Customizing settings for pieces of equipment
- List the options for customer enhancements

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Lesson: Using Equipment

Lesson Overview

This lesson shows you the various options for using equipment.



Lesson Objectives

After completing this lesson, you will be able to:

- Identify the usage options for equipment
- Create and maintain equipment master records
- Understand changes to the equipment master record

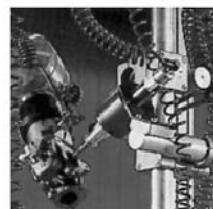
Business Example

The project team wants to represent important and expensive individual pieces of machinery such as pumps and motors, and decides to use equipment to represent them.

Usage Options



Equipment category: Machine



Equipment category: Production resources and tools



Equipment category: Fleet object



Equipment category: Measuring and test equipment

Figure 25: Autonomous Equipment

You can use pieces of equipment to represent objects that are autonomous and not dependent on a hierarchy.

Structuring is performed using the **equipment category** (for example, machines, fleet objects, production resources/tools, customer equipment).

To structure equipment categories in greater detail, you can use the **object type** (also for functional locations).

Example:

Equipment category: Fleet object

Object types: Car, truck, motorbike and so on

In some cases, special views can be added to the master record in addition to structuring by equipment category and object type, for example, for production resources/tools and fleet objects.

Production resources and tools: A production resource/tool (PRT) is a moveable operating resource (such as a tool, a measuring device) used in Plant Maintenance and Production. PRTs can be pieces of equipment, materials or documents and are assigned to the operation within the maintenance order. You can make status checks, availability checks, and usage overviews in maintenance processing.

Production resources/tools have an additional view PRT Data, in which you can make entries about task list usage or set the status of the production resources/tools to Locked.



- Identification data
- Dimension data
- Transport data
- Task list data
- Engine data
- Fuel and lubrication data

Figure 26: Special Case – Autonomous Equipment: Fleet object

Fleet objects include cars, trucks, airplanes, trains, ships, building machinery and transport containers. A fleet object can be displayed as an equipment master record with fleet object-specific views. As a piece of equipment, a fleet object can be a reference object for a notification or an order.

You can store the following fleet object-specific data:

- Identification data (such as number plate, chassis number)
- Dimension data (height, width, length)
- Transport-relevant data (weight, maximum load, loading volume)
- Planning data (counter reading data)
- Other features (fuel card number, key number)
- Engine data (engine type, engine performance, r.p.m., cubic capacity)
- Fuel and lubricant data (fuel type, oil type)

There is an individual transaction for creating a piece of equipment as a fleet object (IE31). An individual node is available for fleet object management in the Customizing for technical objects.

For the list processing of fleet objects, you have the option of selecting by fleet-specific data. You can, for example, select by fleet object type, license plate number, or technical data, and display fleet-specific and consumption-relevant data in the results list.

This selection option is also available in the notification and in the order.

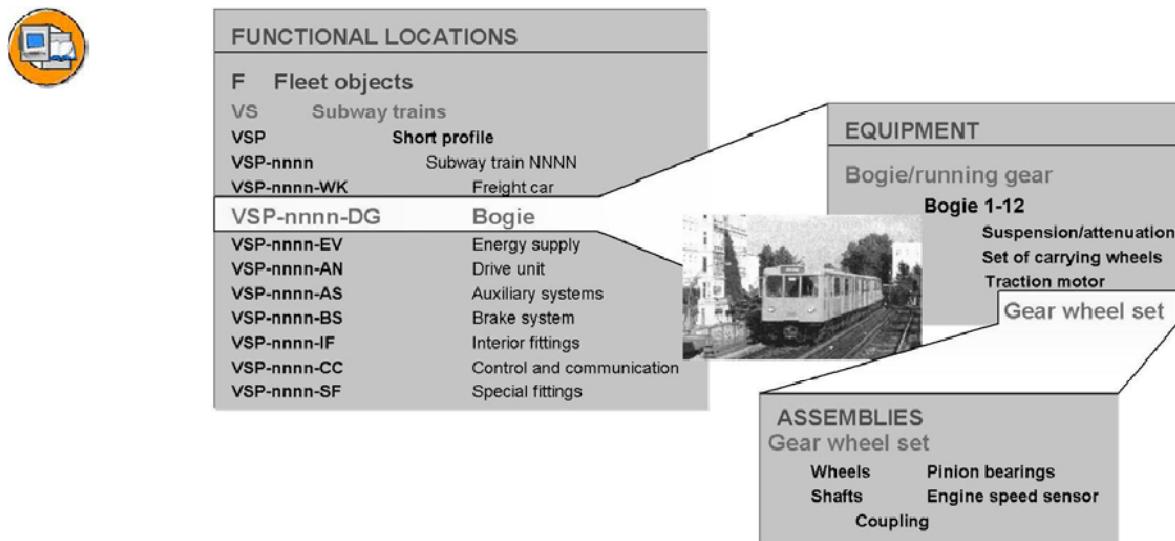


Figure 27: Equipment and Functional Location

The combination of hierarchical system or object structure and the autonomous object view represents the **installation of a piece of equipment at a functional location**.

The installation location of an object/aggregate and the installed object itself can be represented separately in the system. This differentiation allows a separate tracking of damages, that is, documenting whether the damage stems from the conditions at the installation location (=functional location) or perhaps from the inferior quality of the installed object (= object). In this case, the cause of damage would either be updated to the functional location or the piece of equipment.

The usage times can be recorded from the equipment view (= where was the equipment installed) and the functional location view (= which pieces of equipment were installed at this functional location).

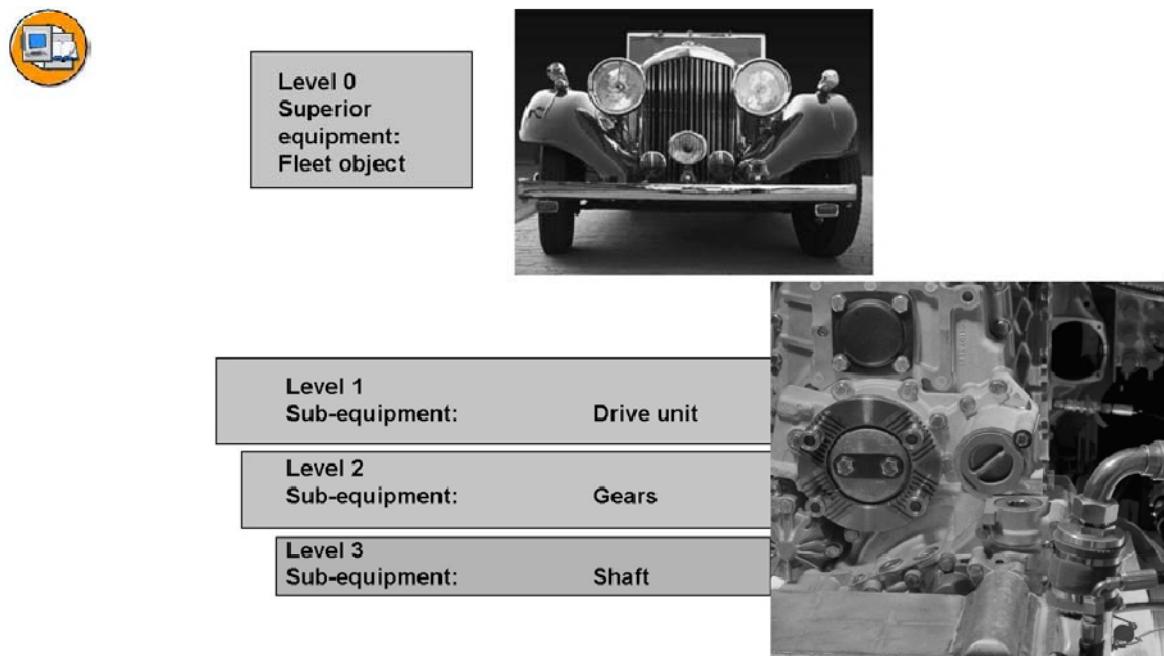


Figure 28: Autonomous Equipment Hierarchy

You can use equipment hierarchies if the use of functional locations is not supported in your company or individual moveable aggregates have a complex structure.

The equipment hierarchy differs from a functional location hierarchy in that it is not controlled by a structure indicator, so no relationship exists between the equipment numbers in a hierarchy. Moreover, in the Plant Maintenance Information System, costs cannot be summarized at the level of the top equipment for the hierarchy beneath.

Equipment hierarchies can be structured to suit individual requirements. In contrast to the installation at the functional location, there are no installation specifications for installing in another piece of equipment, in other words, pieces of equipment that cannot be installed at a functional location can be installed in another piece of equipment.

Data transfer from the superior equipment to the subordinate equipment equates with data transfer from the functional location to the equipment (see topic *Data Transfer* in the unit on *Functional Locations*).

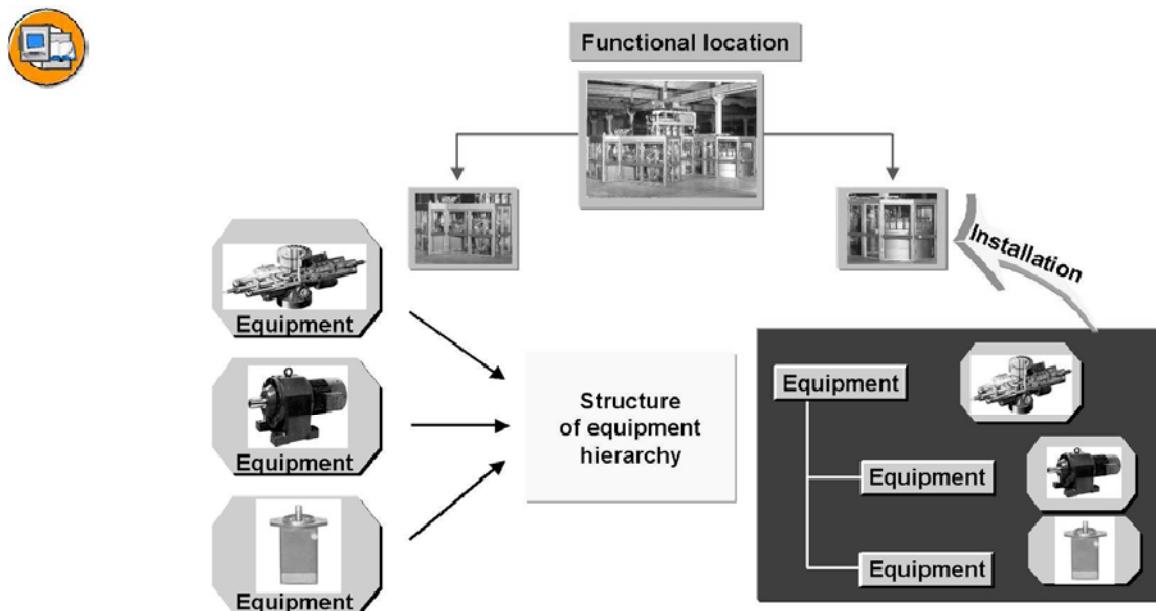


Figure 29: Equipment Hierarchy and Functional Location

You can install equipment hierarchies as individual pieces of equipment at functional locations. Data is transferred according to the same principle as between functional locations and pieces of equipment or for equipment hierarchies.

If the equipment usage periods are displayed at the functional location, the pieces of equipment and entire hierarchy can be seen at the top of an equipment hierarchy.

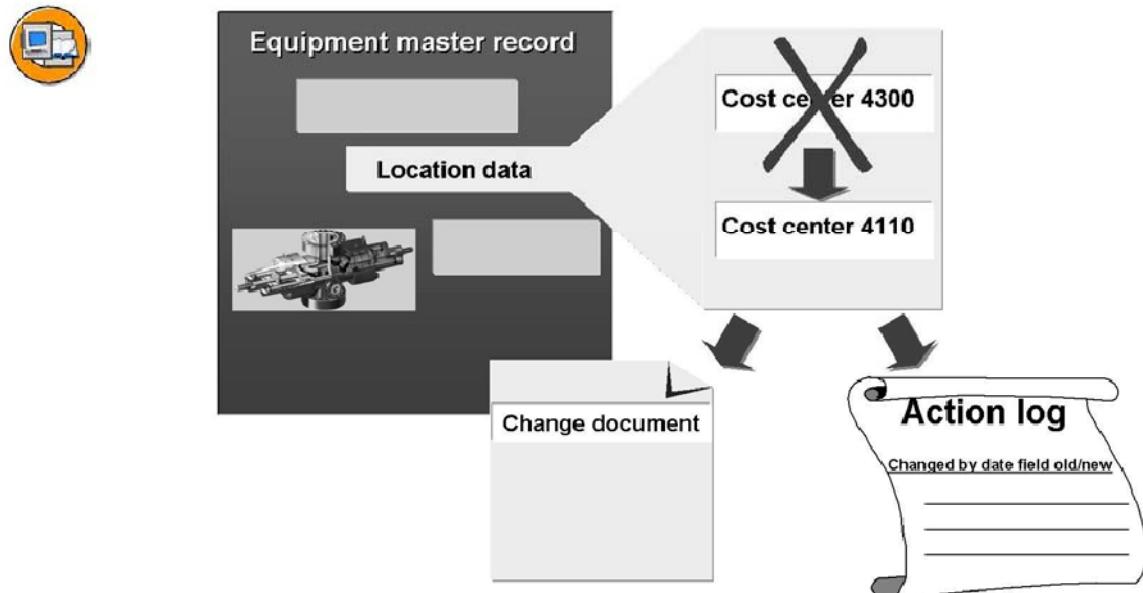


Figure 30: Documenting Changes

Changes to master records are documented as a change document. Each change is recorded in a separate document and contains a document number.

Equipment and Asset Accounting

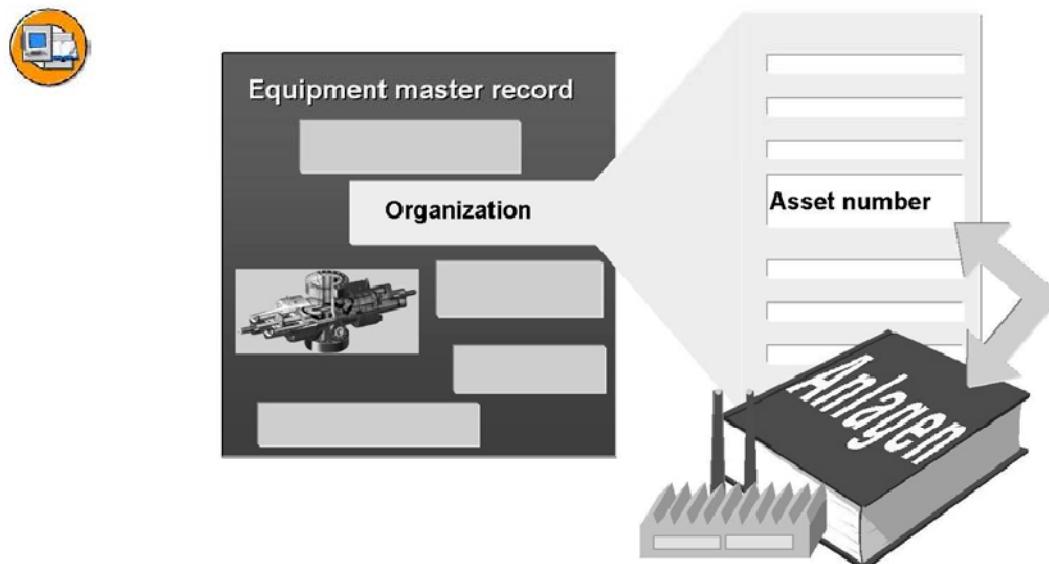


Figure 31: Equipment and Asset Accounting

To assign pieces of equipment to an asset, you can define an asset number in the equipment master record.

In addition to change documents, it is also possible to display all changes for a particular view with old and new field contents in an action log.

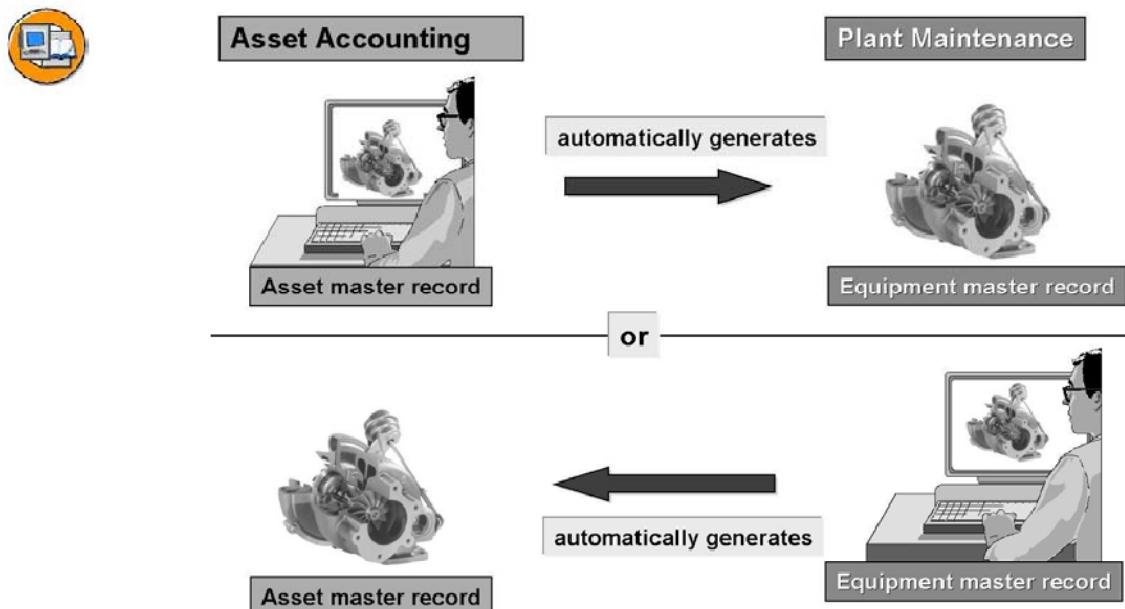


Figure 32: Maintenance – Asset Accounting Link

If integration between asset accounting and plant maintenance is activated in Customizing, equipment can be created automatically when creating a technical system. Asset class settings are used for controlling (for example, which equipment type is used).

Alternatively, you can define that an asset is created automatically when a piece of equipment is created, or that the asset master record is changed when the equipment master record is changed.

Integration can be realized as direct synchronization or as workflow.

You ensure data consistency in both asset and equipment by defining that fields in the equipment master record must also be updated when changes are made to the asset master record.

Configuration Control

The configuration control allows you to compare the current assembly condition of a technical object (such as an airplane) with the target condition in order to determine whether the technical object has a valid configuration.

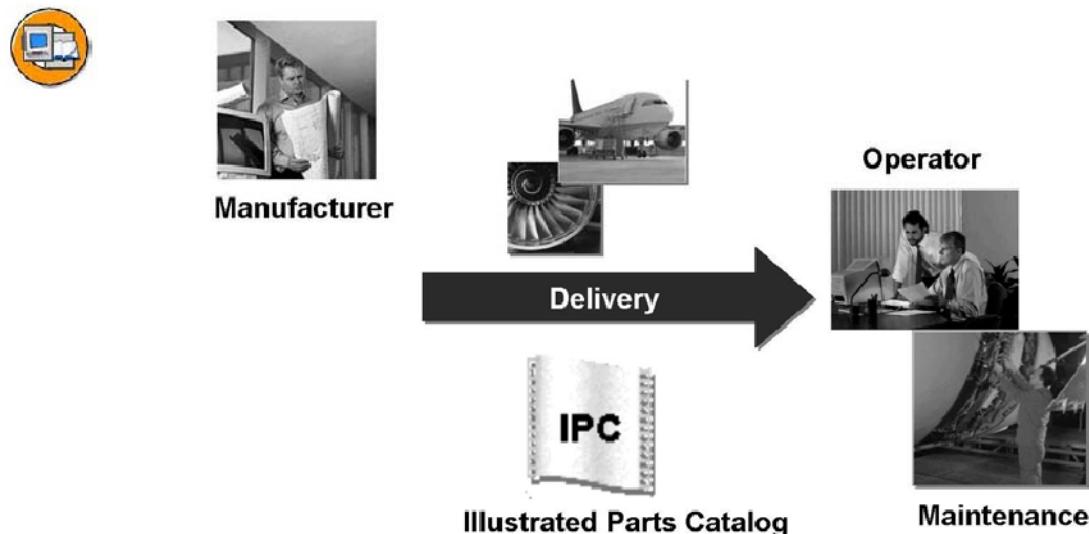


Figure 33: Configuration Control

The airplane manufacturer supplies with the airplane the complete technical documentation for operating and maintaining the airplane.

Part of the technical documentation is the **Illustrated Parts Catalog – IPC**, which includes all the valid (spare) parts that may be installed in the airplane. The airplane maintenance must be carried out in accordance with the IPC, which means that only IPC-approved (spare) parts can be installed in the airplane.

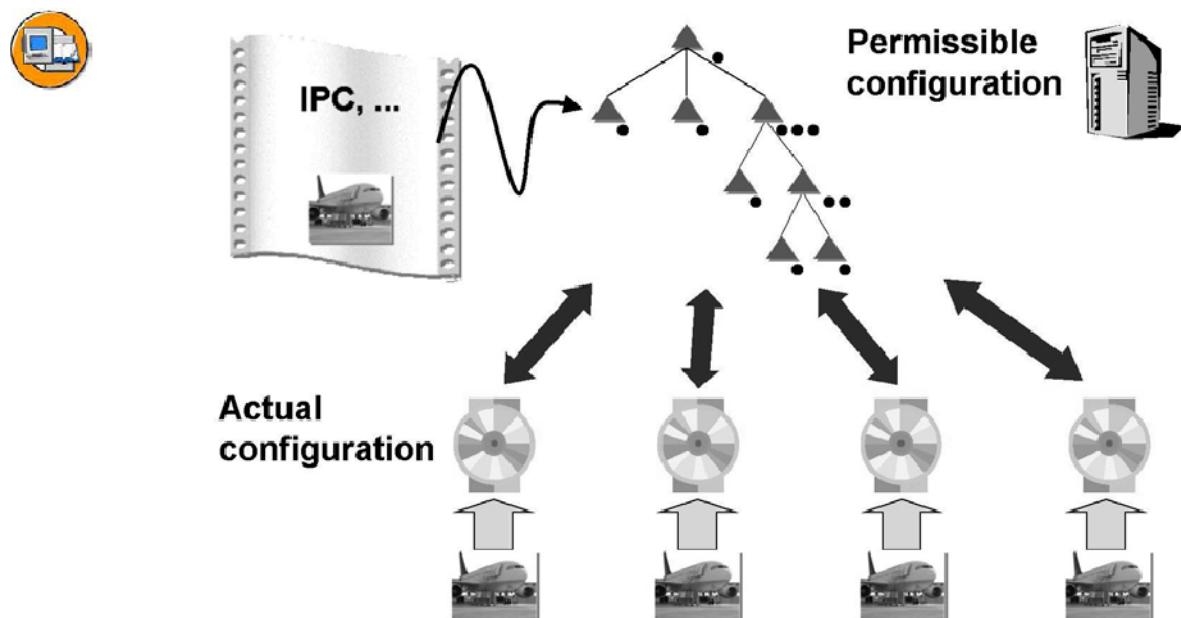


Figure 34: Configuration Data

The actual configuration is the current hierarchy structure of a technical object and can consist of functional locations, pieces of equipment and structure gaps.

In the SAP System, you can use functional locations and pieces of equipment to build a history of the actual configuration of, for example, an airplane. The actual configuration is usually reconciled with the information in the IPC. Some repair and maintenance processes – in the aviation sector, for example – require that the actual configuration of a technical object can be verified at all times. This should ensure that the object has a valid configuration when it leaves the maintenance plant.

The configuration control allows you to compare the actual configuration of a technical object with the **master parts list**, which contains all the relevant data – for airplanes or engines, for example – in the illustrated parts catalog supplied by the manufacturer. The relevant part of the master parts list against which a specific actual configuration is checked, is called the permissible configuration in the SAP System. The permissible configuration is based on the functionality of the **Integrated Product and Process Engineering (iPPE)**.

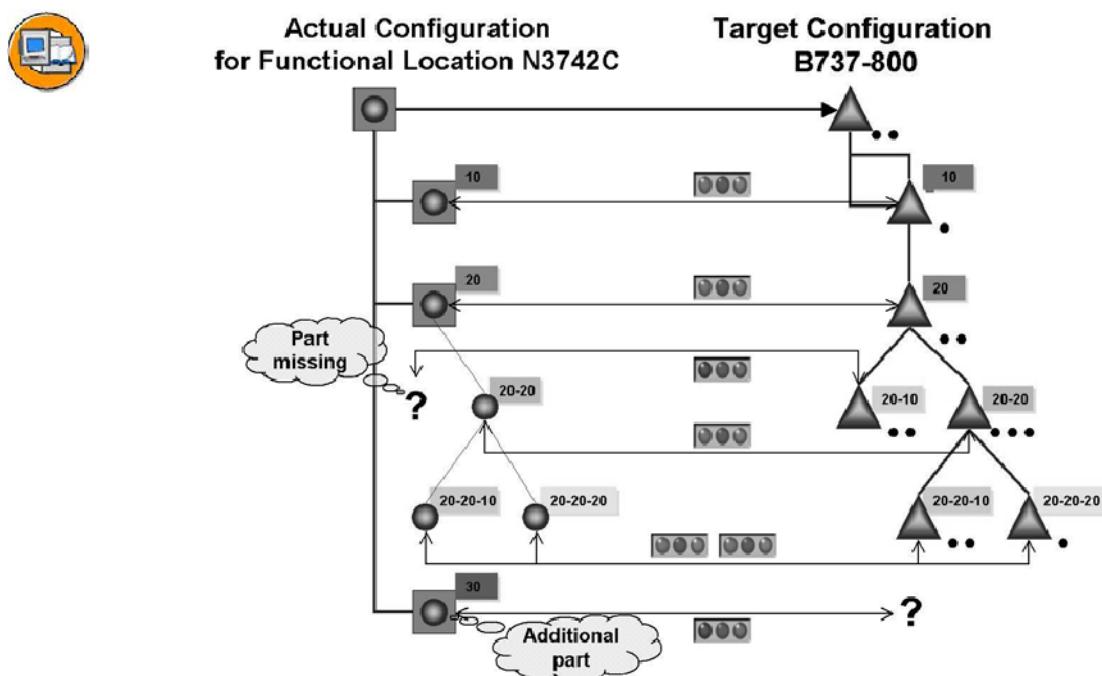


Figure 35: Configuration Check

The configuration control workbench is intended for daily use by technicians and technical planners who work with objects with extremely complicated product structures (such as airplanes, engines and turbines).

The overall configuration check within the configuration control workbench allows you to carry out configuration checks on multivariant products: The system compares the actual configuration (N3742C) of a technical object with the master parts list (B737-800) of the object. The system identifies matching/missing/additional items in both structures.

Exercise 4: Usage Options (Equipment)

Exercise Objectives

After completing this exercise, you will be able to:

- Create a new equipment category with the associated settings
- Create view profiles for equipment categories
- Create a piece of equipment with fleet object data

Business Example

Individual objects for which maintenance tasks should be recorded are represented as pieces of equipment in the enterprise. Different equipment categories should be introduced for machines, pumps, vehicles and so on, to ensure optimal setting of parameters.

Task 1:

A new equipment category for pumps is required.

First check the equipment categories available in Customizing and use a free number from 1 – 9 or letter from A - Z.

Create a new equipment category with the name **Pump group##**.

1. How do you proceed?

Which equipment category have you created?

2. Make the required entries so that change documents are created for the new equipment category and you can obtain object information using the PM key.

How do you proceed?

3. Assign the new equipment category to the number range that already exists in the system.

How do you proceed?

What options do you have for number assignment?

4. Use the relevant Customizing option to create a view profile **Gr##** that contains the following views:

Continued on next page

| Tabstrip | Contents |
|-------------------|---|
| General | General and manufacturer data, reference data, address |
| Organization | Location data, account assignment data, areas of responsibility |
| Structure | Structuring, classification (standard class - part of screen) |
| Additional data 1 | Partners, guarantees, documents (part of screen) |

The *Additional data 1* tab page should be given an appropriate name or a graphic symbol.

How do you proceed?

5. Assign the view profile (created above) to your equipment category.

How do you proceed?

6. Which business views can you activate in addition to the view profile?
7. Allow this equipment category to be installed at the functional location. In addition, define that the usage history be updated when changes are made to the master record.

How do you do this?

8. Create a new equipment master record TET-## using the newly created equipment category.

Enter the following data:

| Field Name or Data Type | Values |
|-------------------------|--------------------------|
| Maintenance plant | 1000 |
| Object type | 1000 (water supply pump) |
| Manufacturer | Merged pump plants |
| Manufacturer serial no. | 12345-6 |
| Category description | XY-0815 |
| Year of construction | 2004 |
| Cost center | 4300 |

Continued on next page

Where do you make these entries?

9. Install your new equipment TET-## at pump station ##-B01-1.

What requirements must be met for a piece of equipment to be installed?

What system status does the equipment have before being installed?

First install the equipment with data transfer from the functional location and copy all the functional location data. How do you proceed?

What system status does the equipment have after being installed?

To which cost center does the equipment belong after it has been installed?

Display the structure of pump station ##-b01 with the installed equipment. How do you proceed?

Task 2:

Optional

1. You are searching for a vehicle with the following criteria:

| | |
|----------------------|-------------------------|
| Loading space height | Up to 2000 mm |
| Loading volume | Up to 12 m ³ |

How do you proceed?

2. Determine the Customizing settings relevant for fleet object management.

Where is the view profile assigned?

What is the connection between fleet object type and equipment category?

3. Create a new fleet object of fleet object type 5000 (car). Assign the maintenance plant 1000 and maintain the individual views.

How do you proceed?

Task 3:

Optional exercises for Customer Service

1. Creating Customer Equipment

Create a piece of equipment with the number EQUI1## and equipment category S.

Continued on next page

Enter the following data:

| Description | Printer |
|----------------------|-------------------------|
| Planning plant | 1200 |
| Sold-to party | Customer number T-CSD## |
| Sales organization | 1000 |
| Distribution channel | 14 |
| Division | 00 |

Save the equipment master record.

2. Creating a Subordinate Piece of Equipment

Create a piece of equipment with the number EQUI2## and equipment category S. Enter your equipment EQUI1## as a copy model.

Copy all the sub-objects proposed.

Change the description to **Printer Control Unit**.

Create an equipment hierarchy by assigning this piece of equipment to the superior equipment EQUI1##.

What system status does the equipment have following this installation?

Save the equipment master record.

3. Install customer equipment

Change your equipment EQUI1## and install it at the functional location HTEC##-SHIP.



Hint: If you have not already created the functional location HTEC##-SHIP , you may alternatively create the functional location 1171-ADMI-0001 Use *Hitech Management* (or other areas in this structure).

4. Displaying the Technical Object Structure

Call up the structural display for the functional location HTEC##.

Display four levels below. Display the functional location hierarchy, installed pieces of equipment and equipment hierarchy.

Solution 4: Usage Options (Equipment)

Task 1:

A new equipment category for pumps is required.

First check the equipment categories available in Customizing and use a free number from 1 – 9 or letter from A - Z.

Create a new equipment category with the name Pump group##.

1. How do you proceed?

Which equipment category have you created?

a) *SAP menu → Tools → Customizing → IMG → Execute Project*

Button SAP Reference IMG

Plant Maintenance and Customer Service → Master Data in Plant Maintenance and Customer Service → Technical Objects → Equipment → Equipment Categories → Maintain Equipment Category

Button New Entries

| Field Name or Data Type | Values |
|--|----------------|
| Category | For example, A |
| RefCat | Machines |
| Equipment category description | Pump group ## |
| A (No alphanumeric equipment numbers) | Not active |
| C (Change documents should be written) | Not active |
| WFE (workflow event) | Not active |
| Object info | No entry |
| View profile | No entry |

2. Make the required entries so that change documents are created for the new equipment category and you can obtain object information using the PM key.

Continued on next page

How do you proceed?

- a) *SAP menu → Tools → Customizing → IMG → Execute Project*

Button *SAP Reference IMG*

Plant Maintenance and Customer Service → Master Data in Plant Maintenance and Customer Service → Technical Objects → Equipment → Equipment Categories → Maintain Equipment Category

| Field Name or Data Type | Values |
|--|----------------|
| Category | For example, A |
| RefCat | Machines |
| Equipment category description | Pump group ## |
| A (No alphanumeric equipment numbers) | Not active |
| C (Change documents should be written) | ✓ |
| WFE (workflow event) | Not active |
| Object info | PM |
| View profile | No entry |

3. Assign the new equipment category to the number range that already exists in the system.

How do you proceed?

Continued on next page

What options do you have for number assignment?

- a) *SAP menu → Tools → Customizing → IMG → Execute Project*

Button *SAP Reference IMG*

Plant Maintenance and Customer Service → Master Data in Plant Maintenance and Customer Service → Technical Objects → Equipment → Equipment Categories → Define Number Ranges

Button *Maintain groups*

Options for number assignment:

Select available group again, button *Maintain* (pencil) → two intervals are displayed on *Maintain Number Range Intervals* screen, the second of which has the indicator for external numbering, that is, both **internal** and **external** number assignments are available for your equipment category

4. Use the relevant Customizing option to create a view profile **Gr##** that contains the following views:

| Tabstrip | Contents |
|-------------------|---|
| General | General and manufacturer data, reference data, address |
| Organization | Location data, account assignment data, areas of responsibility |
| Structure | Structuring, classification (standard class - part of screen) |
| Additional data 1 | Partners, guarantees, documents (part of screen) |

The *Additional data 1* tab page should be given an appropriate name or a graphic symbol.

How do you proceed?

- a) *SAP menu → Tools → Customizing → IMG → Execute Project*

Button *SAP Reference IMG*

Plant Maintenance and Customer Service → Master Data in Plant Maintenance and Customer Service → Technical Objects → General Data → Set View Profiles for Technical Objects

Button *New Entries*:

Continued on next page

| Field Name or Data Type | Values |
|-------------------------|--|
| Screen grp | Screen group – equipment data |
| Profile | Gr## |
| Des. Profile | For example, view profile for group ## |

ENTER and select line, then in column *Dialog Structure* double click on line *Activity and layout of views*, then button *New entries*

View General

| Field Name or Data Type | Values |
|-------------------------|---------|
| Number | 10 |
| Descriptn | General |
| Tab active | ✓ |
| Seq. no. | 005 |
| Seq. no. | 010 |
| Seq. no. | 015 |
| Seq. no. | 025 |

View Organization

| Field Name or Data Type | Values |
|-------------------------|--------------|
| Number | 30 |
| Descriptn | Organization |
| Tab active | ✓ |
| Seq. no. | 020 |
| Seq. no. | 030 |
| Seq. no. | 035 |
| Seq. no. | No entry |

View Structure

Continued on next page

| Field Name or Data Type | Values |
|-------------------------|-----------|
| Number | 50 |
| Descriptn | Structure |
| Tab active | ✓ |
| Seq. no. | 040 |
| Seq. no. | 097 |
| Seq. no. | No entry |
| Seq. no. | No entry |

View Additional data 1

| Field Name or Data Type | Values |
|-------------------------|-------------------|
| Number | 60 |
| Descriptn | Additional data 1 |
| Tab active | ✓ |
| Seq. no. | 100 |
| Seq. no. | 110 |
| Seq. no. | 122 |
| Seq. no. | No entry |

5. Assign the view profile (created above) to your equipment category.

Continued on next page

How do you proceed?

- a) *SAP menu → Tools → Customizing → IMG → Execute Project*

Button *SAP Reference IMG*

Plant Maintenance and Customer Service → Master Data in Plant Maintenance and Customer Service → Technical Objects → Equipment → Equipment Categories → Maintain Equipment Category

| Field Name or Data Type | Values |
|--|----------------|
| Category | For example, A |
| RefCat | Machines |
| Equipment category description | Pump group ## |
| A (No alphanumeric equipment numbers) | Not active |
| C (Change documents should be written) | ✓ |
| WFE (workflow event) | Not active |
| Object info | PM |
| View profile | Gr## |

6. Which business views can you activate in addition to the view profile?

- a) *SAP menu → Tools → Customizing → IMG → Execute Project*

Button *SAP Reference IMG*

Plant Maintenance and Customer Service → Master Data in Plant Maintenance and Customer Service → Technical Objects → Equipment → Define Additional Business Views for Equipment Categories

Other views:

PRT indicator, SD data, configuration, serial data

7. Allow this equipment category to be installed at the functional location. In addition, define that the usage history be updated when changes are made to the master record.

Continued on next page

How do you do this?

- a) SAP menu → Tools → Customizing → IMG → Execute Project

Button SAP Reference IMG

Plant Maintenance and Customer → Service → Master Data in Plant Maintenance and Customer Service → Technical Objects → Equipment → Equipment Usage Period → Define Installation at Functional Location

| Field Name or Data Type | Values |
|--------------------------------|----------------|
| Category | For example, A |
| Equipment category description | Pump group ## |
| RefCat | M (machines) |
| Inst. at FunctLoc. | ✓ |

Plant Maintenance and Customer Service → Master Data in Plant Maintenance and Customer Service → Technical Objects → Equipment → Equipment Usage Period → Usage History Update

| Field Name or Data Type | Values |
|--------------------------------|----------------|
| Category | For example, A |
| RefCt | Machines |
| Time seg. | X |
| Equipment category description | Pump group ## |

8. Create a new equipment master record TET-## using the newly created equipment category.

Enter the following data:

| Field Name or Data Type | Values |
|-------------------------|--------------------------|
| Maintenance plant | 1000 |
| Object type | 1000 (water supply pump) |
| Manufacturer | Merged pump plants |
| Manufacturer serial no. | 12345-6 |

Continued on next page

| | |
|----------------------|---------|
| Category description | XY-0815 |
| Year of construction | 2004 |
| Cost center | 4300 |

Where do you make these entries?

- a) *SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Equipment → Create (General)*

Enter number **TEW- ##**, select category and ENTER

General tab page, *Object type* field and enter **1000**

Location tab page, *Maintenance plant* field and enter **1000**

Organization tab page, *Cost center* field, enter **4300** and save

9. Install your new equipment **TET- ##** at pump station **##-B01-1**.

What requirements must be met for a piece of equipment to be installed?

What system status does the equipment have before being installed?

First install the equipment with data transfer from the functional location and copy all the functional location data. How do you proceed?

What system status does the equipment have after being installed?

To which cost center does the equipment belong after it has been installed?

Continued on next page

Display the structure of pump station ##-b01 with the installed equipment. How do you proceed?

a) Prerequisites for equipment installation:

1. Equipment installation must be allowed in the master record for the functional location
2. Equipment category must allow an installation

System status before installation: AVLB

Installation:

SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Equipment → Change

Menubar: Structure → Change Installation Location

Enter functional location ##-B01-1, button *Inst. w. Data Transfer*.

→ A dialog box appears which shows the fields that are copied from the functional location or equipment. Button *InstallLoc (whole)* → → all data is copied from the functional location – use F3 (green arrow) to go back.

System status after installation: INST

Cost center after installation: 4110 (the functional location) – the cost center 4300 that was maintained in the equipment to begin with is replaced as a result of the installation.

Display structure of pumping station:

SAP Menu → Logistics → Plant Maintenance → Management of Technical Objects → Functional Location → Structural Display

Enter functional location ##-B01-1 and activate checkbox *Installed equipment* under *Explosion*, execute

Task 2:

Optional

1. You are searching for a vehicle with the following criteria:

| | |
|----------------------|-------------------------|
| Loading space height | Up to 2000 mm |
| Loading volume | Up to 12 m ³ |

Continued on next page

How do you proceed?

- a) *SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Equipment → List Editing → Display Vehicles*

Enter the pre-specified selection criteria into the fields *Load volume*, *Volume unit*, *Load height*, and *Dimension unit: Load*. Choose *Execute*.

2. Determine the Customizing settings relevant for fleet object management.

Where is the view profile assigned?

What is the connection between fleet object type and equipment category?

- a) *SAP menu → Tools → Customizing → IMG → Execute Project*

Button *SAP Reference IMG*

Plant Maintenance and Customer Service → Master Data in Plant Maintenance and Customer Service → Technical Objects → Settings for Fleet Management → Assign View Profile and Equipment Categories to Fleet Object Types

Connection of fleet object type / equipment category

Select line for fleet object type **5000** and double click in *Dialog Structure* column on line *Reference to technical object type*

Table with possible equipment categories for fleet object type

3. Create a new fleet object of fleet object type 5000 (car). Assign the maintenance plant 1000 and maintain the individual views.

How do you proceed?

- a) *SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Equipment → Create (Special) → Fleet Object*

Enter equipment number, for example, CAR-1 or have the number assigned internally (dependent on equipment category chosen below)

Choose fleet object type **5000** and equipment category M

The master record contains the views for the selected equipment category and two tab pages for fleet management

Task 3:

Optional exercises for Customer Service

1. Creating Customer Equipment

Continued on next page

Create a piece of equipment with the number **EQUI1##** and equipment category **S**.

Enter the following data:

| Description | Printer |
|----------------------|-------------------------|
| Planning plant | 1200 |
| Sold-to party | Customer number T-CSD## |
| Sales organization | 1000 |
| Distribution channel | 14 |
| Division | 00 |

Continued on next page

Save the equipment master record.

- a) *Logistics → Customer Service → Management of Technical Objects
→ Equipment → Create*

| Field Name or Data Type | Values |
|-------------------------|---------|
| Equipment | EQUI1## |
| Equipment category | S |

Enter

| Field Name or Data Type | Values |
|-------------------------|---------|
| Description | Printer |

Organization

| Field Name or Data Type | Values |
|-------------------------|--------|
| Planning plant | 1200 |

Partner

| Field Name or Data Type | Values |
|-------------------------|------------------|
| Sold-to party | Customer T-CSD## |

Sales and distribution

| Field Name or Data Type | Values |
|-------------------------|--------|
| Sales organization | 1000 |
| Distribution channel | 14 |
| Division | 00 |

Save

2. Creating a Subordinate Piece of Equipment

Create a piece of equipment with the number EQUI2## and equipment category S. Enter your equipment EQUI1## as a copy model.

Copy all the sub-objects proposed.

Continued on next page

Change the description to **Printer Control Unit**.

Create an equipment hierarchy by assigning this piece of equipment to the superior equipment **EQUI1##**.

What system status does the equipment have following this installation?

Save the equipment master record.

- a) *Logistics → Customer Service → Management of Technical Objects → Equipment → Create*

| Field Name or Data Type | Values |
|-------------------------|---------|
| Equipment | EQUI2## |
| Equipment category | S |
| Reference equipment | EQUI1## |

Enter

Confirm the following dialog box using *Continue*.

| Field Name or Data Type | Values |
|-------------------------|----------------------|
| Description | Printer control unit |

Choose *Structure → Change installation location*.

| Field Name or Data Type | Values |
|-------------------------|---------|
| Superior equipment | EQUI1## |

Confirm

The equipment receives the system status *ASEQ* (assigned to superior equipment) following the installation.

Save

3. Install customer equipment

Continued on next page

Change your equipment EQUI1## and install it at the functional location HTEC##-SHIP.



Hint: If you have not already created the functional location HTEC##-SHIP , you may alternatively create the functional location 1171-ADMI-0001 Use *Hitech Management* (or other areas in this structure).

- a) *Logistics → Customer Service → Management of Technical Objects → Equipment → Change*

| Field Name or Data Type | Values |
|-------------------------|---------|
| Equipment | EQUI1## |

Enter

Choose the menu path *Structuring → Change installation location*.

| Field Name or Data Type | Values |
|-------------------------|-------------|
| Functional location | HTEC##-SHIP |



Hint: If you have not already created the functional location HTEC##-SHIP , you may alternatively create the functional location 1171-ADMI-0001 Use *Hitech Management* (or other areas in this structure).

Confirm

Save

4. Displaying the Technical Object Structure

Call up the structural display for the functional location HTEC##.

Continued on next page

Display four levels below. Display the functional location hierarchy, installed pieces of equipment and equipment hierarchy.

- a) *Logistics → Customer Service → Management of Technical Objects → Functional Location → Structural Display*

| Field Name or Data Type | Values |
|-------------------------|--------|
| Functional Location | HTEC## |
| Number of levels below | 4 |

Select *Location hierarchy*, *Equipment installed* and *Equipment hierarchy* and then choose *Execute*.



Lesson Summary

You should now be able to:

- Identify the usage options for equipment
- Create and maintain equipment master records
- Understand changes to the equipment master record

Lesson: Classification

Lesson Overview

This lesson shows how you can use classification to assign additional features to a piece of equipment and assign values to them.



Lesson Objectives

After completing this lesson, you will be able to:

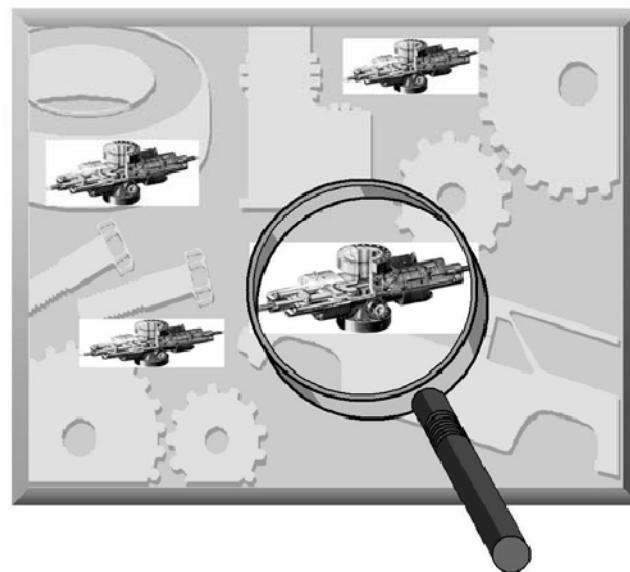
- Classify pieces of equipment
- Search for pieces of equipment using the classification

Business Example

The individual objects to be represented have a number of very specific features.

You want to represent them using classification.

Classification System



Class:

- Pumps

Characteristics:

- Lifting height in meters
- Power requirement in Watts
- Connection type

Figure 36: Classifying Technical Objects

Classification is a cross-application function in the SAP System that is used by other applications as well as Plant Maintenance.

One aim of classification is to assign features in detail to a technical object that cannot be assigned to the master record by using the fields of the SAP standard system.

Classification also provides a very different search option whereby objects can be sought and found according to characteristics and their features. Example: Power requirement = 2,000 Watts AND lifting height = 10 meters AND ...

In order processing, the classification enables you to search for a spare part (for example, a pump with the same features). The system uses the classification data as the basis for the search. In the results list, you can select a component and copy it into the order.

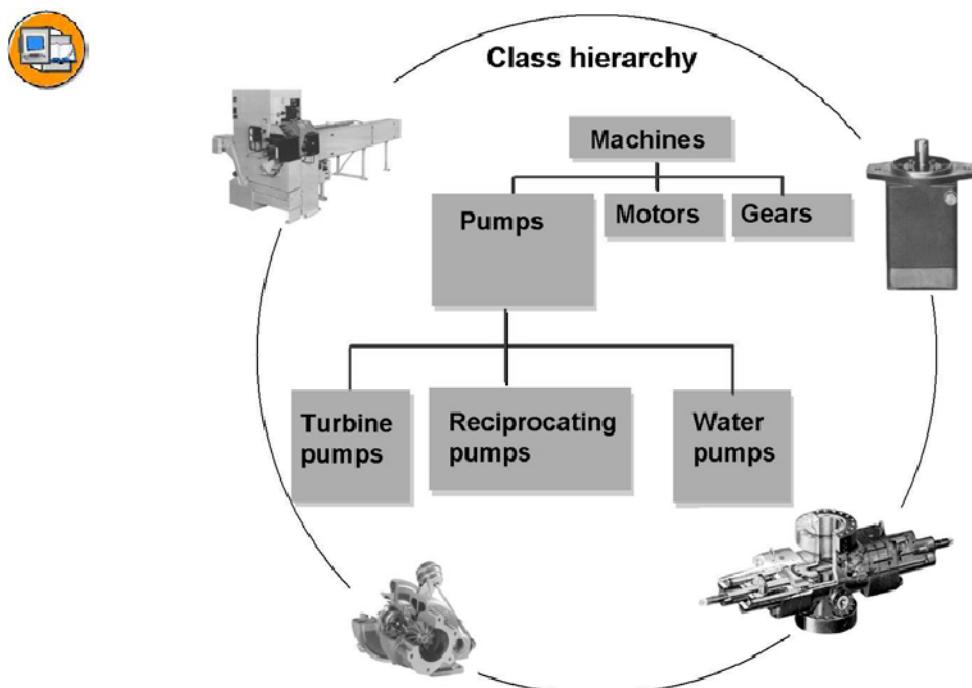


Figure 37: Classification System

A classification system has the task of describing objects using characteristics, and grouping similar objects into classes, to classify them and make them easier to find.

The structure of a classification system consists of three steps:

1. Defining the features

First you describe the features of an object using characteristics. You create the characteristics centrally in the SAP system.

2. Creating the classes

In the second step, the classes are created in the SAP System. When classes are created (or later on, in a separate step), the characteristics are assigned to the classes.

3. Assigning the objects (=classification)

When you have created the classes required for classification, you can assign objects to these classes. The objects are described using the characteristics contained in the class.

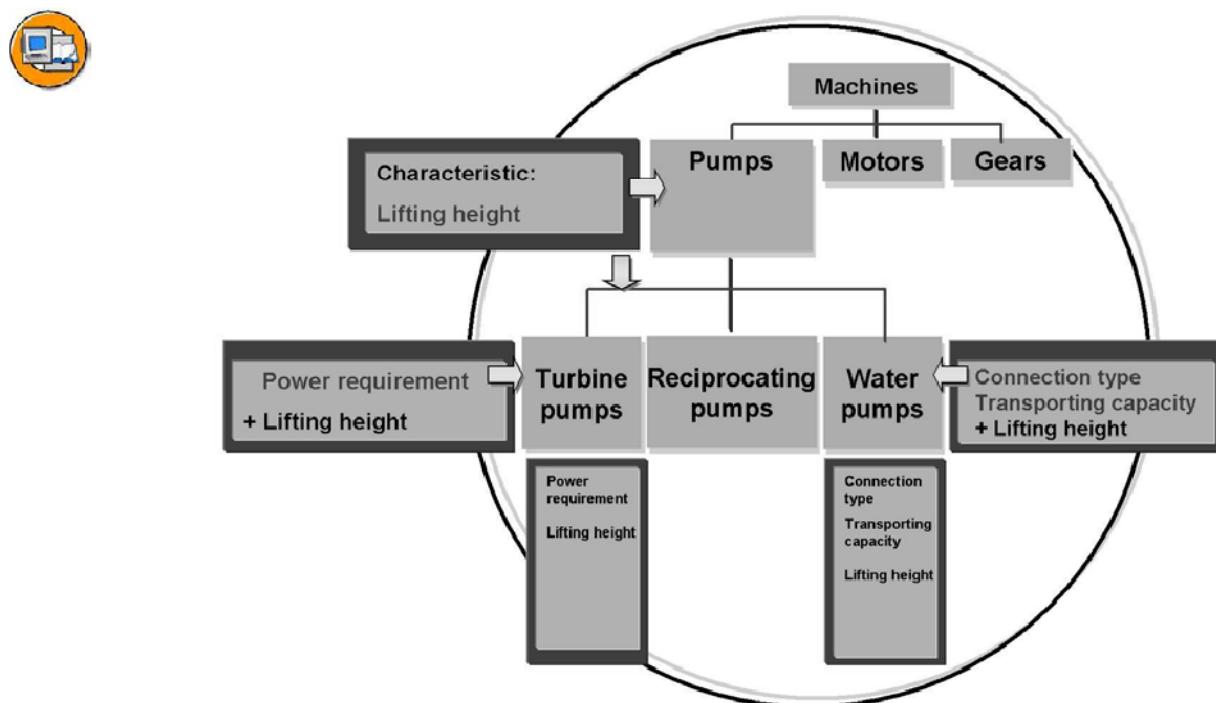


Figure 38: Characteristic Inheritance

Characteristic inheritance is the transfer of a characteristic and all its values into all the subordinate classes of a class hierarchy. The characteristic is therefore not contained in the subordinate classes. Characteristic inheritance enables you to define a central characteristic, which is required in all the subordinate classes, once to a superior class and not have to assign it explicitly to each class.

If you create a class hierarchy, the characteristics for all the superior classes are inherited by the lower classes. Therefore, characteristics that you have not assigned explicitly to the class, but which originate from superior classes, are also displayed on the valuation screen.

Classifying Pieces of Equipment

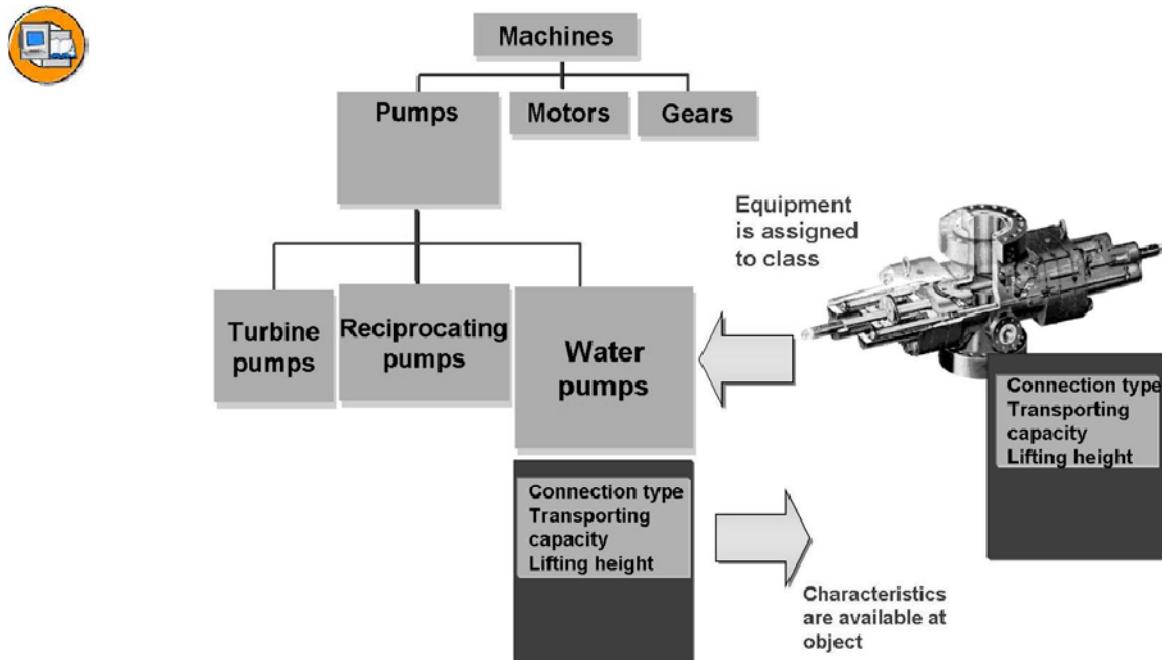


Figure 39: Classifying a Technical Object

A technical object (functional location, equipment) can be assigned to one or more classes using its master record.

If you assign the technical object to more than one class, you can define a standard class.

If the technical object has been assigned to a class, all the characteristics for this class are available at the object, that is, the characteristics can be valued for each object.

A characteristic can be valued manually or automatically. Depending on how the characteristic is controlled, values can either be selected from a list specified in the characteristic or entered freely. In the case of automatic valuation, the characteristic refers to a table field or another characteristic.

Exercise 5: Classification

Exercise Objectives

After completing this exercise, you will be able to:

- Display an equipment class with characteristics
- Classify pieces of equipment

Business Example

The individual objects to be represented have a number of very specific features.

You want to represent them using classification.

Task:

Classify your new equipment master record TET-##.

1. Classifying equipment

Assign your equipment TET-## to class **ED112** and give values to the characteristics ready for input.

Estimate the running wheel diameter at 910 mm.

Which characteristics are ready for input and why?

How are values assigned to the characteristics not ready for input?

2. Displaying the class hierarchy *Optional*

Display the class hierarchy to which class ED112 belongs.

How do you proceed?

Which is the uppermost class?

Which characteristics are inherited by which class?

Which setting can you use to make inherited characteristics visible?

Solution 5: Classification

Task:

Classify your new equipment master record TET-##.

1. Classifying equipment

Assign your equipment TET-## to class ED112 and give values to the characteristics ready for input.

Estimate the running wheel diameter at 910 mm.

Which characteristics are ready for input and why?

How are values assigned to the characteristics not ready for input?

- a) *SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Equipment → Change*

Button *Class overview*, enter class ED112, ENTER, go back using arrow button;

Tab page *Structure* >the view *Classification* is now displayed;

The characteristics *category description*, *manufacturer serial number*, *year of construction* and *manufacturer* refer to table fields of the equipment master record and are therefore assigned values automatically.

The characteristics *rotor diameter*, *output* and *weight* are ready for input because they do not refer to table fields and are therefore not assigned values automatically.

2. Displaying the class hierarchy *Optional*

Display the class hierarchy to which class ED112 belongs.

How do you proceed?

Which is the uppermost class?

Which characteristics are inherited by which class?

Continued on next page

Which setting can you use to make inherited characteristics visible?

- a) *SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Equipment → Change or Display*

Button Class overview, select row with class ED112

Environment → Class Hierarchy → Superior/Subordinate → List

Uppermost class: ED1

Characteristic inheritance:

Environment → Display master data (go to the class master record)

Characteristics tab page

| Field Name or Data Type | Values |
|---------------------------|--------------------------------------|
| Characteristic | C211 (weight) C203 (manufacturer) |
| ... | |
| Inherited characteristic: | ◦ |

Position cursor on characteristic C203 or C211 and

Extras → Characteristic inheritance

Characteristic C203 or C211 inherited from class ED1

Displaying inherited characteristics:

If the inherited characteristics should not be displayed, these can be switched off as follows:

Class overview button in equipment master record;

Menn bar: Extras → User settings

In the *Scope* area, activate the checkbox *With inherited characteristics*



Lesson Summary

You should now be able to:

- Classify pieces of equipment
- Search for pieces of equipment using the classification

Lesson: Customizing Equipment

Lesson Overview

This lesson shows the necessary Customizing settings for pieces of equipment.



Lesson Objectives

After completing this lesson, you will be able to:

- Make the necessary Customizing settings for pieces of equipment

Business Example

The project team has to represent different categories of individual objects, such as pumps and engines. These categories must be defined and configured in Customizing.

Customizing Equipment



- **Equipment categories**
 - Category
 - Number range
 - Business views
- **Profile**
- **Usage history**
- **Object types**
- **Installation at functional location**
- **Field selection for equipment master record**
- **Integration with Asset Accounting**

Figure 40: Settings for Equipment

The equipment category enables you to make a rough division of the equipment used in the company. A number range is configured for each equipment category.

Each equipment category obtains the necessary business views (using a view profile and additional switchable tab pages).

You also define for each equipment category whether the history should be updated when the master record is changed. For each field in the master record, it can be agreed here when an update is performed.

The object type enables a more exact division of the equipment categories (for example, equipment category for machines or object type for motors).

It must be agreed for each equipment category whether an installation at the functional location is allowed.

In Customizing for Asset Accounting, you decide if integration between Asset Accounting and Plant Maintenance is required and how to synchronize master records.



Lesson Summary

You should now be able to:

- Make the necessary Customizing settings for pieces of equipment

Lesson: BAPIs and Customer Exits: Equipment

Lesson Overview

This lesson shows the BAPIs and customer exits in the equipment area.



Lesson Objectives

After completing this lesson, you will be able to:

- List the options for customer enhancements

Business Example

The project team wants to carry out user-defined checks for certain equipment categories before posting the equipment master record. A customer exit can be used for this purpose.



Examples:

- **BAPI_EQMT_CREATE**
Create a piece of equipment
- **BAPI_EQMT_DETAIL**
Read details for equipment
- **BAPI_EQMT_DISMANTLEFL**
Dismantle equipment at functional location
- **BAPI_EQMT_DISMANTLEHR**
Dismantle equipment from equipment hierarchy
- **BAPI_EQMT_GETCATALOGPROFIL**
Determine catalog profile for equipment



Figure 41: Business Application Programming Interfaces (BAPIs)

Definition of BAPI:

BAPIs are standardized, stable interfaces (methods) that enable you to access SAP business objects and thereby represent an important option for integrating the SAP System with external systems.

Example: An instance (a concrete object) of the SAP business object **Equipment** should be created in an SAP system from an external program. To do this, the external program would call up the BAPI "BAPI_EQMT_CREATE" and create a concrete piece of equipment.

You can display all the BAPIs available in the SAP R/3 System with all relevant details using the BAPI Explorer (transaction BAPI).



- **IEQM0001**
 - Additional checks when installing equipment at a functional location
- **IEQM0002**
 - Additional checks when working with equipment hierarchies
- **IEQM0007**
 - Checks/changes to manufacturer field in equipment master record

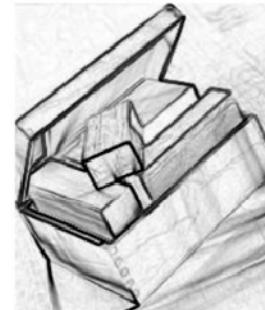


Figure 42: Customer Exits (1)

Definition of Customer Exit:

Customer exits provide the option of adding user-defined functions to the standard SAP applications as part of the R/3 enhancement concept. Customer exits themselves do not have any functions, but are program exits that enable you to include user-defined programs.

There are two main advantages to customer exits:

They have no effect on the SAP standard source text.

They are not affected by software updates.

Example: When you save an equipment master record, the *Manufacturer* field should be checked and if necessary re-read from an external table independently of the equipment category and description. Customer exit IEQM0007 is used for this in conjunction with a user-defined program, which performs the check and comparison with the external table.



- ITOB0002
 - Pre-assignment/change of field contents
- ITOB0003
 - Individual fields for fleet objects
- ITOB0004
 - Internal checks for fleet objects
 - Customer exit IHCL0001 for transfer of characteristic valuations



Figure 43: Customer Exits (2)

When technical objects are recreated with reference to a source object, customer exit ITOB0002 enables you to:

Preassign field contents, or

Change fields from the object that is used as a copy model

You can use customer exit ITOB0003 to enter additional data for fleet objects in user-defined fields.

You can use customer exit ITOB0004 to make internal checks for fleet object-relevant identification fields.



Lesson Summary

You should now be able to:

- List the options for customer enhancements



Unit Summary

You should now be able to:

- Identify the usage options for equipment
- Create and maintain equipment master records
- Understand changes to the equipment master record
- Classify pieces of equipment
- Search for pieces of equipment using the classification
- Make the necessary Customizing settings for pieces of equipment
- List the options for customer enhancements

Unit 3

Bills of Material

Unit Overview

This chapter follows on from the chapter *Technical Objects* in the course PLM300, recapitulates the term and concept of the maintenance bill of material and then expands on the application of bills of material with a whole range of detailed functions and their related Customizing settings.



Unit Objectives

After completing this unit, you will be able to:

- Describe the BOM structure
- List different BOM categories
- Describe the concept of a configurable bill of material
- Enter Customizing settings for bills of material

Unit Contents

| | |
|---|-----|
| Lesson: Usage of Maintenance Bills of Material..... | 100 |
| Exercise 6: Usage of Bills of Material..... | 111 |
| Lesson: Configuration..... | 119 |
| Lesson: Customizing for Bills of Material..... | 123 |
| Exercise 7: Customizing for Maintenance Bills of Material | 125 |

Lesson: Usage of Maintenance Bills of Material

Lesson Overview

This lesson shows the usage of maintenance bills of material as distinct from bills of material in other company areas.



Lesson Objectives

After completing this lesson, you will be able to:

- Describe the BOM structure
- List different BOM categories

Business Example

Replacement spare parts should be made available for the planning of both larger systems and individual machines.

Revision

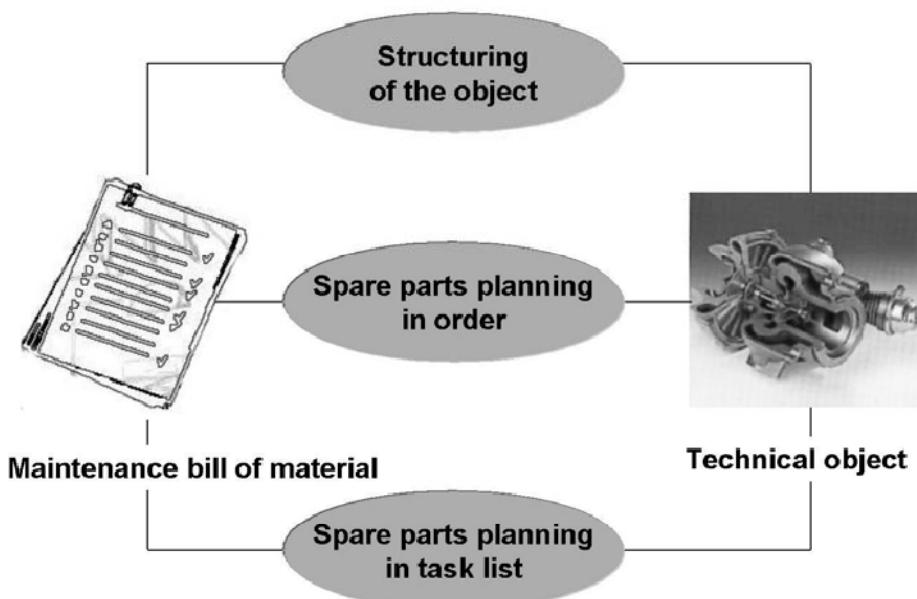


Figure 44: Purpose of the Maintenance Bill of Material

You can use bills of material for different reasons in a company. A distinction is made between different uses, depending on the company area, for example:

The **engineering/design BOM** includes all parts of the product (from an engineering/design perspective) and contains their technical data. It is not usually order-specific.

The **production BOM** includes items based on production perspectives and assembly statuses. For example, the assembly might only require production-relevant items with process-oriented data.

The **costing BOM** represents the product structure and forms the basis for the automatic determination of material usage costs for a product. Items not relevant for costing are not included in this bill of material.

The maintenance bill of material (maintenance BOM) is different from the others because it only contains items relevant to maintenance.

The maintenance bill of material has two main functions:

Structuring the object

An object should be structured as clearly as possible from a maintenance viewpoint.

Spare part planning in the order

If a bill of material is available for a maintenance object, this can be easily used to plan spare parts when planning a maintenance order.

Structure and Usage

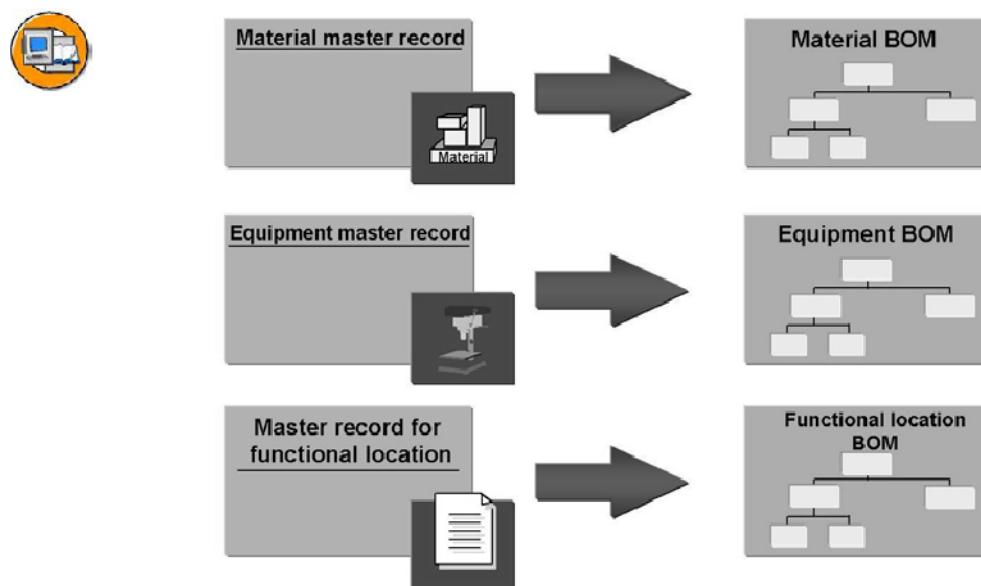


Figure 45: Bill of Material Categories

The material BOM is created with a direct link to a material master record. The material master record includes descriptive data (for example, measurements and weight) and control data (for example, material category and industry). The material BOM contains the individual parts of the object (materials or assemblies).

The equipment or functional location BOM is used to describe the structure of a piece of equipment or functional location and assign spare parts to it for maintenance.

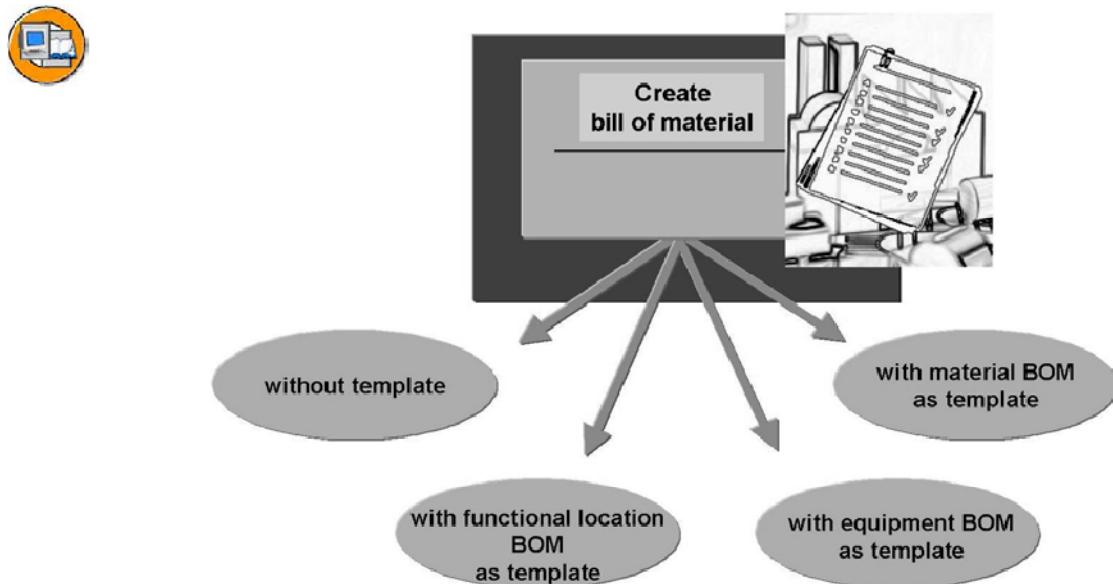


Figure 46: Creating a Bill of Material

You can create all categories of bill of material with or without using a template. If you use a template, the following rules apply for each category:

To create a BOM for a functional location or an equipment BOM, you can use material BOMs, equipment BOMs, and functional location BOMs as a template.

To create a material BOM, you can only use material BOMs as a template.

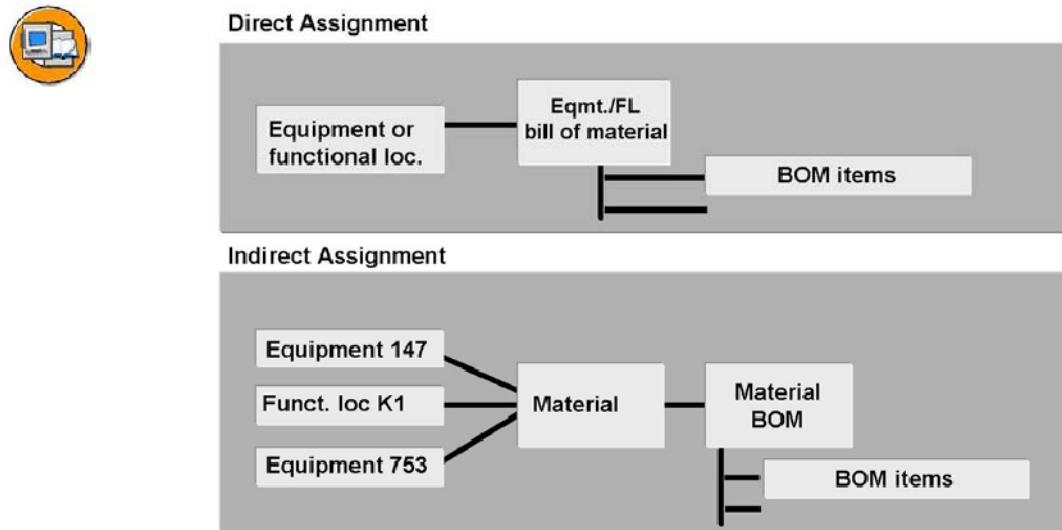


Figure 47: Bill of Material Assignment

You can link a bill of material to a technical object in two ways: By direct or indirect assignment.

For direct assignment, a bill of material is created directly for the object (functional location or equipment).

For indirect assignment, you can assign a bill of material to master records for technical objects using a material master record. You make the assignment in the master record for the technical object by entering the material number in the *Construction type* field. The bill of material is dependent on the material and not directly on the technical object. This is advisable if several objects exist for the same construction type: You do not have to create an equipment BOM for each individual object - all objects of the same construction type use the same material BOM.

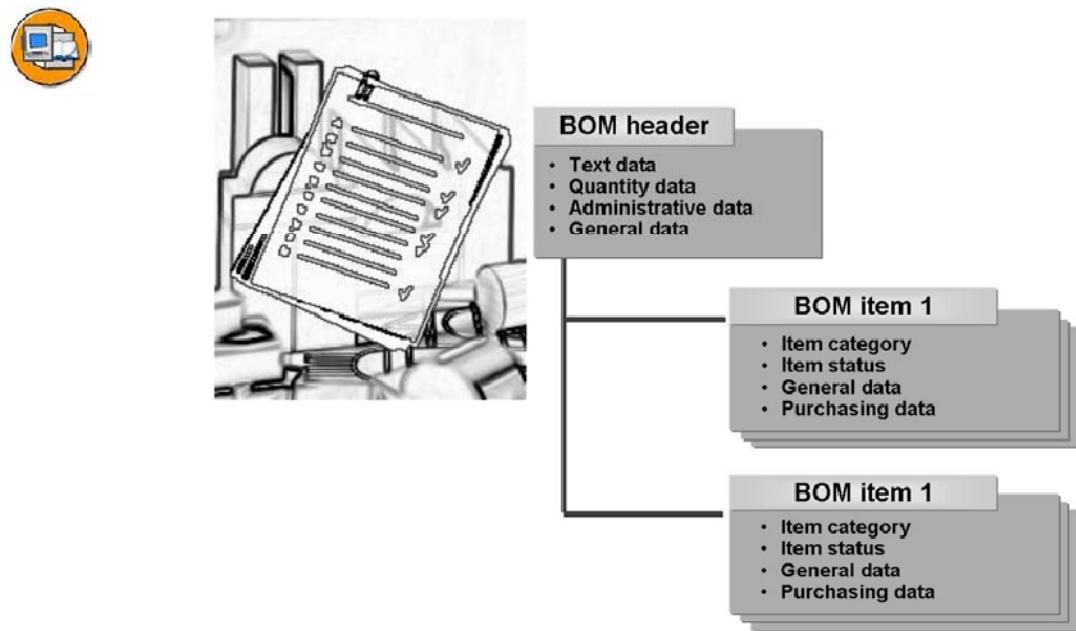


Figure 48: Bill of Material Structure

The data that you maintain in the bill of material header is valid for the entire bill of material with its components (BOM items or sub-items).

The components of a technical object are located in the BOM items. Item data is only valid for a particular item within the bill of material.

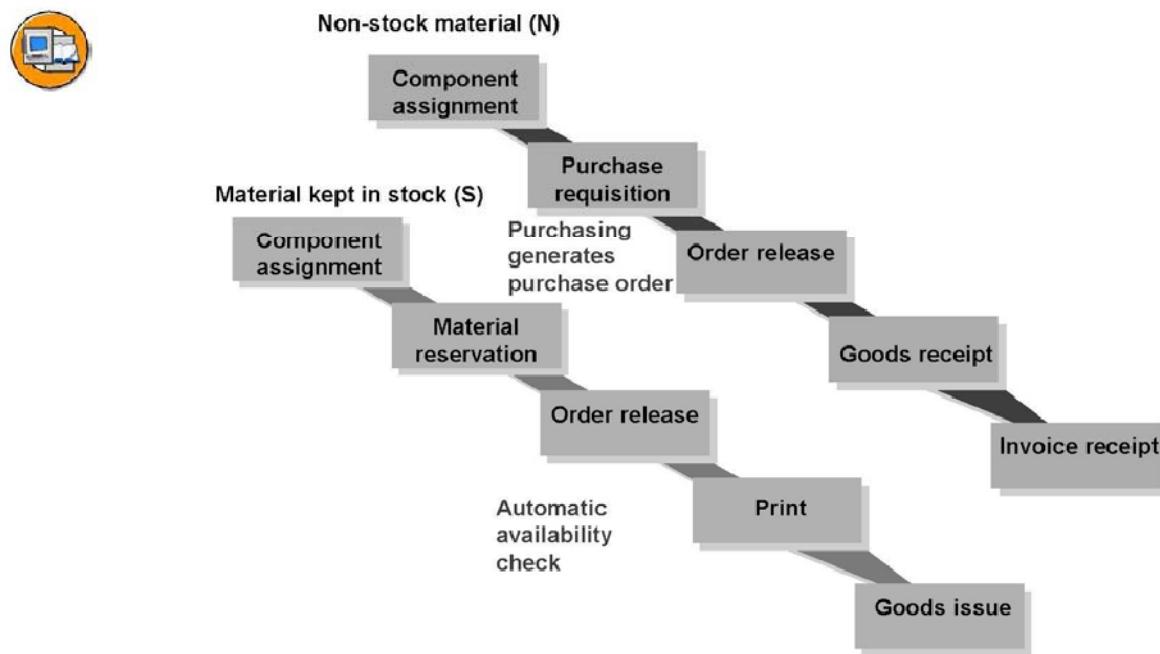


Figure 49: Bill of Material Items in Order

You can schedule bill of material components from the reference object (materials), which are required to execute the task, for each operation in the maintenance order.

The materials that you schedule for the maintenance order are reserved in the warehouse, provided that they are kept in stock. The automatic creation of the reservation is controlled using item category **S (stock material)**.

The process flow is different if you schedule non-stock materials. In this case, ordering is initiated using item category **N (non-stock material)** that results in the automatic creation of a purchase requisition.

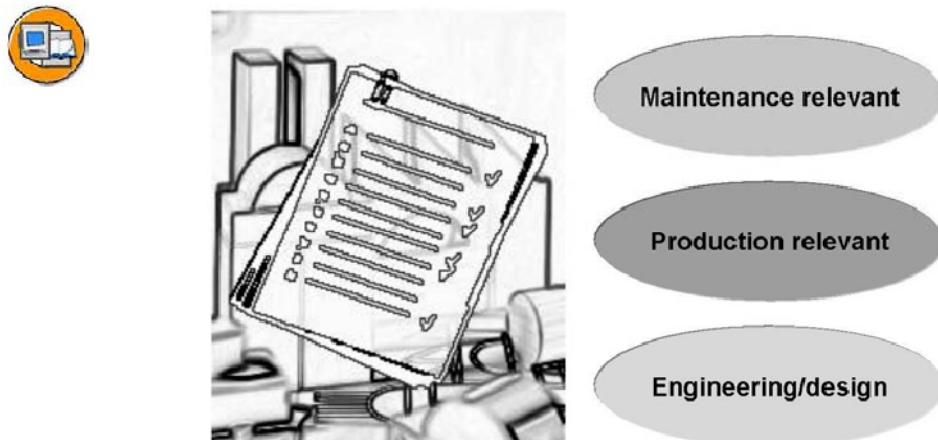


Figure 50: Item Status

In each company, the **BOM usage** (in the Customizing for Production) defines the allowed entries for the **item status**. Various BOM item indicators are combined under the heading "item status", and they include relevant for engineering/design, relevant for production, relevant for costing and so on.

The item status indicators control the process flow in subsequent areas of work and the selection of items in the BOM explosion. They require, enable or exclude processing in these areas. If processing is supported in an enterprise area, you can maintain area-specific data for the items. For example, only items relevant for production are copied to the production order.

In order to maintain structure elements or items relevant for maintenance for a function location BOM or equipment BOM, you must select a BOM usage that does support items relevant for maintenance. BOM maintenance for the different areas (for example, engineering/design, production) is performed separately for each usage. If you create several bills of material with different uses for one material, the system saves the bills of material for each usage with their own internal number.

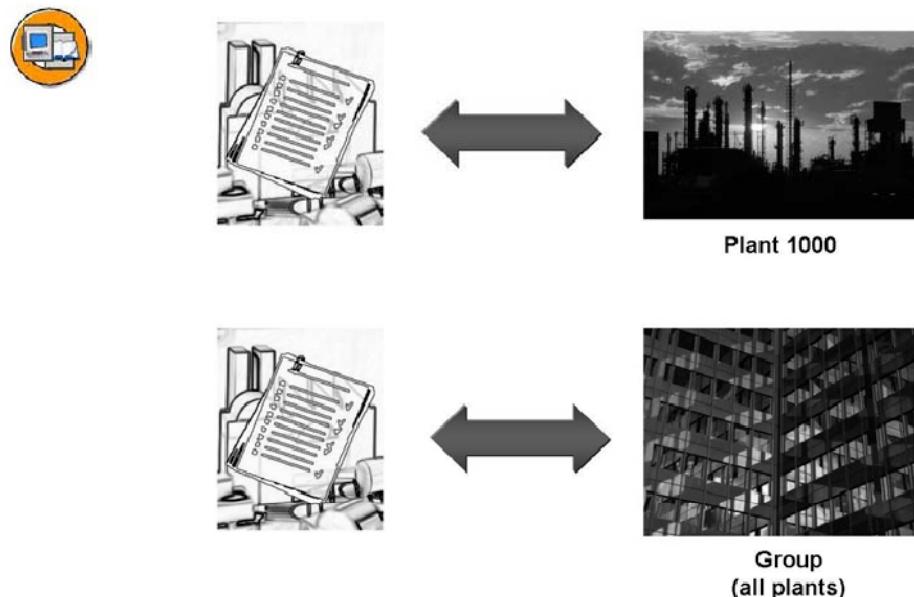


Figure 51: Plant-Specific BOM and Group BOM

A bill of material can manage data that is obligatory for Production. The result is the spatial validity - **the plant**. This consists of the workplaces, at which all the necessary preparatory work is organized, for example, materials planned, and task lists created. In this case, you create a plant-specific bill of material. Numerous checks are made. In the case of a material BOM, for example, a material master record with plant data for the relevant plant must exist for the material in the BOM header. When items are entered, the system checks whether plant data is also available for the material components. If the results of the checks are satisfactory, the system copies the material to the material BOM.

However, you can also create a bill of material **without** reference to a plant; this is a **group BOM**. This may be used, for example, if the engineer maintains a bill of material in the design phase that is subsequently assigned to one or more plants for Production. The system merely checks whether material master records are available. The plant-specific material checks are not performed.

Maintenance Assemblies

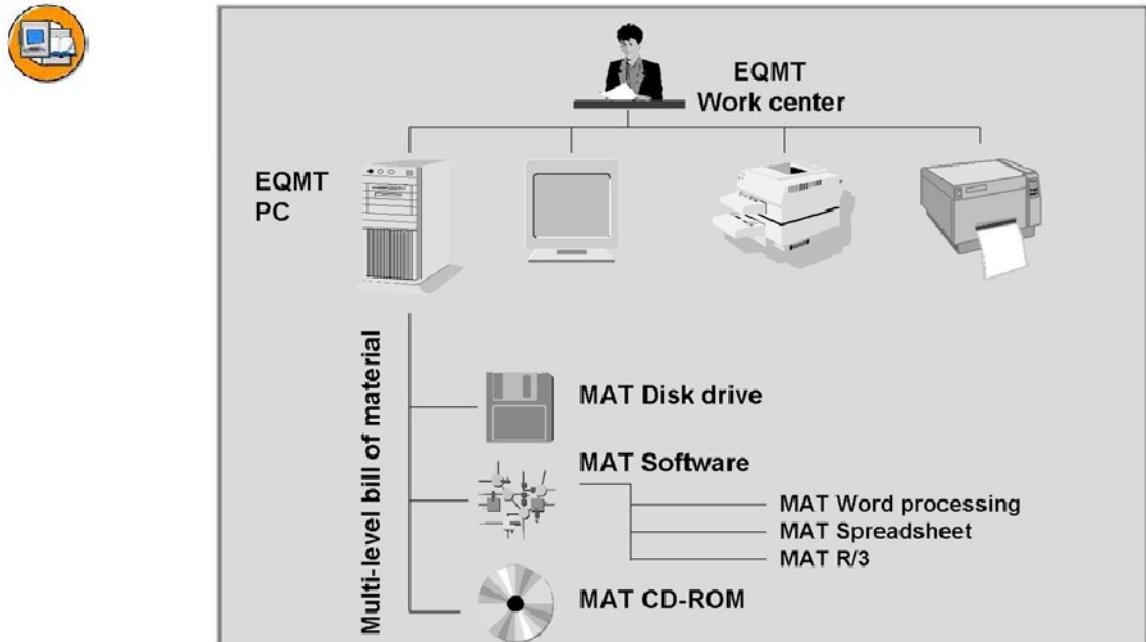


Figure 52: Multi-Level Bill of Material with Assembly

In the spare parts planning, you can represent the structure of a technical object by means of a one-level or multi-level BOM.

One-level BOMs contain the required spare parts in the form of a simple list of material numbers.

Multi-level BOMs can consist of individual materials and assemblies which in turn have their own BOM.

Assemblies thus act as structure nodes within a BOM and combine spare parts relevant for maintenance.

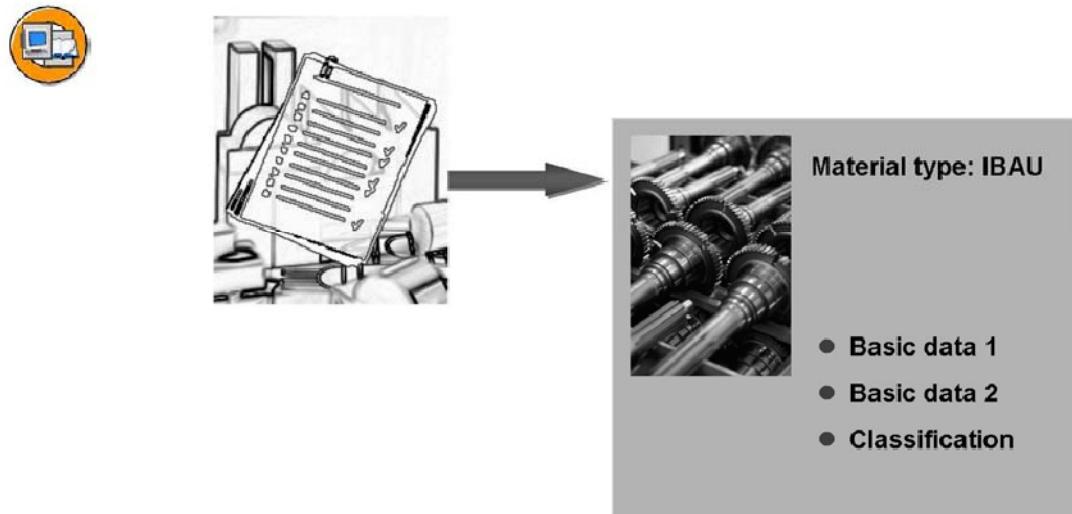


Figure 53: Maintenance Assembly

Maintenance assemblies are materials of material type IBAU. The material master record only contains basic data and classification data, in other words, inventory management is not possible for maintenance assemblies.

You use maintenance assemblies as structure elements in a bill of material if you want to:

Combine similar materials under one node

Track the costs in the Plant Maintenance Information System, but do not require inventory management

However, you also have the option of selecting a material of another material type as a maintenance assembly.

The **Maintenance Assembly indicator** is set on the *Status/Long Text* of BOM items screen and can only be maintained for items relevant for maintenance. During the processing of maintenance tasks, items marked as a maintenance assembly are displayed as structure elements of an operational system. They can be used to describe an item from an operational system in greater detail (for example, possible location of damage).

For bills of material relevant for maintenance, the components are checked when the maintenance assembly is maintained. The field can only be maintained if the BOM component contains a material. When evaluating bills of material, you can select items relevant for maintenance that are marked as maintenance assemblies.

Quantities of BOM items are displayed in the structure list. You can determine whether the required quantities at the lower level should be multiplied out and displayed with the quantity at the superordinate level.

A technical object (superordinate level) is composed of, for example, 5 wheels. A wheel (lower level) is composed of: 4 screws, 1 tire, 1 rim. If the lower level is multiplied out with the superordinate level, this gives the following required quantities: 20 screws, 5 tires, 5 rims.

Exercise 6: Usage of Bills of Material

Exercise Objectives

After completing this exercise, you will be able to:

- Check the usage of bills of material
- Set parameters for the BOM item
- Create and assign bills of material relevant for maintenance

Business Example

The technical systems and buildings at IDES should be structured as extensively as possible, so that an exact picture of the object is available in each situation, thereby enabling exact planning of spare parts in the maintenance order.

Task:

In plant 1000, a material BOM P## should be created for your pump TET## with usage Plant Maintenance that comprises the following components:

- Shaft casing assembly
- Gears
- Pump motor
- Support foot
- Casing

1. Create the shaft assembly WLB## as a new maintenance assembly. Use the **Mechanical engineering** sector.

Which material type do you require for this?

How do you proceed?



Hint: Use the material WL-1000 as a template

2. Create a material BOM for the shaft assembly WLB## with the following data:

Continued on next page

| Field Name or Data Type | Values |
|-------------------------|----------|
| Plant | 1000 |
| BOM Usage | 4 |
| Alternative BOM | No entry |



Hint: Use the material BOM for the material WL-1000 as a template.

3. Create a material P-## for your pump in plant 1000, storage location 0001, material type "Operating supplies" with the views *Basic data 1*, *Basic data 2*, *General plant data / storage 1* and *General plant data / storage 2*.



Hint: Use the material P-1000 as a template.

How do you proceed?

4. For material P-##, create a material BOM P-## with the following content:

| Field Name or Data Type | Values |
|-------------------------|---------|
| Shaft casing assembly | WLB-## |
| Gears | G-1000 |
| Motor | M-1000 |
| Support foot | 100-600 |
| Casing | 100-100 |

How are the individual elements of the BOM added?

Note the item category!

How do you do this?

Make sure that all the components are displayed as a maintenance assembly (yellow) with sub-structure, irrespective of material type.

5. Assign the newly created material BOM P-## to your equipment TET-## and check the structure in the equipment master record. How do you proceed?

Solution 6: Usage of Bills of Material

Task:

In plant 1000, a material BOM P-## should be created for your pump TET-## with usage Plant Maintenance that comprises the following components:

- Shaft casing assembly
- Gears
- Pump motor
- Support foot
- Casing

1. Create the shaft assembly WLB-## as a new maintenance assembly. Use the **Mechanical engineering** sector.

Which material type do you require for this?

How do you proceed?



Hint: Use the material WL-1000 as a template

- a) *SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Material → Create (Special) → Maintenance Assembly*

| Field Name or Data Type | Value |
|-------------------------|---|
| Industry | Mechanical engineering |
| Material type | IBAU (automatically set by transaction) |
| Material template | WL-1000 |
| Views | Basic data 1+2, classification |

ENTER

Button *Select ALL*

Save

2. Create a material BOM for the shaft assembly WLB-## with the following data:

Continued on next page

| Field Name or Data Type | Values |
|-------------------------|----------|
| Plant | 1000 |
| BOM Usage | 4 |
| Alternative BOM | No entry |



Hint: Use the material BOM for the material WL-1000 as a template.

- a) *SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → BOM → Material BOM → Create*

Creating a Bill of Material

| Field Name or Data Type | Values |
|-------------------------|----------|
| Material | WLB-## |
| Plant | 1000 |
| BOM Usage | 4 |
| Alternative BOM | No entry |

Button *Copy template ...* and enter **WL-1000**:

Select the items and press the *Copy* button.

3. Create a material P-## for you pump in plant 1000, storage location 0001, material type "Operating supplies" with the views *Basic data 1*, *Basic data 2*, *General plant data / storage 1* and *General plant data / storage 2*.



Hint: Use the material P-1000 as a template.

Continued on next page

How do you proceed?

- a) *SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Material → Create (Special) → Operating Supplies*

| Field Name or Data Type | Value |
|-------------------------|--|
| Industry | Mechanical engineering |
| Material type | MRO (automatically set by transaction) |
| Material template | P-1000 |
| Views | Basic data 1+2, General plant data / storage 1+2 |

ENTER

Select the views *Basic data 1*, *Basic data 2*, *General plant data / storage 1* and *General plant data / storage 2*

Save

4. For material P-##, create a material BOM P-## with the following content:

| Field Name or Data Type | Values |
|-------------------------|---------|
| Shaft casing assembly | WLB-## |
| Gears | G-1000 |
| Motor | M-1000 |
| Support foot | 100-600 |
| Casing | 100-100 |

How are the individual elements of the BOM added?

Note the item category!

How do you do this?

Make sure that all the components are displayed as a maintenance assembly (yellow) with sub-structure, irrespective of material type.

- a) *SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → BOM → Material BOM → Create*

Pump P-##

Continued on next page

| ICt (item category) | Component | Component description | Quantity |
|---------------------|-----------|-----------------------|----------|
| I | WLB-## | Shaft assembly ## | 1 |
| L | M-1000 | Motor ## | 1 |
| L | G-1000 | Gears ## | 1 |
| L | 100-600 | Support foot | 1 |
| L | 100-100 | Casing | 1 |

- b) Set color code for assembly (yellow):

SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → BOM → Material BOM → Change

Enter P-##

Select items G-1000 and M-1000 and button for item detail (puzzle symbol);

Activate *Maintenance assembly* indicator on *Status/long text* tab page under *Other data*, continue with arrow (next item) and repeat operation for second item.



Hint: The color codes are only visible if the material BOM is assigned to the equipment (see the next exercise) or if the BOM is displayed in the structure display (transaction IH05).

Maintenance assemblies that have the item category “maintenance structure element” (item category I) as BOM item are represented correctly in the structural display as an assembly with the color code yellow.

Maintenance assemblies that have item categories L or N as BOM item are represented as material with the color code red. Through the above procedure, these items can be represented correctly as an assembly with the color code yellow.

Continued on next page

5. Assign the newly created material BOM P-## to your equipment TET-## and check the structure in the equipment master record. How do you proceed?

a) *SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Equipment → Change*

Structure tab page, enter material number P-## in *Construction type* field and *save*;

Go to Change or Display mode again and use symbol for **structure list**.



Lesson Summary

You should now be able to:

- Describe the BOM structure
- List different BOM categories

Lesson: Configuration

Lesson Overview

This lesson provides an overview of the concept of a configurable BOM.



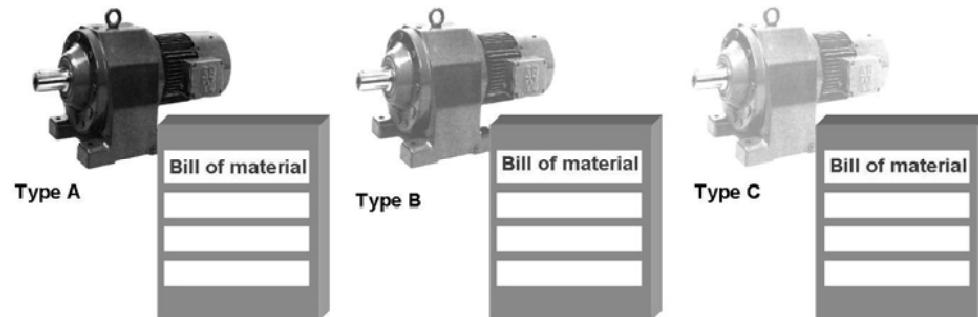
Lesson Objectives

After completing this lesson, you will be able to:

- Describe the concept of a configurable bill of material

Business Example

For multivariant objects, a super BOM is maintained instead of several BOMs, some of which can be redundant.



Separate bills of material for 80% identical construction?

Figure 54: Configuration - Why?

For objects of similar construction, the configuration minimizes the resources required for entering BOMs, thereby simplifying and accelerating the selection of spare parts for maintenance orders.

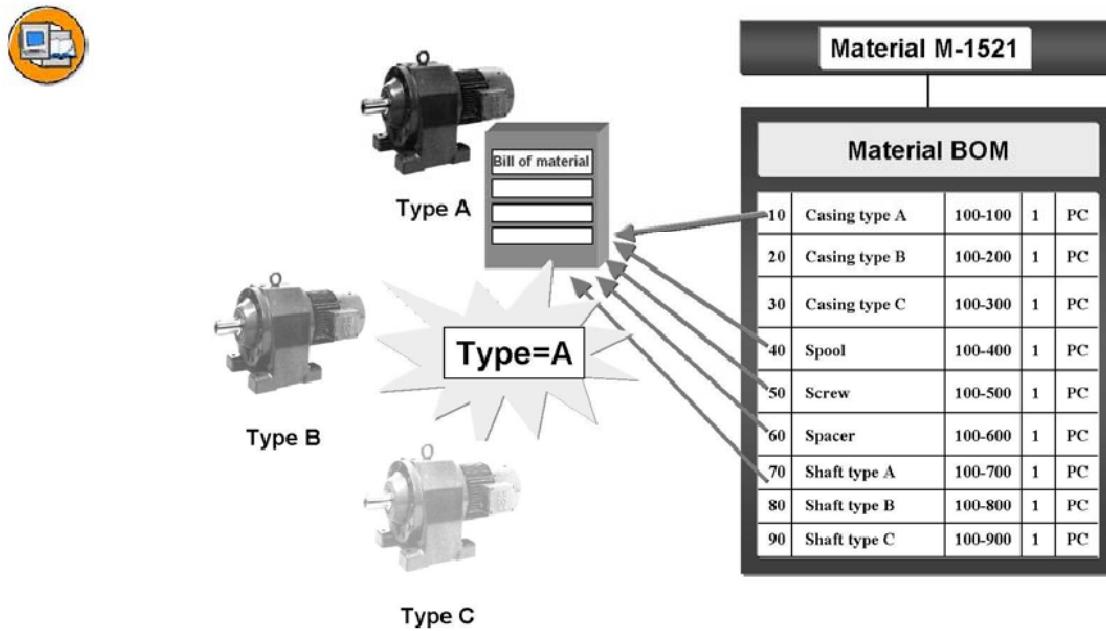


Figure 55: Equipment and Variant BOM

If a maintenance task for which spare parts are required is to be performed for a type A of an object, a configurable piece of equipment can be used.

The equipment BOM is put together by assigning a value to a characteristic from a one-time super BOM (here, type = A).

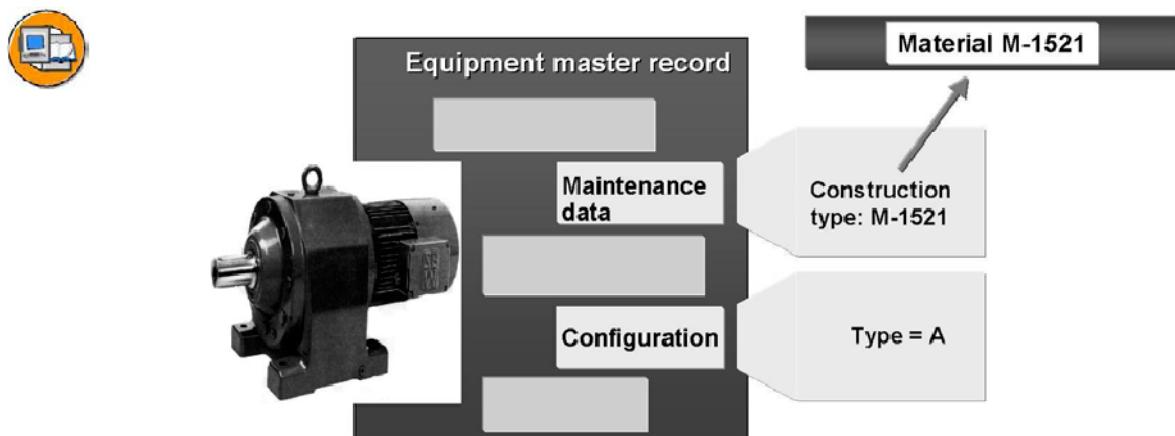


Figure 56: Prerequisites - Equipment Master Record

The equipment master record refers to the configurable material in the “Construction type” field in the “maintenance data”.

In the “Configuration” view, characteristics are evaluated, that is, the required variant is selected.

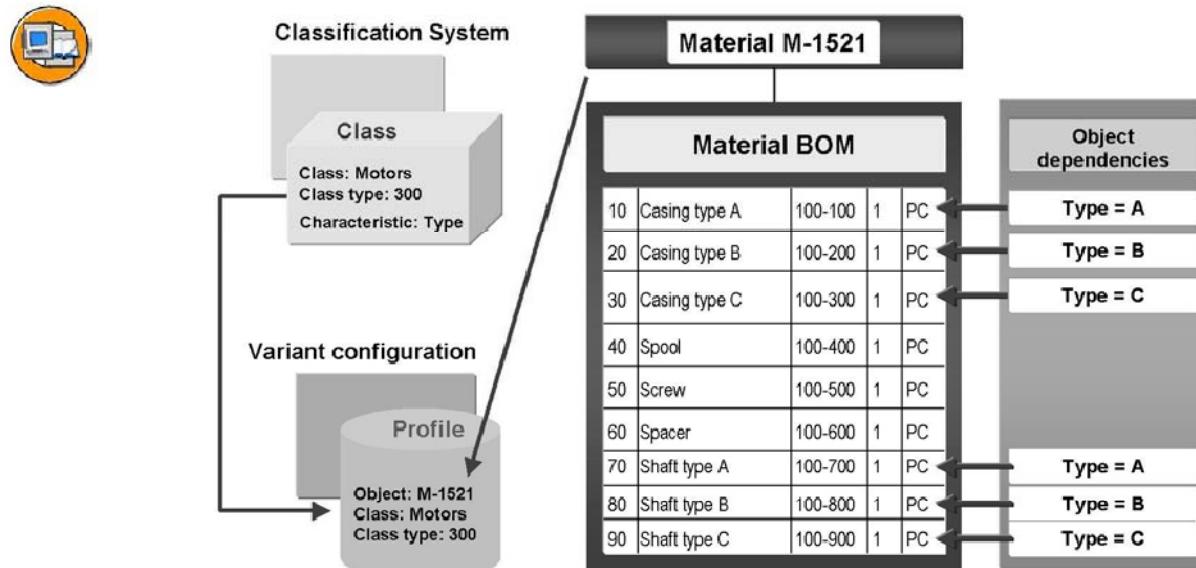


Figure 57: Prerequisites - Class and Profile

First, create a material master record.

Create a bill of material which contains all the materials for the variants to be displayed (super BOM) for this material.

Assign object dependencies to the BOM items that should be controlled by specific variants.

Create a class (for example, motors) in the class system.

Assign characteristics (for example, a characteristic type) to the class.

Create a configuration profile for the material that links class with material. This converts the material into a configurable material.



Lesson Summary

You should now be able to:

- Describe the concept of a configurable bill of material

Lesson: Customizing for Bills of Material

Lesson Overview

This lesson provides an overview of the settings required for BOMs.



Lesson Objectives

After completing this lesson, you will be able to:

- Enter Customizing settings for bills of material

Business Example

The project team has to enter the necessary settings for bills of material.



- Define BOM usage
- Define item categories

Figure 58: BOM Usage and Item Categories

The **BOM usage** defines the relevancy of the item for different areas (engineering/design, costing, maintenance and so on).

The **item category** defines the following:

Whether a material must be entered

Whether the item is to be managed on a quantity basis

Whether the item is purely a text item without additional functions

Whether individual sizes can be entered for the item (variable-size item)

Which quantity sign +/- is supported

Whether sub-items are supported

Whether a maintenance structure element is involved

For maintenance structure elements, no plant verification is performed for the material. You should only use such an item category for items whose sole purpose is to structure maintenance bills of material.

Whether the item is a document item

For document items, you can enter a document that you have created using the Document Management system.

How the screen selection and screen layout for the item detail screens should appear

Exercise 7: Customizing for Maintenance Bills of Material

Exercise Objectives

After completing this exercise, you will be able to:

- Enter the relevant Customizing settings for maintenance bills of material

Business Example

Task:

1. BOM usage

First check in Customizing which uses the bill of material is configured for in Plant Maintenance. How do you proceed?

2. Item Categories

Which item categories are predefined in the system and which default values have been defined for the item?

Solution 7: Customizing for Maintenance Bills of Material

Task:

1. BOM usage

First check in Customizing which uses the bill of material is configured for in Plant Maintenance. How do you proceed?

a) *SAP menu → Tools → Customizing → IMG → Execute Project*

Button *SAP Reference IMG*

Plant Maintenance and Customer Service → Master Data in Plant Maintenance and Customer Service → Bills of Material → General Data → BOM Usage → Define BOM Usages

Use in Plant Maintenance

| Field Name or Data Type | Values |
|-------------------------|--------|
| BOM usg. | 4 |
| Prod. | - |
| Eng./des. | - |
| Spare | - |
| PM | + |
| Sales | - |
| Relevan. | . |

2. Item Categories

Continued on next page

Which item categories are predefined in the system and which default values have been defined for the item?

- a) Item Categories and Default Values for Item

Plant Maintenance and Customer Service → Master Data in Plant Maintenance and Customer Service → Bills of Material → Item Data → Maintain Item Categories

Item Categories

| Field Name or Data Type | Values |
|-------------------------|-----------------------------|
| D | <i>Document item</i> |
| I | <i>PM structure element</i> |
| K | <i>Class item</i> |
| L | <i>Stock item</i> |
| M | <i>Intra-material</i> |
| N | <i>Non-stock item</i> |
| R | <i>Variable-size item</i> |
| T | <i>Text item</i> |

Plant Maintenance and Customer Service → Master Data in Plant Maintenance and Customer Service → Bills of Material → General Data → BOM Usage → Define Default Values for the Item Status

Default values for item status

| Field Name or Data Type | Values |
|-------------------------|--------|
| BOM usg. | 4 |
| Prod. | - |
| Eng./des. | - |
| Spare | - |
| PM | + |
| Sales | - |
| Relevan. | - |



Lesson Summary

You should now be able to:

- Enter Customizing settings for bills of material



Unit Summary

You should now be able to:

- Describe the BOM structure
- List different BOM categories
- Describe the concept of a configurable bill of material
- Enter Customizing settings for bills of material

Unit 4

Serial Numbers

Unit Overview

This chapter deals with the mapping and tracking of individual items from both the Plant Maintenance and Material Management points of view.



Unit Objectives

After completing this unit, you will be able to:

- Describe the reasons for using serial numbers
- Create serial numbers
- Perform the settings in the serial number profile
- Activate the stock check
- Use the stock check for a goods movement
- Make all the necessary settings in the serial number profile

Unit Contents

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Lesson: Application Examples for Serial Numbers

Lesson Overview

This lesson shows the functions and usage of serial numbers using concrete application examples from various company areas.



Lesson Objectives

After completing this lesson, you will be able to:

- Describe the reasons for using serial numbers

Business Example

In a company, it should be possible to track certain material, for example, the goods issue of a single piece of material to a customer. Furthermore, inventory management should be possible for dismantled pieces of equipment that are being stored in the warehouse.

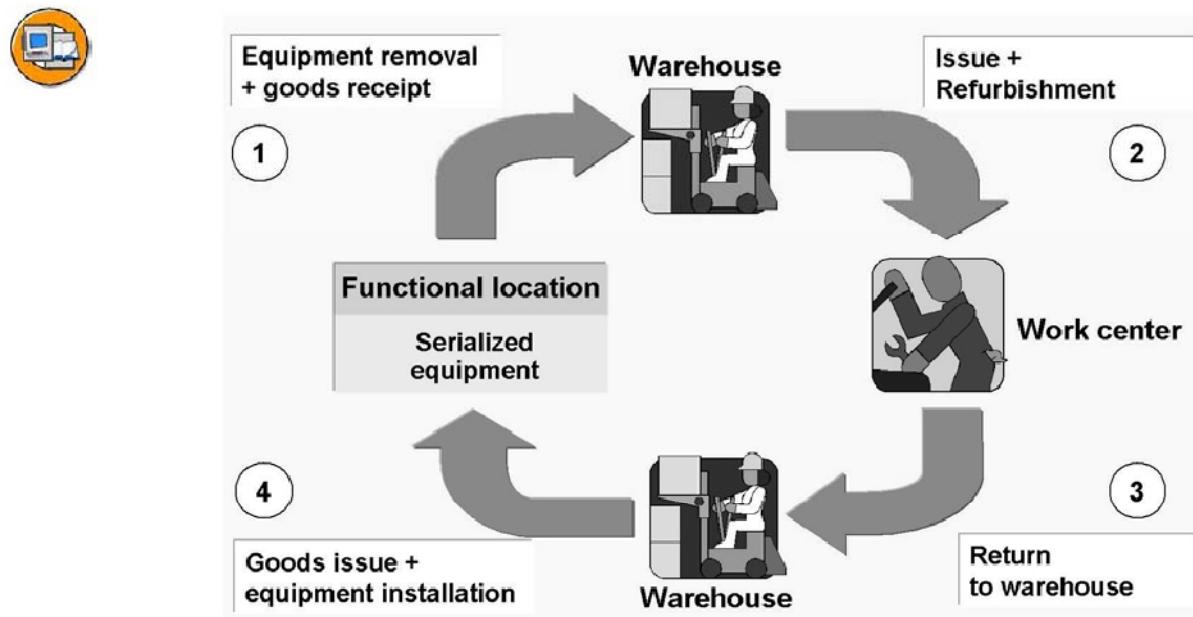


Figure 59: Application Example: Plant Maintenance

1. A faulty piece of equipment has to be dismantled and transferred to the warehouse. A prerequisite for this function is that the equipment is serialized, that is, the tab page for serialization data is activated and a serial number links the equipment to a material.
The defective piece of equipment is dismantled and transferred to the warehouse for refurbishment. You have a function for installing and dismantling equipment with simultaneous goods movement.
2. The defective, serialized equipment should be refurbished. The serial number links the equipment with a material with condition-based evaluation. A material is broken down into different partial stocks by a condition-based evaluation, that is, there are the batches "as new" (C1), "refurbished" (C2) and "faulty" (C3).
3. The refurbished piece of equipment is returned to the warehouse using the linked material and serial numbers.
4. In one step, you can remove a piece of equipment from a storage location and install it at another piece of equipment or functional location.

Serialization thus enables inventory management of pieces of equipment.

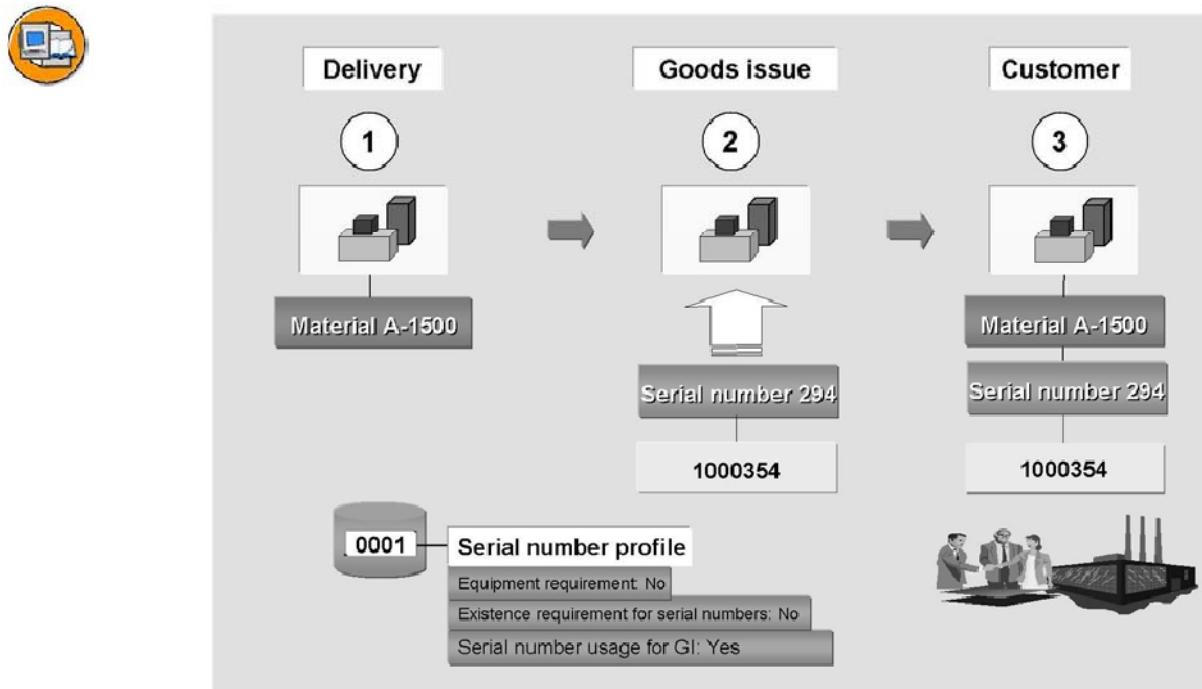


Figure 60: Application Example: Sales / Customer Service

1. A typical request in Sales and Customer Service is that a serialized material item is to be delivered to a customer, on the condition that it should be uniquely identifiable. The material stock can be kept in the warehouse for the present without single items being traced.
2. When the serial number profile is set in the appropriate way, the serialization occurs automatically upon goods issue, meaning that serial numbers are assigned to the individual pieces. If you also made the setting for the equipment requirement in the serial number profile, an equipment master is created automatically upon goods issue, together with the serial number.
3. You can store data relating to the location or the main work center on the basis of the equipment. If the customer makes a complaint, a service message or service order can be recorded for the piece of equipment.



Lesson Summary

You should now be able to:

- Describe the reasons for using serial numbers

Lesson: Working with Serial Numbers

Lesson Overview

This lesson shows how to create serial numbers, what settings in Customizing are necessary for this, and how the serial numbers can then be used effectively.



Lesson Objectives

After completing this lesson, you will be able to:

- Create serial numbers
- Perform the settings in the serial number profile

Business Example

In a company, it should be possible to track certain material, for example, the goods issue of a single piece of material to a customer. Furthermore, inventory management should be possible for dismantled pieces of equipment that are being stored in the warehouse.

Serial Number and Equipment

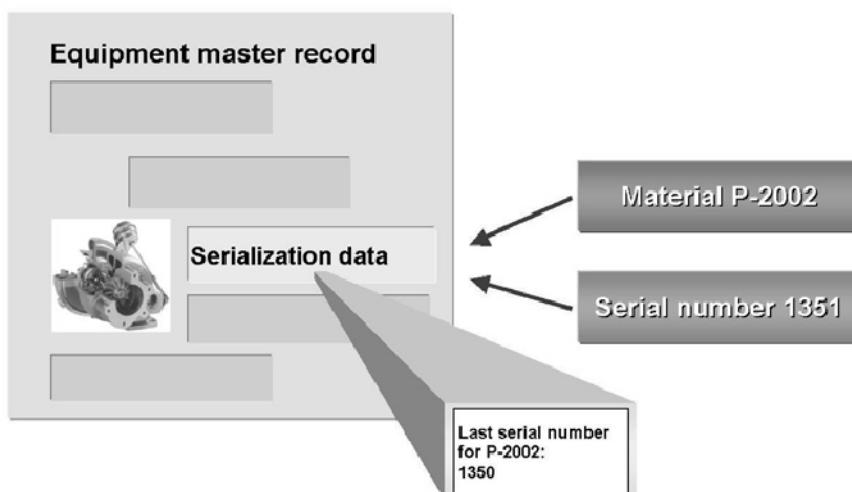


Figure 61: Serial Number and Equipment

Assigning a serial number to a piece of equipment enables the equipment to be managed from an inventory management perspective. When you assign a serial number in the equipment master record, the equipment is linked with a material- and serial number.

This means that you can use the material serial number to also manage the equipment from Plant Maintenance from a Material Management perspective. This is desirable, if, for example, an object that was previously only managed as a piece of equipment is to be dismantled and transferred to the warehouse.

You perform the assignment in the serialization data of the equipment master record. Enter a material that already has a serial number profile for the serialization of individual pieces of equipment in the equipment master record. The last serial number assigned for this material is displayed (if a serial number was already assigned). In this way you can connect the new serial number directly to the last serial number assigned.

You can manage the relationship between the material and the equipment as follows:

You can synchronize the equipment number and the serial number with each other.

You can synchronize the material coupled with the equipment with the material in the *Construction Type* field of the equipment (Structure tab page).

Note:

The standard display of the *Serialization Data* view in the equipment master record can be preset in the Customizing settings for the equipment category. If this view was not activated in Customizing, the tab page can be displayed afterwards.

Serial Number Profile

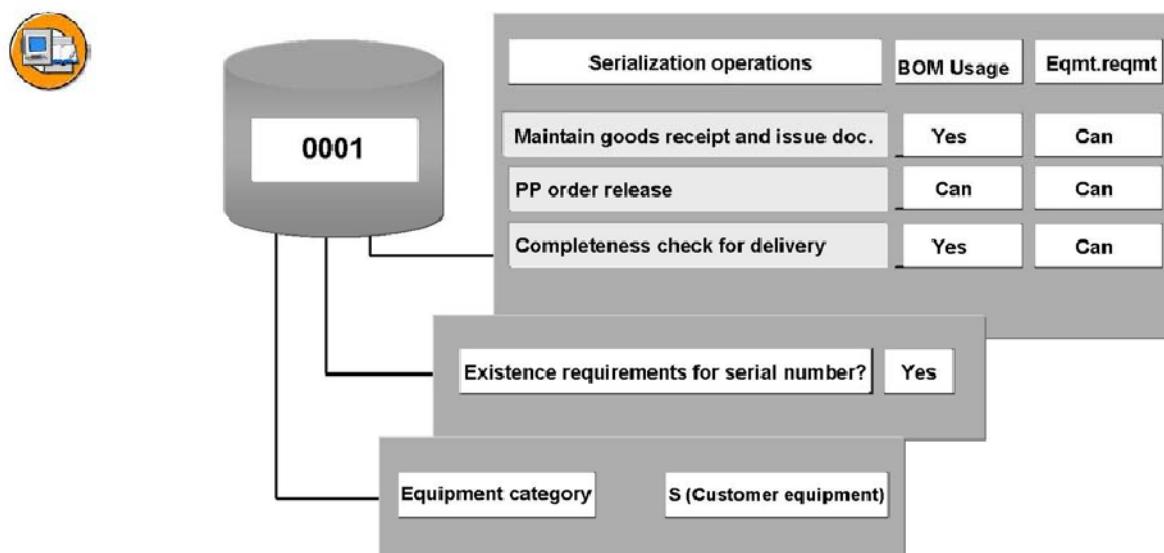


Figure 62: Serial Number Profile

A serial number profile is a group of data stored under a 4-figure key that defines the conditions and the operations for the assignment of serial numbers for material items.

Serial number profiles are defined during system configuration in Customizing of Plant Maintenance.

Structure:

Profile number

Business operations for which serialization can be, must be or is not performed.

Existence requirement for serial numbers

Yes: A serial number must already exist when executing the operation.

No: Serial number is created where necessary when the operation is executed.

Equipment category

Serial Number and Material

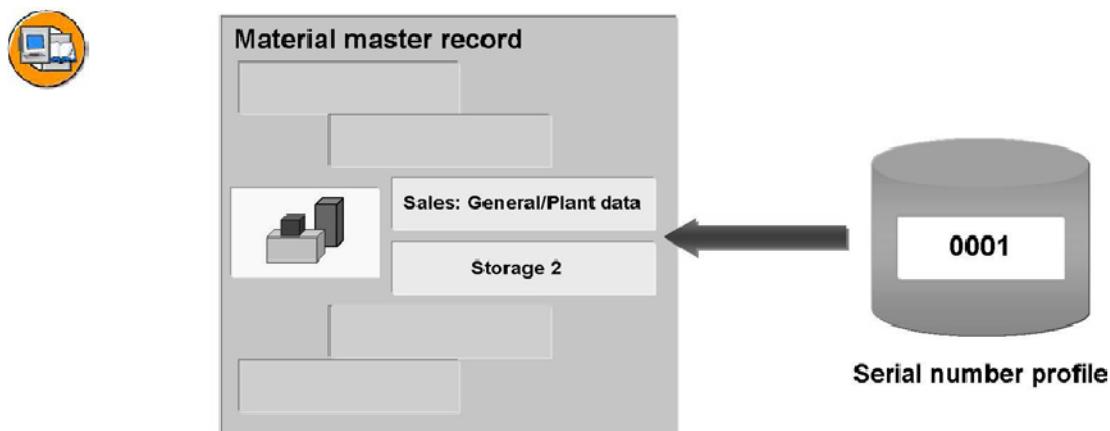


Figure 63: Material and Serial Number

The serial number profile must be entered in the material master record whose individual items are to be assigned serial numbers. It is possible to assign the serial numbers either in the view "Sales: Gen./Plant data" or in "Storage 2".

If assignment is performed in the view *Sales: Gen./plant data*, the profile is displayed automatically in the view

General plant data/Storage 2 (and vice versa).

The combination material/serial number is unique across the client.

Exercise 8: Working with Serial Numbers

Exercise Objectives

After completing this exercise, you will be able to:

- Serialize a piece of equipment
- Handle material and equipment in conjunction with serial numbers for different business management operations

Business Example

In the company, it should be possible to individually track certain objects subject to inventory management, so that in the event of damage, it is possible to reconstruct which individual item was installed in the system. At the same time, maintenance should also be performed for these individually tracked objects.

Task 1:

Your serialized piece of equipment TEW-## is defective. It must be replaced and put into storage.

1. Find the replacement piece of equipment TEW-## in the system.

How do you proceed?

2. Dismantle your piece of equipment TEW-## at the functional location and at the same time place it in storage in plant 1000, storage location 0001, with the movement type 202. The dismantling is assigned to cost center 4110.

(Alternatively: Movement type 262, if the trainer gave you an order for the account assignment of the equipment dismantling).

How do you proceed?

3. Install the replacement piece of equipment TEX-### at the functional location ##-BR2-11. Use the movement type 201 and assign the goods movement to cost center 4110.

Set the mode *Forced installation/removal* How do you proceed?

4. *(Optional)*

You want to be able to activate your equipment TET-## (from the Equipment unit) from a materials management view, for example, to move it into stock for a refurbishment. Display the *Serial Data* view in the master record for TET-##, and *Serialize* your piece of equipment.

Continued on next page

Use material T-FP2## to do this. Note the last serial number to be assigned when doing this.

How do you proceed?

5. **(Optional)**

Display all serial numbers for the material T-FP2#, and check whether your piece of equipment or replacement equipment is displayed.

Task 2:

You receive a delivery of 5 pumps of material T-FP400.

These pumps should also be treated by the system as pieces of equipment.

1. In plant 1000, storage location 0001, create a goods receipt “Other” for this material. Choose movement type 501 as well as the automatic serial number assignment.

How do you proceed?



Hint: Choose the options *Goods Receipt* and *Other*.

2. Synchronization of serial number and equipment number.

Display a list of the automatically generated serial numbers for the material T-FP400. In the list display, show who created the serial numbers.

How do you proceed?

What do you find out?

Which setting must be made in the material master record so that the equipment number and serial number are kept synchronous?

3. Synchronization of material and construction type for serial numbers

Continued on next page

Branch from the serial number list into one of the pieces of equipment that you have created.

How do you proceed?

Go to the *Serial Data* tab page and compare the material with the construction type of the equipment.

What do you find out?

Display the material BOM that was automatically assigned to this piece of equipment.

How do you proceed?



Hint: In the equipment, you have to enter the *Maintenance plant* so that the BOM can be exploded. Use maintenance plant 1000.

Task 3:

Optional exercises for Customer Service

Display serial numbers (Customer Service)

1. Stock Overview

Display the stock overview for material R-1001.

What is the unrestricted-use stock in plant 1200, storage location 0001?

Which material serial numbers belong to this stock?

Continued on next page

2. Display serial number master record

Display the serial number **10000** for your material **R-1001**.

Determine the following data:

Equipment category:

System status:

Equipment number:

Sold-to party:

Number of the sales order with which this device was sold:

3. Displaying Stock Information

Determine the following stock information for serial number **10050** of material **R-1001**.

Plant:

Storage location:

Solution 8: Working with Serial Numbers

Task 1:

Your serialized piece of equipment TEW-## is defective. It must be replaced and put into storage.

1. Find the replacement piece of equipment TEW-## in the system.

How do you proceed?

- a) SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Equipment → List Editing → Find Replacement Equipment

Enter number TEW-## and choose the Execute pushbutton.

The characteristic value assignment is copied from the original object, that is, TEW-##, and can be displayed in the following dialog box using the *Valuation* pushbutton.

Choose the *Execute* pushbutton.



Hint: The replacement equipment search function has also been available for spare parts planning in the maintenance order.

2. Dismantle your piece of equipment TEW-## at the functional location and at the same time place it in storage in plant 1000, storage location 0001, with the movement type 202. The dismantling is assigned to cost center 4110.

(Alternatively: Movement type 262, if the trainer gave you an order for the account assignment of the equipment dismantling).

How do you proceed?

- a) SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Equipment → Removal/Installation with Goods Movement

Choose the *Remove* option. Enter the data and choose the *Save* pushbutton.

3. Install the replacement piece of equipment TEX-### at the functional location ##-BR2-11. Use the movement type 201 and assign the goods movement to cost center 4110.

Continued on next page

Set the mode *Forced installation/removal*? How do you proceed?

- a) **SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Equipment → Removal/Installation with Goods Movement**

Choose the *Install* option. Enter the data and press the button *Forced installation/removal* and then *Save*.



Hint: The *Forced installation/removal* mode is for deactivating the Configuration Control, as it is not required.

4. *(Optional)*

You want to be able to activate your equipment TET-## (from the Equipment unit) from a materials management view, for example, to move it into stock for a refurbishment. Display the *Serial Data* view in the master record for TET-##, and *Serialize* your piece of equipment.

Use material T-FP2## to do this. Note the last serial number to be assigned when doing this.

How do you proceed?

- a) **SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Equipment → Change**

Edit → View Selection > Serial Number

Enter material T-FP2## on the *Serial Data* tab page, ENTER > The last number assigned is displayed – enter the next number for the current piece of equipment accordingly

5. *(Optional)*

Display all serial numbers for the material T-FP2#, and check whether your piece of equipment or replacement equipment is displayed.

- a) **SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Serial Numbers → List Editing → Display**

In the pre-configured variants, the columns *Material*, *Serial Number*, *Equipment*, *Plant* and *Storage Location*, *Description*, *System Status*, *Batch*, *Stock Type* and *Special Stock* are displayed.

You can use the menu bar to integrate additional columns:

Settings → Display variants → Current

Continued on next page

Task 2:

You receive a delivery of 5 pumps of material T-FP400.

These pumps should also be treated by the system as pieces of equipment.

1. In plant **1000**, storage location **0001**, create a goods receipt “Other” for this material. Choose movement type **501** as well as the automatic serial number assignment.

How do you proceed?



Hint: Choose the options *Goods Receipt* and *Other*.

- a) **SAP menu → Logistics → Materials Management → Inventory Management → Goods Movement → Goods Movement (MIGO)**

Choose *Goods Receipt* and *Other*.

Enter the material number, quantity, plant or storage location, and movement type in the detailed data. Set the indicator for *Automatic serial number assignment* (*Serial Numbers* tab page).

2. Synchronization of serial number and equipment number.

Display a list of the automatically generated serial numbers for the material T-FP400. In the list display, show who created the serial numbers.

How do you proceed?

What do you find out?

Which setting must be made in the material master record so that the equipment number and serial number are kept synchronous?

Continued on next page

-
- a) SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Serial Numbers → List Editing → Display or Change

Search for material T-FP400.

A piece of equipment is automatically created in the background for the serial number. The equipment number and serial number are identical.

- b) SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Material → Change

Tab page *General plant data / storage 2*. In the *General plant data* area, the field *Serialization level* is set to 1 (equipment number and serial number kept synchronous).



Hint: The automatic creation of equipment during goods receipt depends on the Customizing of the serial number profile.

3. Synchronization of material and construction type for serial numbers

Branch from the serial number list into one of the pieces of equipment that you have created.

How do you proceed?

Go to the *Serial Data* tab page and compare the material with the construction type of the equipment.

What do you find out?

Display the material BOM that was automatically assigned to this piece of equipment.

Continued on next page

How do you proceed?



Hint: In the equipment, you have to enter the *Maintenance plant* so that the BOM can be exploded. Use maintenance plant 1000.

-
- a) SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Serial Numbers → List Editing → Display or Change

Select material T-FP400 and show the column *Created by* in the hit list. Double click on the number of one of your pieces of equipment to branch to the master record.

- b) The material numbers are identical.
- c) Choose the *Structure List* pushbutton in the equipment master record.

Task 3:

Optional exercises for Customer Service

Display serial numbers (Customer Service)

1. Stock Overview

Display the stock overview for material R-1001.

What is the unrestricted-use stock in plant 1200, storage location 0001?

Which material serial numbers belong to this stock?

Continued on next page

-
- a) SAP menu → Logistics → Customer Service → Management of Technical Objects → Material → Stock Overview

| Field Name or Data Type | Values |
|-------------------------|--------|
| Material | R-1001 |

Execute

| Field Name or Data Type | Values |
|---------------------------|------------|
| Column "Unrestricted use" | 156 pieces |

Position the cursor on the line for plant or storage location and from the menu bar choose **Environment → Equipment/serial no.**

- b) The serial numbers 10044 to 10199 are in stock.
2. Display serial number master record

Display the serial number 10000 for your material R-1001.

Determine the following data:

Equipment category:

System status:

Equipment number:

Sold-to party:

Number of the sales order with which this device was sold:

Continued on next page

- a) SAP menu → Logistics → Customer Service → Management of Technical Objects → Serial Numbers → Display

| Field Name or Data Type | Values |
|-------------------------|--------|
| Material | R-1001 |
| Serial number | 10000 |

Enter

| Field Name or Data Type | Values |
|-------------------------|---|
| Equipment category | S (Customer equipment) |
| System status | INST (equipment installed) ECUS (equipment at customer site) |
| Equipment number | See value |
| Sold-to party | Customer 1032 |

Determine the number of the sales order by choosing *History*. Select the delivery document (brown color) and choose *Document*. In the delivery overview, choose *Document flow*.

3. Displaying Stock Information

Determine the following stock information for serial number **10050** of material **R-1001**.

Plant:

Storage location:

Continued on next page

-
- a) SAP menu → Logistics → Customer Service → Management of Technical Objects → Serial Numbers → Display

| Field Name or Data Type | Values |
|-------------------------|--------|
| Material | R-1001 |
| Serial number | 10050 |

Enter

| Field Name or Data Type | Values |
|-------------------------|--------|
| Plant | 1200 |
| Storage location | 0001 |



Lesson Summary

You should now be able to:

- Create serial numbers
- Perform the settings in the serial number profile

Lesson: Stock Check

Lesson Overview

This lesson shows the stock check for serial numbers that check stock data and the type of movement for a goods movement.



Lesson Objectives

After completing this lesson, you will be able to:

- Activate the stock check
- Use the stock check for a goods movement

Business Example

Stock information should be checked during goods movement.

Stock Check for Serial Numbers

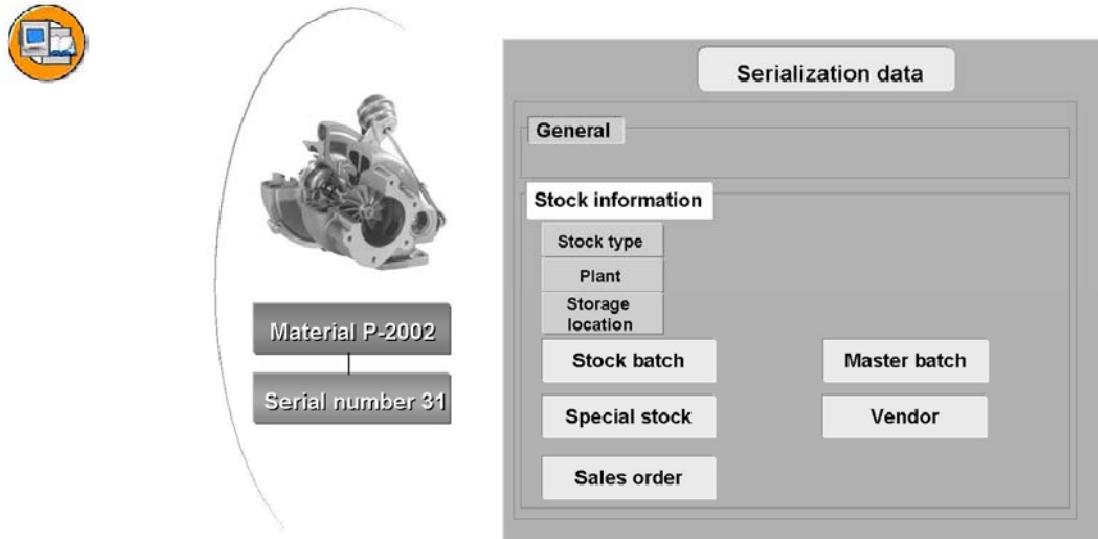


Figure 64: Stock Information in the Master Record

The master record for serial numbers provides the following stock information:

Stock type, plant, and storage location

Stock batch and master batch

Special stocks

Vendor and sales order

The serial numbers are updated not only for plant and storage location, but also for:

All stock types (for example, unrestricted-use stock, stock in quality inspection, blocked stock returns, stock in transfer, stock in transit, blocked stock)

All special stock (for example, open order quantity, project stock, customer and vendor consignment stock)

The following serial number information is updated for each goods movement (including equipment installation and removal): Plant and storage location, batch, movement type, stock type, special stock indicator, sales order number and order item, vendor or customer account number, WBS element.

Serial numbers created before 4.5A do not contain stock information automatically. However, this information is added gradually with each movement of the serial number.

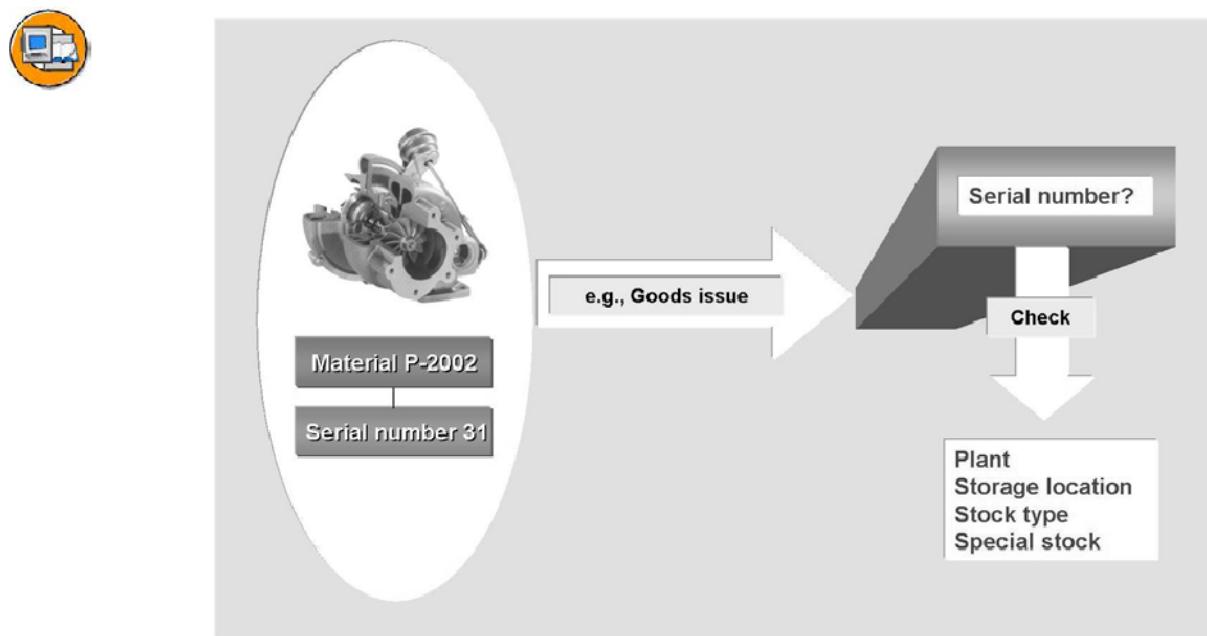


Figure 65: Checks for Goods Movements

If goods are moved, the fields relevant for stock are checked.

For each movement, the system compares this data with the data from inventory management. Depending on the setting for the serial number profile in Customizing, if the data does not correspond, the movement is either prohibited, allowed, or allowed with a warning. After the movement, the serial number is updated with the current stock data from inventory management.

Stock verification must be activated in the serial number profile (Customizing).

Executable programs:

Program **RIMMSF00**: This program compares the stock data from inventory management with that in the master data for the serial number. The cumulative serial number stock is compared with each item of special stock from inventory management.

Program **RISERNR9**: This program is used to copy the stock verification indicator from the serial number profile into the individual serial numbers. The stock verification indicator must then be copied if you have changed the indicator in the profile and already performed goods movements with serial numbers.



- **Serial numbers and inventory**
- **Serial numbers and handling units**
- **Serial numbers - changing part availability information**
- **Serial numbers - internal assignment blocked**



Figure 66: Serial Numbers - Further Functions

You can enter serial numbers when performing a **physical inventory**. This applies to inventory document creation, physical inventory count, and difference posting.

Serial numbers can be entered for items in **Handling units** (for example, boxes, pallets, wire baskets) - they can then only be moved with the handling unit. (Handling units belong to the *Logistics general* area and are packaging-controlled operations).

Under certain conditions you can **change stock information** in the serial number manually.

No plant has been entered

No stock check is active

Stock check is active only with a warning

If several users simultaneously attempt to create serial numbers for the same material number, a **lock** ensures consistent number assignment.

Exercise 9: Stock Check

Exercise Objectives

After completing this exercise, you will be able to:

- Use the stock check for serial numbers

Business Example

The withdrawal of individual items should be checked for the permissibility of the account assignment.

Task 1:

Stock Check

1. What does the stock check of a serial number comprise?
2. How is the stock check configured in Customizing?

Task 2:

Optional

A new pump that is to be used as special stock in a modification project arrives at the warehouse.

1. For material T-FP2## (plant 1000, storage location: 0001), create a special stock for PSP element I/5000-1-2-1. The valuation type is C1 (as new). Perform the necessary settings so that a serial number is assigned automatically and make a note of this number. How do you proceed?
2. A pump breaks down and has to be replaced in filter building K1-B02 of the biological purification plant. Create a maintenance order of order type PM01 for this and release it.

Perform a goods issue for the order created above and use the serial number that you created in part 2-3-1.

What message is displayed by the system when you save?

What system responses can you define?

Why?

Solution 9: Stock Check

Task 1:

Stock Check

1. What does the stock check of a serial number comprise?
 - a) During the stock check of a serial number, the stock batch, master batch, special stock, customer, and sales order are also checked in addition to the plant and storage location if a goods movement occurs. This ensures synchronization of the stock information in the serial number with that in Materials Management.
2. How is the stock check configured in Customizing?
 - a) **SAP menu → Tools → Customizing → IMG → Execute Project**
Button *SAP Reference IMG*
Plant Maintenance and Customer Service → Master Data in Plant Maintenance and Customer Service → Technical Objects → Management of Serial Numbers → Define Serial Number Profiles
The stock check is activated for each serial number profile in the column StkCk. Here, you also define how the system should respond in the event of inconsistencies in the stock data: Warning, error, or no stock check.

Task 2:

Optional

A new pump that is to be used as special stock in a modification project arrives at the warehouse.

1. For material T-FP2## (plant 1000, storage location: 0001), create a special stock for PSP element I/5000-1-2-1. The valuation type is C1 (as new). Perform the necessary settings so that a serial number is assigned automatically and make a note of this number. How do you proceed?
 - a) **SAP menu → Logistics → Materials Management → Inventory Management for Goods Movement → Goods Receipt → Other**
Movement type: 501; special stock: Q; plant: 1000; storage location: 0001; WBS element: I/5000-1-2-1; batch: C1; ENTER
Set the *Create serial number automatically* indicator.

Continued on next page

2. A pump breaks down and has to be replaced in filter building K1-B02 of the biological purification plant. Create a maintenance order of order type PM01 for this and release it.

Perform a goods issue for the order created above and use the serial number that you created in part 2-3-1.

What message is displayed by the system when you save?

What system responses can you define?

Why?

- a) *SAP menu → Logistics → Plant Maintenance → Maintenance Processing → Order → Create*

Reference object: K1-B02; pushbutton: *Release*

SAP menu → Logistics → Materials Management → Inventory Management for Goods Movement → Goods Issue

Movement type **261**, plant **1000**, storage location **0001**, then **ENTER** (**not "To order"**) >as the withdrawal is unplanned

Order number of the order created above, material **T-FP2##**, enter quantity **1** and batch **C1**, **ENTER**

> Serial number query > Enter the serial number already created)

> A warning is issued that the stock data of the serial number does not match the goods movement;

> The warning can be skipped

> The warning is issued because the indicator for the **stock check** in the **serial number profile PM1** has been set to **01 (= warning)**.



Lesson Summary

You should now be able to:

- Activate the stock check
- Use the stock check for a goods movement

Lesson: Customizing for Serial Numbers

Lesson Overview

This lesson shows the necessary settings for working with serial numbers.



Lesson Objectives

After completing this lesson, you will be able to:

- Make all the necessary settings in the serial number profile

Business Example

The project team should in particular store a check for warehouse withdrawals of important individual items which shows whether the withdraw is allowed for the respective account assignment.



- **Serial number profiles**
- **Serialization operations and movement types**

Figure 67: Settings for Serial Number Management

Exercise 10: Customizing for Serial Numbers

Exercise Objectives

After completing this exercise, you will be able to:

- Perform the relevant settings in Customizing

Business Example

The project team should in particular store a check for warehouse withdrawals of important individual items which shows whether the withdraw is allowed for the respective account assignment.

Task:

Customizing – Serial Number Profile

1. Which settings are valid in serial number profile PM1 for goods receipts and goods issues with regard to serial number requirement and equipment requirement?
2. You receive a warning if you change the construction type of one of the pieces of equipment that you generated previously. Where is this system setting made?

Solution 10: Customizing for Serial Numbers

Task:

Customizing – Serial Number Profile

1. Which settings are valid in serial number profile PM1 for goods receipts and goods issues with regard to serial number requirement and equipment requirement?

a) *SAP menu → Tools → Customizing → IMG → Execute Project*

Button SAP Reference IMG.

Plant Maintenance and Customer Service → Master Data in Plant Maintenance and Customer Service → Technical Objects → Management of Serial Numbers → Define Serial Number Profiles

Select row PM1, and click twice on *Serializing procedures* in the column *Dialog Structure*:

There you make the settings for the individual business operations.

| Field Name or Data Type | Values |
|----------------------------|--|
| <i>Procd</i> | <i>MMSL</i> |
| <i>Procedure descriptn</i> | <i>Maintain goods receipt and issue doc.</i> |
| <i>SerUsage</i> | <i>03 (= obligatory)</i> |
| <i>EqR...</i> | <i>02 (= always with equipment)</i> |

2. You receive a warning if you change the construction type of one of the pieces of equipment that you generated previously. Where is this system setting made?

a) *SAP menu → Tools → Customizing → IMG → Execute Project*

Button SAP Reference IMG

Plant Maintenance and Customer Service → Master Data in Plant Maintenance and Customer Service → Technical Objects → Equipment → Equipment Categories → Maintain Equipment Category

For equipment category Z, the setting for synchronizing the construction type and material number is set to *Warning if the construction type and material number are not synchronous*.



Lesson Summary

You should now be able to:

- Make all the necessary settings in the serial number profile



Unit Summary

You should now be able to:

- Describe the reasons for using serial numbers
- Create serial numbers
- Perform the settings in the serial number profile
- Activate the stock check
- Use the stock check for a goods movement
- Make all the necessary settings in the serial number profile

Unit 5

Practical Example: Automobile

Unit Overview

This chapter takes a concrete practical example from a real customer project to illustrate the application of the concepts of technical objects and to give the participants the opportunity to practice this.



Unit Objectives

After completing this unit, you will be able to:

- Describe which structuring element you have used and why, using a practical example that you have processed while working in a group or with partners
- Describe the various solution options, their advantages and disadvantages

Unit Contents

| | |
|---------------------------------|-----|
| Lesson: Practical Example | 168 |
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Lesson: Practical Example

Lesson Overview

This lesson uses a concrete practical example that expands on the concepts of the previous units.



Lesson Objectives

After completing this lesson, you will be able to:

- Describe which structuring element you have used and why, using a practical example that you have processed while working in a group or with partners
- Describe the various solution options, their advantages and disadvantages

Business Example

Your company is an automotive supplier that manufactures seats. You want to display your location (Reifenheim) in the SAP System.

Practical Example: Automotives

1. Starting Point

Your company is an automotive supplier that manufactures seats. You want to display your location (Reifenheim) in the SAP System.

The objects, buildings, and systems at the Reifenheim location should be structured using the SAP Plant Maintenance application component.

2. Available objects

- Workshops: Halls 1-4 (only hall 1 is considered in detail)
- The part of production located in hall 1 consists of: 1 hydraulic frame clamp, 3 fork-lift trucks, electricity supply system, compressed-air ductwork system, water supply, fire alarm system, heating, 15 hand elevating trucks, 80 pneumatic drills
- The frame clamp comprises: 1 press frame, 1 hydraulic press, 1 electrical control, 1 safety device, 3 safety and 7 pressure control valves, 8 flaps, 2 electric motors, 1 set of gears
- General building parts for each hall: Hall floors, ceilings, walls, smoke and heat outlet, 50 windows, 10 skylights

3. Activities

- First consider the following questions:
 - How can the objects or systems be represented using SAP PM resources?
 - How detailed must the structure be?
- Create a suitable structure indicator **S1-##**.
- Create a technical system structure as completely as possible for the Reifenheim location. Start your functional location structure at the uppermost level with **A##**.



Lesson Summary

You should now be able to:

- Describe which structuring element you have used and why, using a practical example that you have processed while working in a group or with partners
- Describe the various solution options, their advantages and disadvantages



Unit Summary

You should now be able to:

- Describe which structuring element you have used and why, using a practical example that you have processed while working in a group or with partners
- Describe the various solution options, their advantages and disadvantages

Unit 6

Measuring Points and Counters

Unit Overview

This chapter shows the mapping of measuring points and counters onto technical objects in order to document and track certain measurement items.

The counters can be used as a basis for performance-based maintenance planning.



Unit Objectives

After completing this unit, you will be able to:

- Describe the basic concept of the measuring point
- Describe the basic concept of the counter
- Enter measurement documents
- Use the measurement transfer
- Perform a counter replacement
- Make all the relevant settings for working with measuring points and counters, and list all the available customer exits for customer enhancements

Unit Contents

| | |
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| Exercise 11: Basic Functions | 179 |
| Lesson: Measurement Document Entry | 183 |
| Exercise 12: Measurement Document Entry | 191 |
| Lesson: Measurement Transfer and Counter Replacement | 197 |
| Exercise 13: Measurement Transfer and Counter Replacement | 201 |
| Lesson: Customizing and Customer Exits for Measuring Points and Counters..... | 205 |

Lesson: Basic Functions

Lesson Overview

This lesson shows the basic functions for measuring points and counters.



Lesson Objectives

After completing this lesson, you will be able to:

- Describe the basic concept of the measuring point
- Describe the basic concept of the counter

Business Example

Your objects have measuring points and counters to record flow quantities or operating hours in order to facilitate better monitoring of capacity utilization.



Technical objects

Figure 68: Measuring Points and Counters

Measuring points are physical and/or logical locations at which a particular condition is described - for example, the temperature of coolant in a nuclear power station after an outflow from the pressure vessels, or the number of rotations per minute of the rotary blades of a wind-driven power station. Measuring points are located at technical objects.

Counters are resources that enable you to represent the wear and tear of an object or the consumption or reduction in its useful life - for example, the mileage indicator of a motor vehicle or the electricity consumption meter of an electrically-powered system. Counters are located at technical objects.

You can enter measurement or counter readings for each object to be maintained. This makes sense if you want to document the condition of an object based on measurement readings or if the regular maintenance of an object depends on its meter readings.

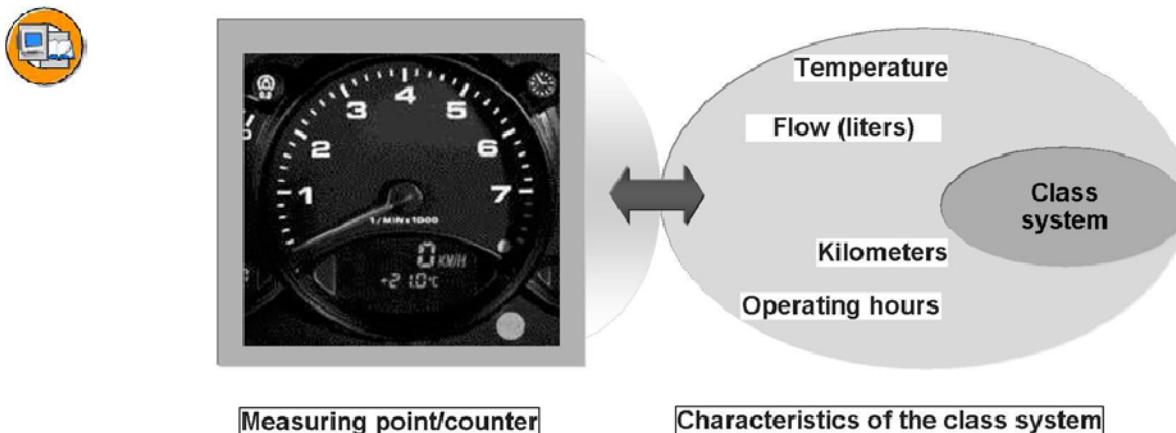


Figure 69: Measuring Point and Characteristics

Each measuring point or counter refers to a characteristic (for example, kilometer, liter, operating hours).

The characteristic of a measuring point or counter determines the characteristic unit in which measurement and counter readings are entered:

The characteristic *Ratio* can, for example, have the characteristic unit *Percent*.

The characteristic *Temperature* can, for example, have the characteristic unit *Degrees Celsius* or *Degrees Fahrenheit*.

Before you begin maintaining the measuring points for your objects, you should create all the characteristics to be used for measuring points in the classification system.

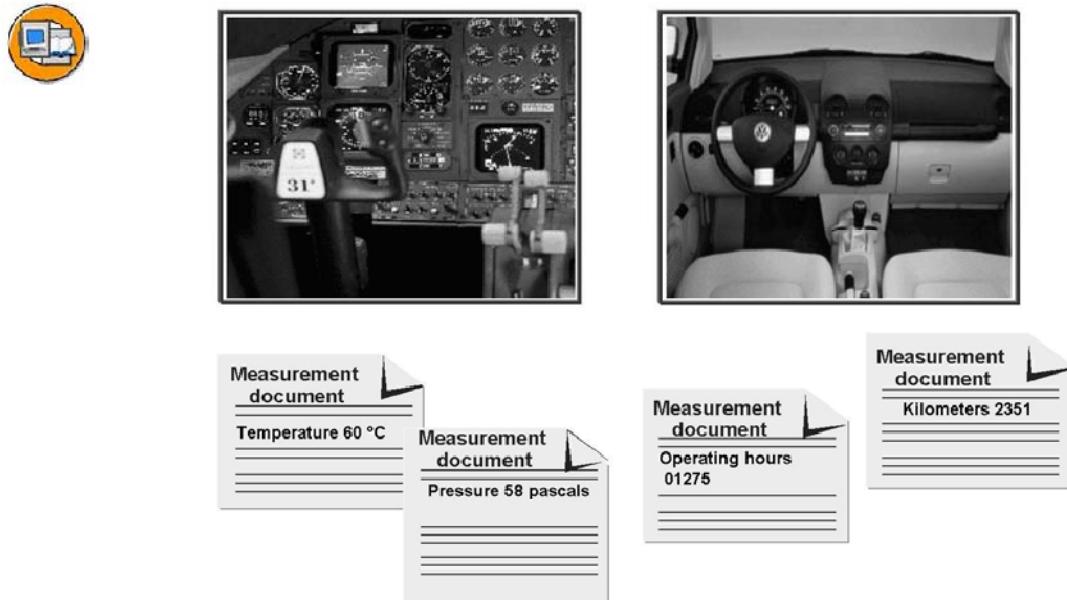


Figure 70: Measurement Documents

A measurement document is the overall term used to describe the data entered in the system after measurement at a measuring point or after a meter reading.

A measurement document consists of the following data sections:

Measuring point data: This refers, for example, to the measuring point number, measurement position, description, characteristic, and unit

Measurement result data: This refers to the precise second when the measurement or reading (time stamp) takes place, the measurement or counter reading respectively, as well as a qualitative assessment of the measurement result if necessary

If necessary, additional information (as short and long text): This refers to the information describing which technician performed the measurement or reading and, if necessary, the number of the measurement document from which the measurement result or counter reading was derived.

In addition, you can assign a processing status to the measurement document. This status can indicate a need for action based on the measurement value or counter reading and whether the need for action based on these readings is already covered by an existing task.



- Current counter readings
- Daily average
- Maintenance dates

Figure 71: Consumption Display for Vehicles

The vehicle master record can display the following consumption data:

Current counter readings

Daily average

Maintenance dates

For this, you must have defined the measurement points or counters that are used to calculate the consumption data of the vehicle. You need a **fuel counter** that measures the fuel consumption. You need a **primary counter** (performance counter) that measures the distance.

A further important prerequisite for displaying the consumption data is a correctly maintained costing procedure.

You can display the overall counter reading of the consumption-relevant fuel counter.

On the basis of the counter readings, you can calculate the average daily consumption of the fleet object, such as the average amount of fuel consumed daily.

If you are implementing maintenance planning, you can display, for example, the next maintenance due date for the fleet object.

Exercise 11: Basic Functions

Exercise Objectives

After completing this exercise, you will be able to:

- Create a measuring point or counter

Business Example

In the company, the load should be monitored for a sequence of aggregates in order to have a complete object history, and a basis for performance-based maintenance planning. A counter for measuring operating hours, for example, is created for this purpose.

Task 1:

A counter should be created for each of the two cleaning water pumps of the middle building of the 2nd biological cleaning plant ##-BR2-2 of your clarification plant, in order to better monitor the load.

1. Create an operating hours counter for each of the aggregates named.
 - Which characteristic do you use?
 - Which numbers are assigned for the counters?
2. Create an initial measurement document with a counter reading for each of the new counters. How do you proceed?

Task 2:

(Optional)

In the company, the heavy goods vehicles (HGVs) are represented in the system as fleet objects to manage the fleet-specific data.

1. Check the counters for the vehicle **Unimog##**. Which counters exist?

Solution 11: Basic Functions

Task 1:

A counter should be created for each of the two cleaning water pumps of the middle building of the 2nd biological cleaning plant ##-BR2-2 of your clarification plant, in order to better monitor the load.

1. Create an operating hours counter for each of the aggregates named.

Which characteristic do you use?

Which numbers are assigned for the counters?

- a) SAP Menu → Logistics → Plant Maintenance → Technical Objects → Functional Location → Structural Display

Enter ##-BR2-2 and execute;

select the cleaning water pumps:

| Field Name or Data Type | Values |
|-------------------------|-----------|
| Cleaning water pump 1 | ##-BR2-21 |
| Cleaning water pump 2 | ##-BR2-22 |

Then branch to the master record detail view; switch to change mode

Extras → Measuring points/counters

| Field Name or Data Type | Values |
|--------------------------------|-----------------------------------|
| Characteristic | For example, OPERATING HOURS_1 |
| Description of measuring point | Operating hours counter |
| Counter ID | ✓ |

Then F3, save > The system displays the next master record – repeat operations accordingly.

Continued on next page

2. Create an initial measurement document with a counter reading for each of the new counters. How do you proceed?

- a) *SAP Menu → Logistics → Plant Maintenance → Management of Technical Objects → Functional Location → Measuring Documents → Create*

Enter the counter number or look for the respective functional location (F4); enter the counter reading and save.

Task 2:

(Optional)

In the company, the heavy goods vehicles (HGVs) are represented in the system as fleet objects to manage the fleet-specific data.

1. Check the counters for the vehicle **Unimog-##**. Which counters exist?

- a) *SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Equipment → Display*

Enter the equipment **Unimog-##**.

Button *Measuring points / counters*

The vehicle has two counters:

| Counter type | Measurement position | Characteristic |
|------------------|----------------------|----------------|
| Distance counter | DISTANCE | Km |
| Fuel counter | FUEL | LITER |



Lesson Summary

You should now be able to:

- Describe the basic concept of the measuring point
- Describe the basic concept of the counter

Lesson: Measurement Document Entry

Lesson Overview

This lesson shows you the various options for entering measurement documents.



Lesson Objectives

After completing this lesson, you will be able to:

- Enter measurement documents

Business Example

Measurement and counter readings are stored as measurement documents in the system. Counter readings form the basis for performance-based preventive maintenance; measurement readings form the basis for condition-based maintenance.

Measurement Document Entry

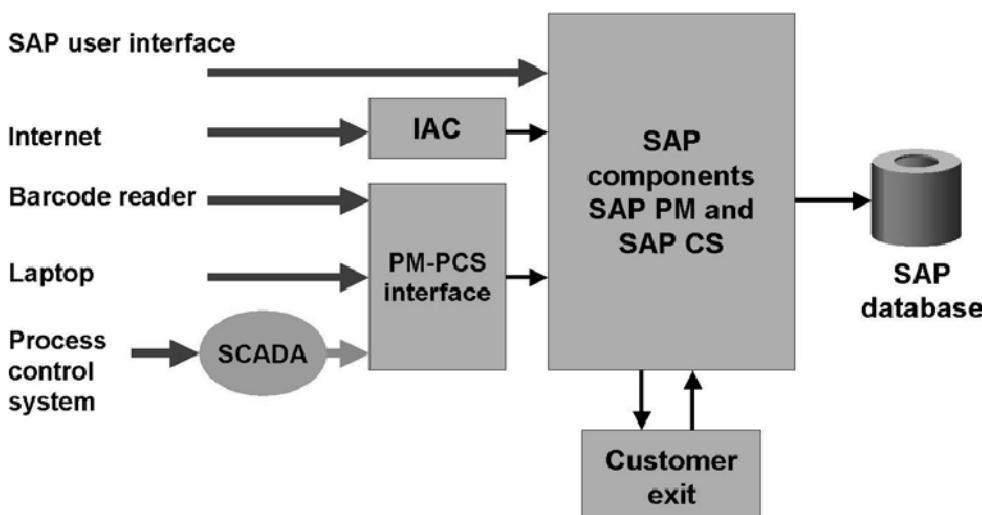


Figure 72: Overview: Measurement Reading Entry

You enter data in the SAP System manually with the help of the SAP user interface. You also have the option of recording measurement readings from a maintenance notification or a maintenance order (fleet management).

Using the **Internet application component** (IAC), you enter data in the input mask in the browser, and transfer it to the SAP System by means of the Internet.

You can enter data using a **barcode reader**, and copy it to the SAP System using the **PM-PCS interface**. The PM-PCS interface is an interface between the SAP system and external systems, such as a process control system (PCS).

You can enter data using a laptop, and copy it to the SAP System using the PM-PCS interface.

Process control system data is data that is created during the monitoring, control, regulation and optimization of a technical process. You can copy this data to the SAP system using the PM-PCS interface.

For this purpose, you can use a SCADA system (Supervisory Control And Data Acquisition System) that filters data from the process control system and only transfers what is really relevant to the SAP System.

Using the **customer exit IMRC0001**, you can automate your business processes and, for example, automatically generate a malfunction report from a measurement document.



Figure 73: Measurement Reading Entry with Mobile End Devices

Mobile scenarios are becoming increasingly important for Plant Maintenance and Customer Service, as they make it possible to process maintenance tasks regardless of location.

In the **mySAP Mobile Business** solution, the functions of mobile maintenance are represented by the **Mobile Asset Management (MAM)**.

We differentiate between the **online scenario** and the **offline scenario**.

For the online scenario, the data is determined, for example, using a mobile telephone (WAP scenario) or a wireless PDA (html). For online scenarios, you always have access to up to date system data on site.

The offline scenario provides functions that allow you to process complex maintenance tasks without being permanently linked to the back-end system. Here, the mobile end device has a local installation consisting of mobile infrastructure and mobile application.

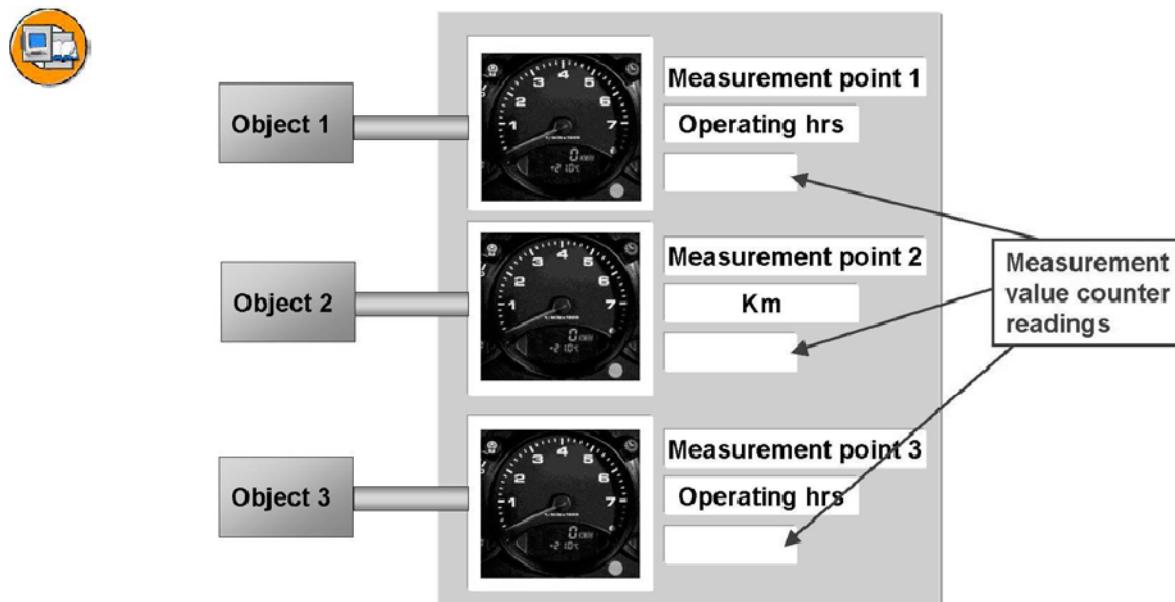


Figure 74: Measurement Reading Entry Using MRE List

To simplify the entry of routine counter and measurement readings for several objects, a **measurement reading entry list** can be created as a master record. This list comprises different measuring points or counters for different objects.

When determining measurement readings or making counter readings, the respective values can be entered directly in this list. As before, the update occurs within a measurement document.

You can print the measurement reading entry list using report RIMELPM1 (using transaction SE38).

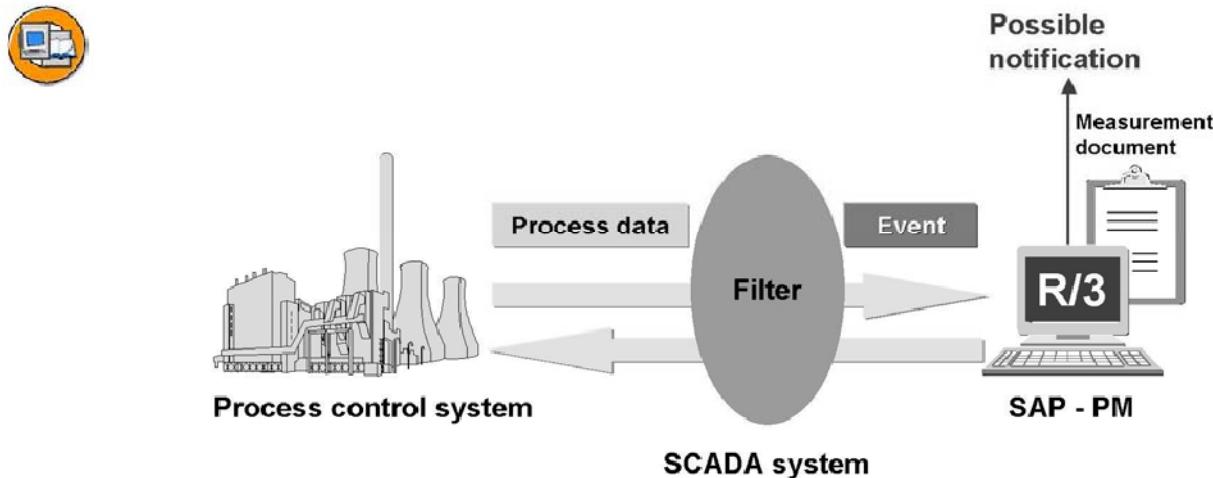


Figure 75: Measurement Recording with PM-PCS Interface

You can use this interface to transfer measurement and counter readings from external systems to the SAP System. The data is saved in measurement documents in the SAP System and can be used by both the SAP PM and SAP CS components.

Performance-based preventive maintenance enables you to plan maintenance based on counter readings that are managed for the technical objects to be maintained.

You can use measurement documents to document the subject for system security, work safety and environmental protection.

Possible external systems:

Mobile data entry systems

Process control systems (PCS)

Building control systems

SCADA systems (Supervisory Control And Data Acquisition Systems)

Process control systems provide a wide range of data for processes, buildings or infrastructure. SCADA systems perform a filtering function here. They filter out maintenance-relevant data, and thereby protect the R/3 System from an excess of process data. In addition, SCADA systems are responsible for the communication between one or more process control systems and the SAP System.

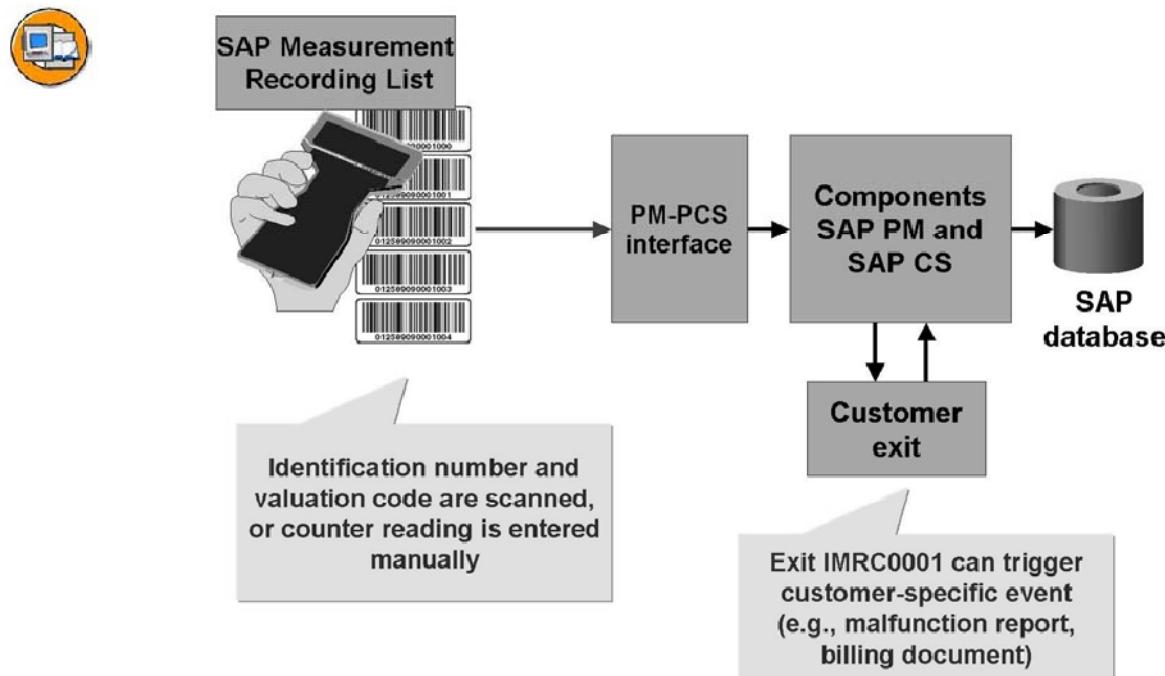


Figure 76: Measurement Recording with Barcode

For example: You have mapped an apartment building in the SAP System by means of a functional location hierarchy. A current meter represented by means of a barcode ID is assigned to each apartment, and is read once a year. The technician who reads the meter enters the meter reading result in the barcode reader manually by means of a block of numerals. Consumption billing is performed in the SAP System in the industry sector component *Real Estate* (RE) on the basis of the counter readings recorded. See Note 5196 in SAPNet for information on the prerequisites if you want to print barcodes with SAPscript using the SAP System.

When preparing the work, you compile the measuring points and counters for the technician in the order of the round. In the SAP System, this is shown as the measurement recording list. The technician first scans the barcode ID for each measuring point and counter using a barcode reader, and then enters the counter reading manually. After the round has been ended, you transfer the data from the technician's barcode reader to the docking station using infrared signals. The barcode reader supplies the data which is copied to the SAP System using the PM-PCS interface. The SAP System creates a measurement document for each measurement reading and counter reading. If you use the customer exit IMRC0001, the measurement document serves as the basis for a consumption billing in the industry sector component Real Estate (RE).

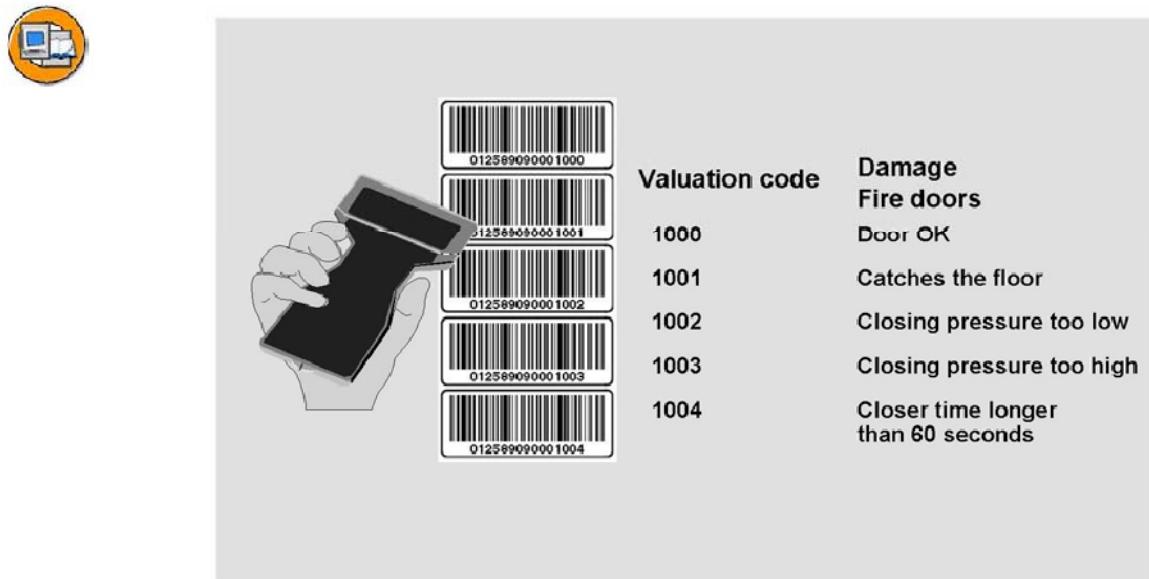


Figure 77: Barcode and Valuation Code

You can also use the catalog system to enter measurement or counter readings. The catalog system enables you to define permissible values for a measuring point that you can select using the catalog hierarchy when entering measurement readings. You can use this function when you want to predefined qualitative or descriptive measurement readings in the catalog system, or if you want to use these predefined values when entering counter readings:

System reaction when the measurement reading is exceeded.

Permissible tolerance time for entering future measurement readings.

Example: You have mapped a building, including the fire doors, in the SAP System using a functional location hierarchy. A measuring point represented by means of a barcode ID is assigned to each fire door. A meter reader checks each individual fire door once a month. The inspection result is usually "Door OK", but this result should also be documented in the SAP System.

Possible damage can be shown clearly as valuation codes. The meter reader also enters these valuations codes by means of a barcode. Damage identified during the inspection should automatically trigger a malfunction report in the SAP System.

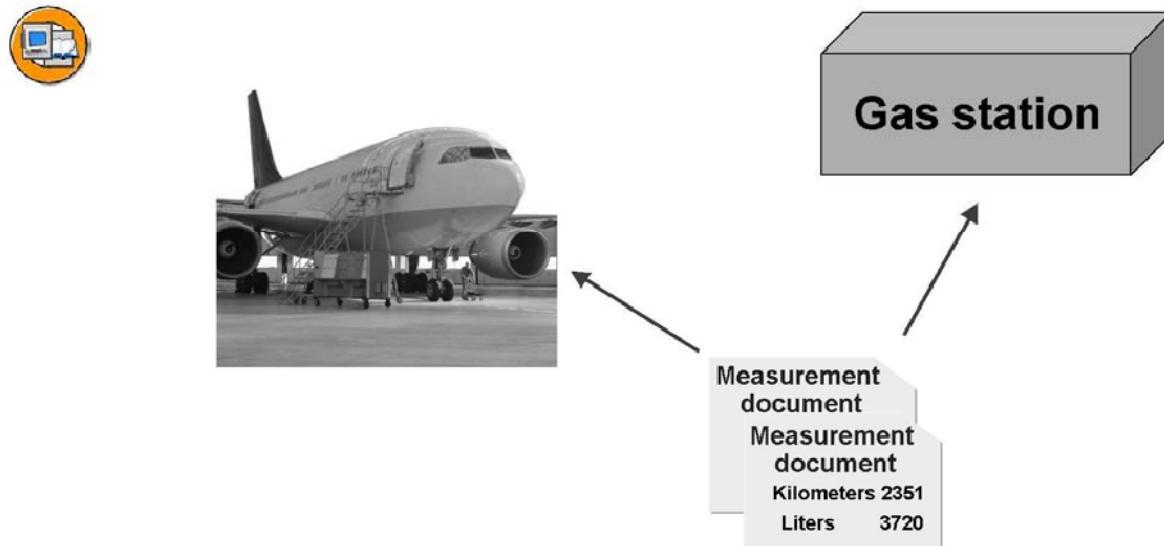


Figure 78: Consumption-Relevant Counter Reading Recording

For the consumption-relevant counter reading recording, you can enter counter readings (for example, liters, kilometers, operating hours), the fuel, and the gas station from which the fuel came, on one screen.

For a material withdrawl, the material documents for the consumption of a fleet object can be directly posted to a gas station represented in the system.

The new functions in the area of Fleet Management complement the existing counter reading recording and reporting for fleet objects. These functions take into consideration the peculiarities of fleet objects and make it significantly simpler to manage fleet-relevant data on a daily basis.

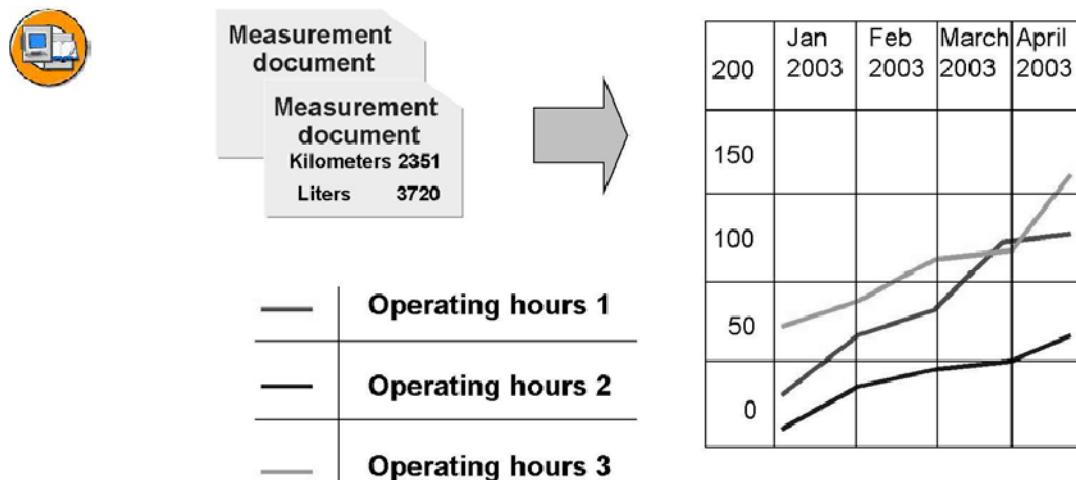


Figure 79: Measurement Document List in Graphical Form

The measurement documents can also be represented in a graphic form. You are connected to the Graphical Framework (GFW), which can be used to control various external graphic tools.

This has the following advantages:

It is easier to recognize the values.

The time axis is automatically scaled.

The values of various measuring points can be displayed simultaneously.

As the GFW is web-enabled, it can also be used in iViews or in wireless PDAs.

Exercise 12: Measurement Document Entry

Exercise Objectives

After completing this exercise, you will be able to:

- Enter measurement documents

Business Example

Measurement and counter readings are documented in the system with measurement documents.

Task 1:

Measurement reading entry list

1. You should perform further counter reading entries for the aggregates in the mechanical purification of your clarification plant using a predefined measurement reading entry list that contains all the necessary counters.

Create this measurement reading entry list for the technical objects listed above.

How do you proceed?

Which numbers are assigned for the measurement reading entry list?

2. Enter the counter readings for the ventilator, sand and fat traps in the mechanical purification plant using the measurement reading entry list already created.

How do you proceed?

Task 2:

(Optional)

1. The measurement documents for one of your HGVs have not been entered yet. Enter 6 measurement documents for the Unimog-## fleet object. Use the following data:

| Measuring time point | 21 days ago | 14 days ago | 7 days ago |
|--------------------------|-------------|-------------|------------|
| Consumption (in l) | 140 | 140 | 140 |
| Counter readings (in km) | 700 | 1400 | 2100 |

How do you proceed?

Continued on next page

2. Today your Unimog was refueled at the local gas station 001. Enter the counter reading of 2600 km. At the same time, enter the consumption of 140 l of the fuel type DI in the system. How do you proceed?
3. The fueling at the gas station is represented as a goods movement in the system. Display the material document for this goods movement, as well as the stock overview for the material *Diesel*.
4. Select all the fleet objects that use diesel as their primary fuel.
How do you proceed?

Display the master record of your **Unimog-##**. Note the average values of the corresponding fleet object information.

| | | |
|------------------------|-----------|-----------|
| Period (Days) | 30 | 10 |
| Daily Avg Acty | | |
| Daily Ave. Fuel | | |
| Avg consumption | | |

Solution 12: Measurement Document Entry

Task 1:

Measurement reading entry list

1. You should perform further counter reading entries for the aggregates in the mechanical purification of your clarification plant using a predefined measurement reading entry list that contains all the necessary counters.

Create this measurement reading entry list for the technical objects listed above.

How do you proceed?

Which numbers are assigned for the measurement reading entry list?

- a) *SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Environment → Measuring Points → Measurement Reading Entry List → Create*

Enter a short text, ENTER; enter a description;

Edit → Select measuring points

Enter ##-M in the field *Functional Location*, and execute

> Mark all and select

> Save and make a note of the measurement reading entry list.

2. Enter the counter readings for the ventilator, sand and fat traps in the mechanical purification plant using the measurement reading entry list already created.

How do you proceed?

- a) *SAP menu → Logistics → Plant Maintenance → Maintenance Processing → Completion Confirmation → Measurement Documents → Collective Entry → With Entry List*

Enter the number of the entry list

>The counters are ready for input

> Enter the counter reading and save

Continued on next page

Task 2:

(Optional)

1. The measurement documents for one of your HGVs have not been entered yet. Enter 6 measurement documents for the **Unimog-##** fleet object. Use the following data:

| Measuring time point | 21 days ago | 14 days ago | 7 days ago |
|--------------------------|-------------|-------------|------------|
| Consumption (in l) | 140 | 140 | 140 |
| Counter readings (in km) | 700 | 1400 | 2100 |

How do you proceed?

- a) *SAP Menu → Logistics → Plant Maintenance → Management of Technical Objects → Equipment → Measurement Documents → Enter Usage for Vehicles*

Enter the equipment **Unimog-##**.

Set the (historical) measuring time point before entering the counter readings and enter the counter readings in accordance with the defaults.

2. Today your Unimog was refueled at the local gas station 001. Enter the counter reading of 2600 km. At the same time, enter the consumption of 140 l of the fuel type DI in the system. How do you proceed?

- a) *SAP Menu → Logistics → Plant Maintenance → Management of Technical Objects → Equipment → Measurement Documents → Enter Usage for Vehicles*

Enter the equipment **Unimog-##** and the gas station 001.

Enter the counter readings and the fuel type DI.

Continued on next page

3. The fueling at the gas station is represented as a goods movement in the system. Display the material document for this goods movement, as well as the stock overview for the material *Diesel*.

- a) ***SAP Menu → Logistics → Materials Management → Inventory Management → Material Document → Display***

Use the F4 search help to find the material document. Select using your username **PLM305 - ##** and the material number **Diesel**.

Place the cursor in the Material field and choose the function ***Environment → Stock Overview → Stock Material*** to display the current stock overview. Alternatively, you can use transaction **MMBE** for the stock overview, or use transaction **MB51** to display the list of material documents.

4. Select all the fleet objects that use diesel as their primary fuel.

How do you proceed?

Display the master record of your **Unimog - ##**. Note the average values of the corresponding fleet object information.

| | | |
|-----------------|----|----|
| Period (Days) | 30 | 10 |
| Daily Avg Acty | | |
| Daily Ave. Fuel | | |
| Avg consumption | | |

- a) ***SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Equipment → List Editing → Display Vehicles***

Enter the fuel type **DI** in the *Primary Fuel* field and confirm with **F8**.

- b) Select your fleet object **Unimog - ##**.

On the *Vehicle – Technology* tab page, display the vehicle information in the *Fuel and Lubricant* screen area.



Lesson Summary

You should now be able to:

- Enter measurement documents

Lesson: Measurement Transfer and Counter Replacement

Lesson Overview

This lesson shows you the options for transferring measurements and replacing counters.



Lesson Objectives

After completing this lesson, you will be able to:

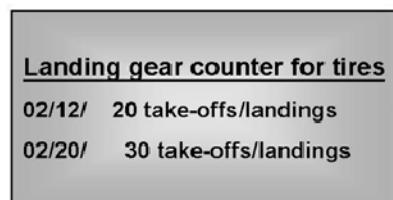
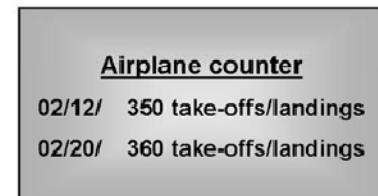
- Use the measurement transfer
- Perform a counter replacement

Business Example

In complex technical objects (such as airplanes) measurement and counter readings can be transferred automatically by means of a hierarchy.

If a counter is defective, it has to be replaced. In the SAP System, this is entered as a special measurement document.

Measurement Transfer and Counter Replacement



Difference of 10
take-offs/landings
carried forward

Figure 80: Transfer of Measurement and Counter Readings

The following types of transfer are possible:

Measurement transfer from one measuring point to another (1:1 relationship)

Measurement transfer from one measuring point to a number of others (1:n relationship)

Counter reading transfer from one counter to another (1:1 relationship)

Counter reading transfer from one counter to a number of others (1:n relationship)

A transfer of measurement and counter readings assumes the following:

Both measuring points or counters must have the same characteristic.

Both measuring points or counters must be in the same object hierarchy. Measurement and counter readings cannot be transferred from external object hierarchies.

In the counter reading transfer, you can make use of **interval documents**. The counter readings from the subordinate levels of an asset structure are thereby aggregated into recurring entry documents. This considerably reduces the volume of measurement documents. The same measurement document is used for as long as the equipment is installed at the same functional location or superordinate piece of equipment. This means that there is only one measurement document for each installation interval of a piece of equipment.



- Entry of measurement document with historical reference time
- Transfer of measurement document similar to historical object structure

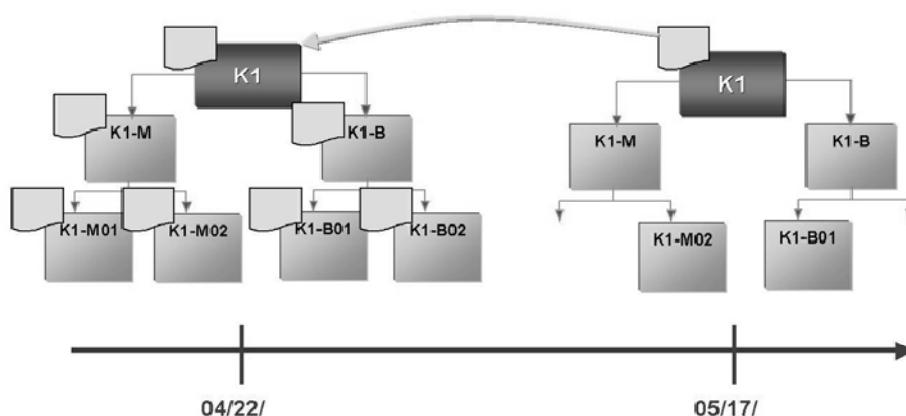


Figure 81: Time-Based Counter Reading Transfer I

If a measurement document is entered for a historical reference time, it is transferred according to the object structure that was valid at the reference time, even if the object structure has changed in the meantime.

The structure of the functional location K1 has changed since 22.04. At that time, there were two additional functional locations (K1-M01 and K1-B02).

On 17.05, you enter a measurement document with reference date 22.04.

The values of the measurement document in the functional location structure are then transferred for the structure that was valid on 22.04, in other words, the system also transfers the values to functional locations K1-M01 and K1-B02.



- Generation or cancellation of measurement documents upon modification with a historical reference time

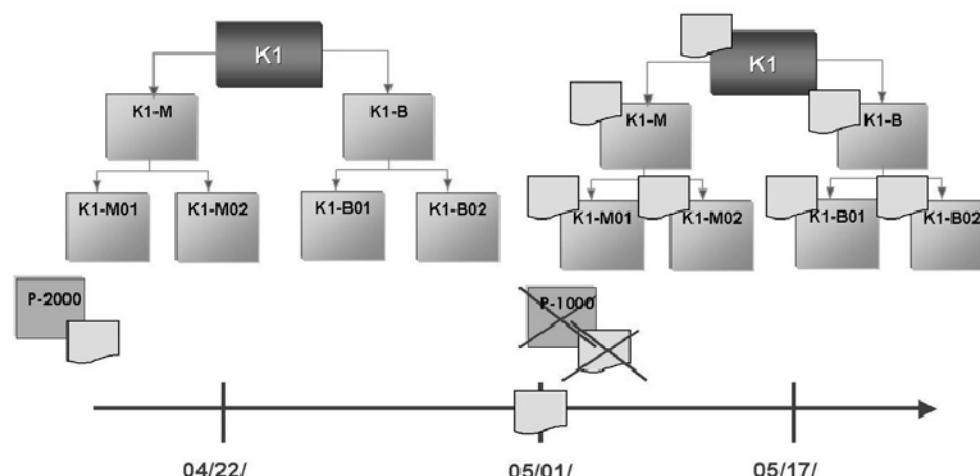


Figure 82: Time-Based Counter Reading Transfer II

If you install or dismantle a piece of equipment with a historical reference time, the system automatically cancels superfluous measurement documents and creates new ones, if necessary.

Example: You entered a measurement document on 01.05. This has been transferred to equipment P-1000 using the functional location hierarchy.

On 17.05, you enter that equipment P-1000 is replaced by equipment P-2000 with a historical reference date 22.04.

The measurement document is then deleted for equipment P-1000, since this had not yet been installed when the measurement document was created on 01.05.

However, a measurement document is generated for equipment P-2000, since this had already been installed when the measurement document was created.



- **Represent counter replacement**

| Meter read.date | Counter read | Indicator | Total counter reading |
|-----------------|--------------|---------------------|-----------------------|
| 08/17/ | 20010 | | 20010 |
| 08/24/ | 20100 | | 20100 |
| 08/31/ | 20190 | | 20190 |
| 09/04/ | 00400 | Counter replacement | 20190 |
| 09/10/ | 00410 | | 20200 |

Figure 83: Counter Replacement

The replacement of a counter must be displayed in the system if its register is defective and must be replaced by a new one, or if the entire counter must be renewed. As the reading of the new counter is usually not the same as that of the old one, the newly-entered measurement document is flagged to explain the discrepancy in the continually rising or falling readings.

If you enter a measurement document that documents a counter replacement, the overall counter reading itself does not change. You enter the new reading of the newly-installed counter at the start of usage with this measurement document. This does not change the overall counter reading of the previous measurement document.

Exercise 13: Measurement Transfer and Counter Replacement

Exercise Objectives

After completing this exercise, you will be able to:

- Perform a counter replacement

Business Example

In complex technical objects (such as airplanes) measurement and counter readings can be transferred automatically by means of a hierarchy.

If a counter is defective, it has to be replaced. In the SAP System, this is entered as a special measurement document.

Task:

The counter of the ventilator ##-M01-2 in the sand trap is defective and must be replaced. Perform a counter replacement.



Hint: First check the reading on the counter and, if applicable, enter an initial measurement document.

1. How is a counter replacement shown in the system?
2. Which value is entered and what effect does this value have?
3. Perform the counter replacement. How do you proceed?

Enter another measurement document with a new counter reading. How do you proceed?

4. Display all measurement documents of the operating hours counter at the ventilator. How can you show the counter replacement in the list?

Solution 13: Measurement Transfer and Counter Replacement

Task:

The counter of the **ventilator ##-M01-2** in the sand trap is defective and must be replaced. Perform a counter replacement.



Hint: First check the reading on the counter and, if applicable, enter an initial measurement document.

1. How is a counter replacement shown in the system?
 - a) Using a measurement document
2. Which value is entered and what effect does this value have?
 - a) The current counter reading of the new counter is entered. At the same time, the overall counter reading of the old counter is retained. The difference for this measurement document is set to zero.
3. Perform the counter replacement. How do you proceed?

Enter another measurement document with a new counter reading. How do you proceed?

- a) *SAP menu → Logistics → Plant Maintenance → Maintenance Processing → Completion Confirmation → Measurement Documents → Create*

Enter the counter number

Edit → Replace counter

Enter the reading of the new counter

>The difference is zero

>The overall counter reading of the old counter is retained and updated when you enter new measurement documents

Continued on next page

4. Display all measurement documents of the operating hours counter at the ventilator. How can you show the counter replacement in the list?
 - a) *SAP menu → Logistics → Plant Maintenance → Maintenance Processing → Completion Confirmation → Measurement Documents → List Editing → Create*
Enter the number of the measuring point and execute
Settings → Display variants → Current
Sort the fields in the right-hand box in ascending order; select the field *Counter replacement*, and copy



Lesson Summary

You should now be able to:

- Use the measurement transfer
- Perform a counter replacement

Lesson: Customizing and Customer Exits for Measuring Points and Counters

Lesson Overview

This lesson shows the necessary Customizing settings for working with measuring points and counters.



Lesson Objectives

After completing this lesson, you will be able to:

- Make all the relevant settings for working with measuring points and counters, and list all the available customer exits for customer enhancements

Business Example

In the company, there should be different categories of counters, depending on the technical object.

Customizing for Measuring Points and Counters



- Measuring point categories

Figure 84: Measuring Points and Counters

You require measuring point categories to enter measurement or counter readings.

The measuring point category defines:

Whether a measurement item is unique. You can use the uniqueness check for the measurement item to prevent a measurement item from being defined multiple times for each object or even object-wide.

Which catalog type is used for the measurement recording. You can use this function when you want to predefine qualitative or descriptive measurement readings in the catalog system, or if you want to use these predefined values when entering counter readings.

System reaction when the measurement reading is exceeded.

Permissible tolerance time for entering future measurement readings.



- **IMRC0001 (before updating)**
 - Definition of specific field contents in measuring points and measurement documents
 - Generation of Workflow events
 - Update of user-defined tables
- **IMRC0002 and IMRC0003 (menu exits in dialog processing)**
 - Triggering of customer-specific functions
 - Calling up user-defined screens



Figure 85: Customer Exits



Lesson Summary

You should now be able to:

- Make all the relevant settings for working with measuring points and counters, and list all the available customer exits for customer enhancements



Unit Summary

You should now be able to:

- Describe the basic concept of the measuring point
- Describe the basic concept of the counter
- Enter measurement documents
- Use the measurement transfer
- Perform a counter replacement
- Make all the relevant settings for working with measuring points and counters, and list all the available customer exits for customer enhancements

Unit 7

Additional Functions

Unit Overview

This chapter deals with additional functions for technical objects.



Unit Objectives

After completing this unit, you will be able to:

- List the available object services
- Assign a partner to a technical object
- Use the address management
- Link a document master record with a technical object
- List the options of the CAD interface
- Define a status profile
- Assign and use a status profile
- Assign a warranty to a technical object
- Use the warranty in the notification and order
- Describe the IBIP transaction
- Briefly describe the functionality of object networks
- Describe the archiving process

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Lesson: Object Services

Lesson Overview

This lesson shows you the generic object services.



Lesson Objectives

After completing this lesson, you will be able to:

- List the available object services

Business Example

In the company, object services can be used to improve the communication.

Object Services



- **Sending an object with SAP Office (functional locations, pieces of equipment, notifications, orders, task lists, maintenance plans and work centers)**
- **Including PC files (for example, a Word document) in the object**

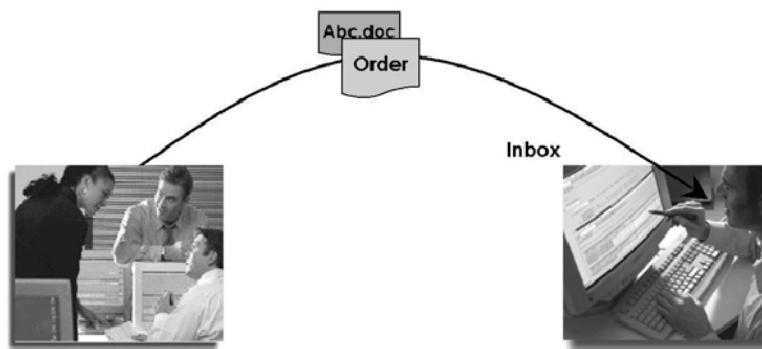


Figure 86: Examples of Object Services

The generic object services provide functions that are available in different SAP applications, and that can be called and used from everywhere.

For example, when processing a piece of equipment, you can call the function *Send object* in SAP Office to send a mail to an SAP user or distribution list. This generates a message in the inbox of the addressee, with the equipment master record as an attached object.

The object link is another example of a generic object service. Linking means that you can link the object (such as a piece of equipment) with a PC file (such as a photo, text document).

Exercise 14: Object Services

Exercise Objectives

After completing this exercise, you will be able to:

- Link an object master record with an Internet page
- Send a master record to a colleague using the object service

Business Example

Technical notes, repair instructions and so on are being offered on an increasingly frequent basis on the manufacturer's homepage. Use should be made of this at the company by linking particular object master records directly with the corresponding WWW page.

Task 1:

Create an object link to the SAP Homepage in the master record of your piece of equipment TET-##.

1. How do you proceed?

Task 2:

Your colleague who is responsible for the maintenance of equipment master records should approve a change that you have made. Send the master record of your piece of equipment TET-## to your neighbor using the Office functions.

1. How do you proceed?

Solution 14: Object Services

Task 1:

Create an object link to the SAP Homepage in the master record of your piece of equipment TET-##.

1. How do you proceed?

- a) *SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Equipment → Change
System → Services for Object*

Press the *Create* button and select the option *Create external document (URL)*

> Complete the address in the popup: <http://www.sap.com>

> The system generates an entry in the list of existing links > You can branch to the Internet page by clicking twice on this entry

(Prerequisites: an installed browser and Internet access)

Task 2:

Your colleague who is responsible for the maintenance of equipment master records should approve a change that you have made. Send the master record of your piece of equipment TET-## to your neighbor using the Office functions.

1. How do you proceed?

- a) *SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Equipment → Change
System → Services for Object*

Press the *Send object with note* button, enter recipient PLM305 - ## and select recipient type *SAP logon name*.



Lesson Summary

You should now be able to:

- List the available object services

Lesson: Partners and Addresses

Lesson Overview

This lesson shows the options for storing contact persons and addresses in technical objects.



Lesson Objectives

After completing this lesson, you will be able to:

- Assign a partner to a technical object
- Use the address management

Business Example

In the company, you want to store the vendors as contact persons in the technical objects.

Partners and Addresses

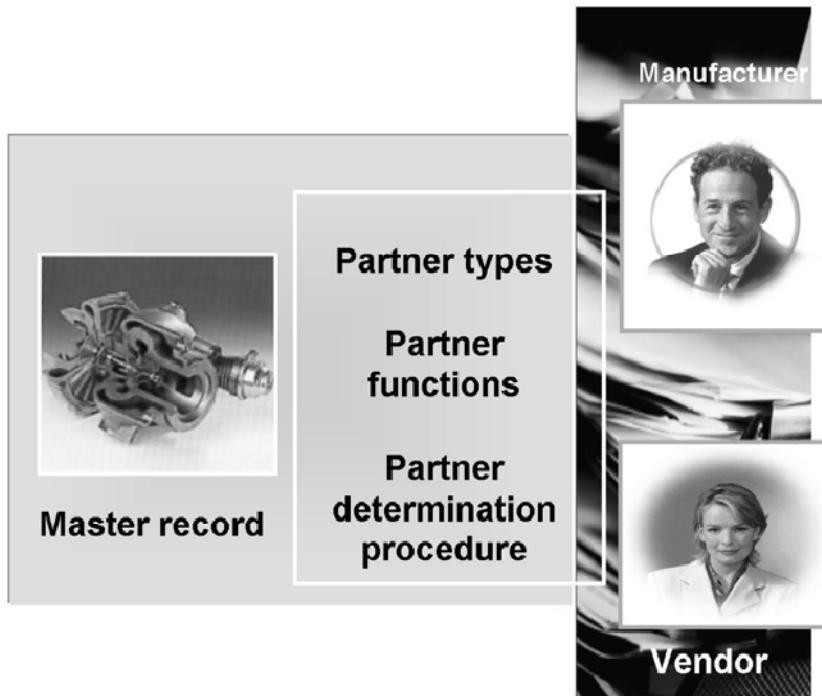


Figure 87: Partner Data for the Technical Object

Partners (business partners, contact persons) are internal or external organization units that could be involved in the development of maintenance or service measures.

Partner types

Personnel numbers, SAP users (internal)

Customers, vendors (external)

Partner functions

The different partner types can be subdivided according to partner functions. The partner function defines a partner's rights, obligations, responsibilities and tasks during the processing of a business transaction. In most cases, the partner fulfills predefined functions. This means that you only need one master record for this partner. In other cases, partner functions are divided up among different companies and their subsidiaries.

Partner determination procedure

The partner determination procedure is a grouping of partner functions that specifies whether partners are allowed for a particular object and which partner functions are possible for performing business transactions.

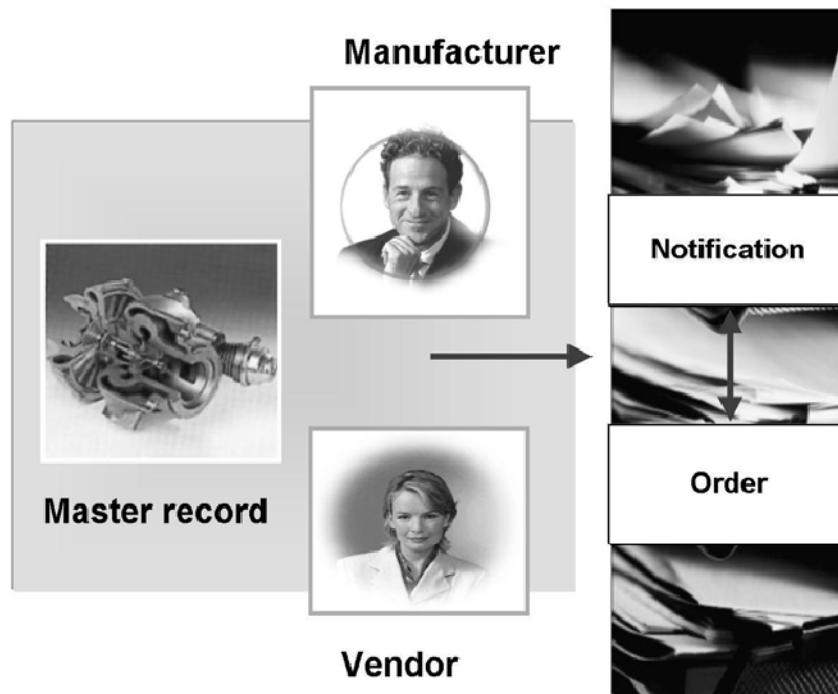


Figure 88: Partner Transfer

You can use this function to transfer not only the mandatory partner, but also additional partner data from the master record of a technical object when you are creating notifications or orders.

The partner function *Person responsible* can be maintained in the initial screen for notifications.

You can use non-standard partner types using customer exit ICSV0008. The partner types supported in the standard system are customer, vendor, contact person, personnel number, user, job and organizational unit.

Transfer of partner data to the serial number: During a delivery, partner data is automatically transferred from the delivery note to the serial number master record when goods issues are posted. The system copies the partner data from the SD document to the master record for the serial number. If partner data has already been specified in the master record for the serial number, this data is overwritten by the data from the SD document. However, the system only overwrites partner data for which an indicator has been set in Customizing.

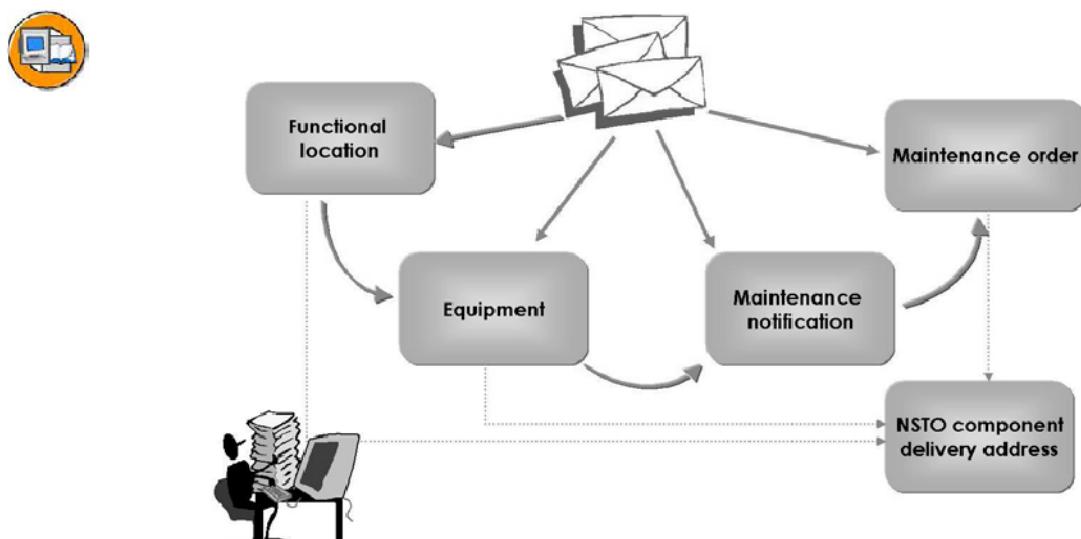


Figure 89: Central Address Management

The following objects are linked to the address management:

Functional location

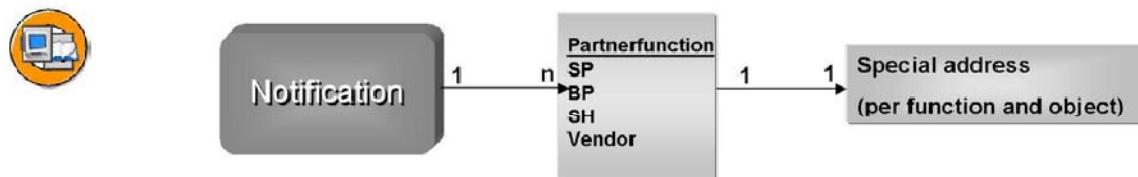
Equipment

Notification

Order

Components for non-stock material (order)

You can assign an address to all technical objects. The addresses of the technical objects, notification and order are synchronized.



- A notification or order can have several partners
- A special address can be created for partners of this object
- This special address is then only valid within the object.

Figure 90: Additional Address for each Partner Function

You can enter an additional address for each partner function in a notification or order. This address is then only valid for this notification or order. The data is not copied into the corresponding master record for the partner.

You can delete the address that you have entered. If you delete the partner, the address is deleted at the same time.

You can only delete the address of a one-time customer if you also delete the corresponding partner function.



- Partner determination procedure
- Partner functions

Figure 91: Customizing: Partner

You can define partner functions centrally for all Logistics applications and assign a certain partner type to each one. You can define partner determination procedures and configure each one with any number of partner functions. You can thereby define whether one of these functions should be changeable in the notification, and whether it is a mandatory function.

A group of partners (sold-to party, vendor and person responsible) belongs to each notification type and order type. You therefore assign a suitable partner determination procedure to each notification type and order type. You also assign the partner functions that appear in the notification or order header to each notification or order type, and provide a suitable short description for each one.

Certain partner types are set as default values in the system. For example, the following partner types are defined as defaults for notifications:

Customer (customer number)

Vendor (vendor number)

Person (personnel number)

System user (SAP user)

Contact person at customer company

Exercise 15: Partners and Addresses

Exercise Objectives

After completing this exercise, you will be able to:

- Use a partner determination procedure and the corresponding partner functions

Business Example

When performing maintenance tasks, it is essential that you can contact the responsible employee. The respective contact person, whether an internal person responsible, a vendor, or a manufacturer, should be stored within a partner determination procedure.

Task:

1. Display the partner determination procedure PM in Customizing.
Which functions have been defined?
2. Assign the partner determination procedure PM to the category of your piece of equipment TET-##.
How do you proceed?
3. Assign vendor 1000 as the responsible vendor and user PLM305-## as the responsible user to your piece of equipment TET-##.
How do you proceed?

Solution 15: Partners and Addresses

Task:

1. Display the partner determination procedure PM in Customizing.

Which functions have been defined?

- a) SAP menu → Tools → Customizing → IMG → Execute Project

Button SAP Reference IMG

Plant Maintenance and Customer Service → Master Data in Plant Maintenance and Customer → Basic Settings → Partners → Define Partner Determination Procedure and Partner Function

Select the *Plant Maintenance* area using the radio button

Taste *Change partner*, then select the row with procedure *PM* and double-click on folder *Functions in procedure*

Functions in partner procedure for PM

| Field Name or Data Type | Values |
|-------------------------|----------------------|
| AB | Department Respons. |
| SP | Sold-to party |
| Vendor | Vendor |
| MB | Notif. Process. |
| PC | Position Responsible |
| User Responsible | User Responsible |
| VW | Person Responsible |
| SH | Ship-to party |

2. Assign the partner determination procedure PM to the category of your piece of equipment TET-##.

Continued on next page

How do you proceed?

- a) *Plant Maintenance and Customer Service → Master Data in Plant Maintenance and Customer Service → Technical Objects → Equipment → Assign Partner Determination Procedure to Equipment Category*

In the row of the equipment category, enter the partner determination procedure PM and save.

3. Assign vendor 1000 as the responsible vendor and user PLM305-## as the responsible user to your piece of equipment TET-##.

How do you proceed?

- a) *SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Equipment → Change*

Goto → Partners

| Field Name or Data Type | Values |
|-------------------------|-------------------------|
| <i>Role</i> | Vendor |
| <i>Partner</i> | 1000 |
| <i>Role</i> | User Responsible |
| <i>Partner</i> | PLM305-## |



Lesson Summary

You should now be able to:

- Assign a partner to a technical object
- Use the address management

Lesson: Document Management

Lesson Overview

This lesson shows how to store documents in technical objects.



Lesson Objectives

After completing this lesson, you will be able to:

- Link a document master record with a technical object

Business Example

In the company, you want to link technical drawings with the respective technical objects.

Document Management

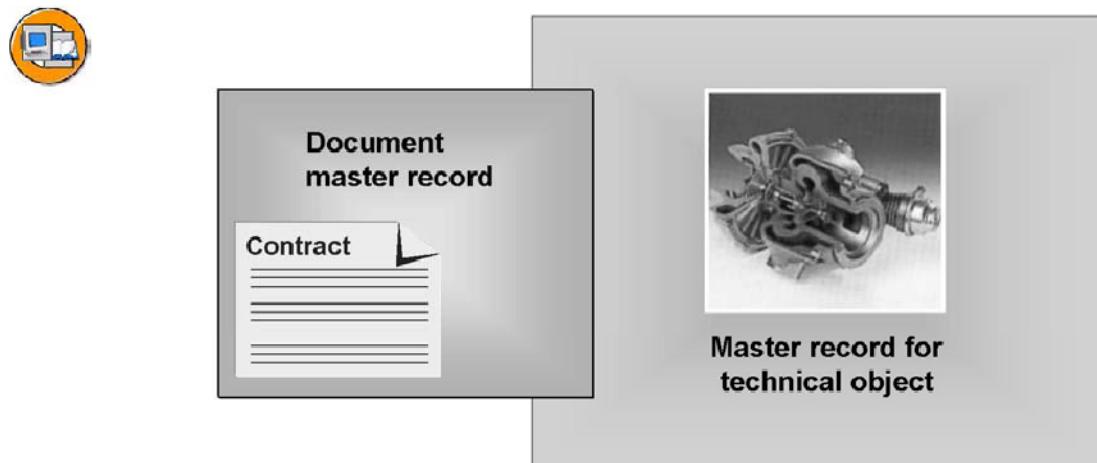


Figure 92: Document Assignment for Technical Object

Information about technical objects to be maintained can also exist in the form of documents (for example, construction drawings or photographs).

Documents are managed, visualized and archived as master records in the Document Management System. The Document Management System is one of the central functions in Logistics.

Since documents are often required when executing maintenance tasks, you can link the document master records directly to the master record of the technical object. Almost every type of document can be made available to technical objects using the display program (viewer).

Several documents can also be assigned to a master record for a technical object.



Lesson Summary

You should now be able to:

- Link a document master record with a technical object

Lesson: CAD Interface

Lesson Overview

This lesson shows the CAD interface from the viewpoint of technical objects.



Lesson Objectives

After completing this lesson, you will be able to:

- List the options of the CAD interface

Business Example

In the company, you want the CAD system to be the leading system in certain areas - the SAP System will be activated using a drawing object if necessary.

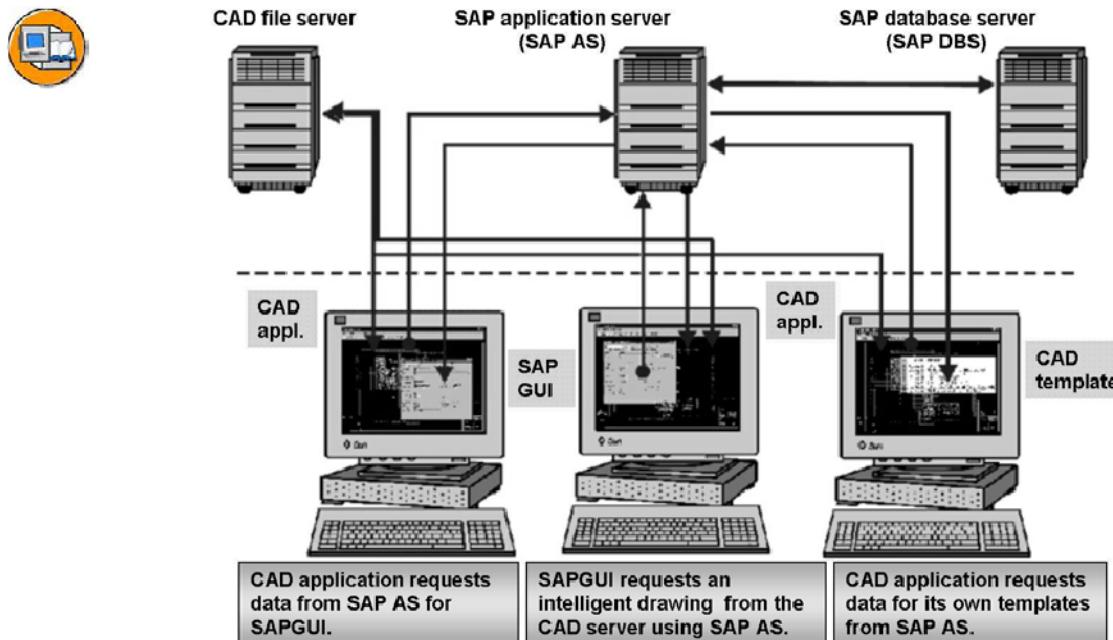


Figure 93: Communication between CAD and SAP System

The AutoCAD-SAP interface enables you to perform important processing functions from the PDM environment in either AutoCAD or the SAP System, and to transfer the relevant data between the two systems. The following prerequisites must be met for you to install and use the AutoCAD-SAP interface:

AutoCAD 14.01A, Mechanical Desktop 3.0

AutoCAD module "External database" (ASE)

At least SAPGUI Release 4.0A must be installed on the PC

Client 1: The user is in CAD, and wants to obtain linked data from the SAP System for a selected graphical object. To do this, they initiate a query to the SAP application server using a mouse-click and obtain the result on their SAPGUI screen.

Client 2: The user is in the SAPGUI, for example, on a screen for a certain functional location that represents a room. They would like to highlight this room in the corresponding drawing(s). The user requests the necessary drawing information from the SAP application server using a mouse-click from the SAPGUI. The CAD application ensures that the drawing is loaded and displayed as required (zooming, highlighting and so on).

Client 3: As in the first scenario, the user is in CAD, and wants to obtain linked data from the SAP System for a selected graphical object. To do this, they initiate a query to the SAP application server using a mouse-click and obtain the result on their CAD screen.

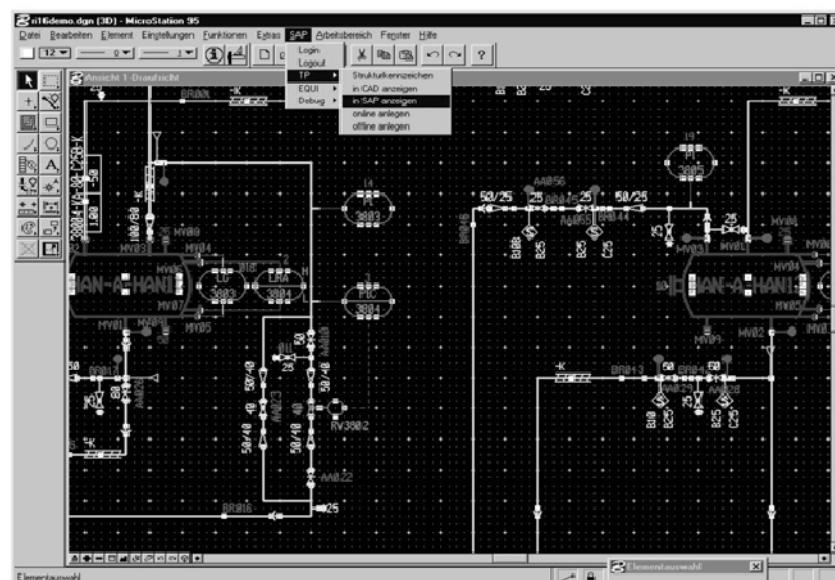


Figure 94: Pipe and instrument (R&I) drawing with access to SAP master data

The partner solution shows how you only need process objects once in order to display them in an R&I CAD drawing and in the SAP System application component. The CAD objects are called up in the SAP PM component from the R&I as pieces of equipment or functional locations.

Creating pieces of equipment and functional locations: Functional locations should be created for different apparatus and containers in an R&I. The description of each of these objects is available as a text object in the drawing. These text objects are first selected. A batch input session is then created from the selection. This contains the text objects, which are interpreted as functional locations, and other mandatory fields that have been assigned default values. The default values are set once before the drawing(s) is/are called up, and can be changed at any time, if required. An implicit log-on takes place in the sample configuration, that is, the log-on data is already available for the CAD, which means that data does not have to be entered explicitly. SAP confirms receipt of the batch input session after log-on. An authorized user must run through this session to ensure that the data is available in the SAP System.



Lesson Summary

You should now be able to:

- List the options of the CAD interface

Lesson: Status Management

Lesson Overview

This lesson shows how to set up user statuses along with the existing system status management.



Lesson Objectives

After completing this lesson, you will be able to:

- Define a status profile
- Assign and use a status profile

Business Example

In the company, you want to control technical objects and their business processes using an additional usable user status profile that enhances the respective system status.

Thus, for example, you can use a user status to document and control the scrapping of objects.

Status Management

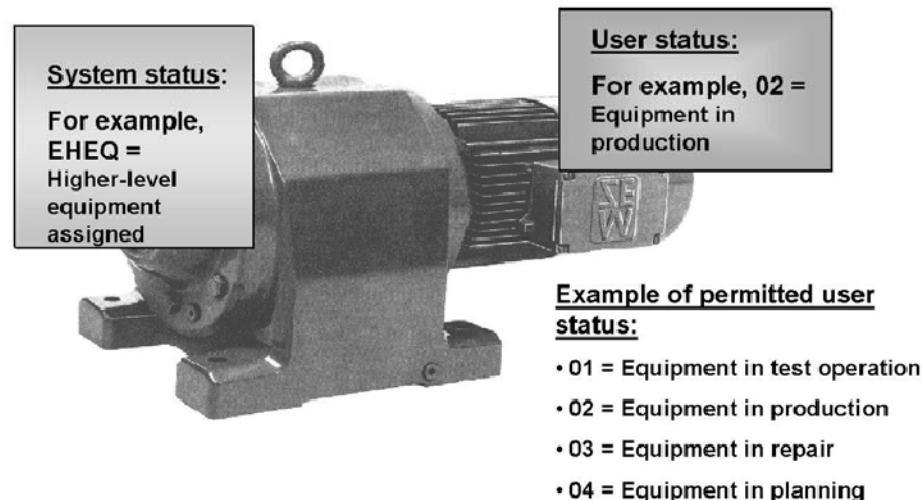


Figure 95: System Status and User Status

You can use status management to describe and ascertain whether or not a technical object is available for particular operations. There are two different types of status:

System status

User status

System statuses are set internally by the system for particular business transactions within general status management. They inform you whether a particular business transaction has been performed at a technical object, and which business transactions you may now perform for the technical object based on this status.

Since the system statuses cannot be changed directly by the user and are set automatically by the system when you perform particular business transactions, you are only able to display them.

User statuses are defined by the system user within a status profile. You can use a status profile to limit the business transactions allowed for the respective system statuses.

You can assign and delete user statuses defined in Customizing if you have the appropriate authorization for this.



System status:

For example,
EHEQ =
Higher-level
equipment
assigned



User status:

For example, 02 =
Equipment in
production

Business operations allowed:

For example: "Building equipment hierarchy"
"Breaking down equipment hierarchy"
"Entering maintenance processing data"

Business operations prohibited:

For example: "Dismantling equipment"
"Installing equipment"
"Delivery to the customer"

Figure 96: Business Operations

The business processes allowed or prohibited are controlled by the system status and user status. You can use an operation analysis to find out why a particular operation is allowed or prohibited.



- **Status profile for user status**
- **Assignment of status profile**

Figure 97: Customizing Settings for the Status Management

In the status profile

- You define your own statuses (user statuses) and document their function in a relevant long text
- You define the status numbers for the user status which predefine the possible sequence of user statuses
- You define an initial status which is automatically activated when an object is created
- You define which user status is automatically activated when a business management operation is performed
- You define which operations are allowed and which are not when a particular status is active

The status profile is assigned to the equipment or functional location in Customizing.

Each status profile contains one or more permissible statuses. For each of these statuses, you can define the system behavior within the business operations defined by SAP.

You can define a status number for each user status. The status number helps to determine the sequence in which the user statuses can be activated. If you do not assign a status number to a user status, you are always able to set this user status. However, only one user status with a status number may be active at any one time.

Exercise 16: Status Management

Exercise Objectives

After completing this exercise, you will be able to:

- Create and use a user status determination procedure

Business Example

Certain conditions of an object, such as the condition *to be scrapped*, cannot be displayed using a system status.

Here a separate user status profile is created in the company to provide this status.

Task:

1. Display the partner determination procedure PMSTAT in Customizing.
Which statuses are maintained?
How is the status control regulated?
Which business management operations are still allowed for the status *scrapped*?
2. Assign the status profile PMSTAT to the category of your piece of equipment.
How do you proceed?
3. Perform scrapping for your piece of equipment. Set the user status Scrapped.
How do you proceed?

Solution 16: Status Management

Task:

1. Display the partner determination procedure PMSTAT in Customizing.

Which statuses are maintained?

How is the status control regulated?

Which business management operations are still allowed for the status *scrapped*?

a) *SAP menu → Tools → Customizing → IMG → Execute Project*

Button "SAP Reference IMG"

Plant Maintenance and Customer Service → Master Data in Plant Maintenance and Customer Service → Basic Settings → Define User Status

Position the cursor in the row PMSTAT, and go to "Details"

| Field Name or Data Type | Values |
|-------------------------|--------------------------------------|
| UMW | Equipment environmentally friendly |
| PLA | Equipment in planning |
| TST | Equipment in test operation |
| PRD | Equipment in production |
| REP | Equipment in repair |
| DEF | Equipment defective in the warehouse |
| VRS | Equipment scrapped |

Controlling the status:

With the exception of the status UMW, all statuses have a **status number**. This means that the statuses mutually exclude one another, that is, only one status can be set at any one time. The status UMW can also be set in addition to the normal status.

Continued on next page

The **lowest status numbers** are configured in such a way that you cannot switch back to PLA from TST, or from PRD, REP, DEF, VERS to TST. You can switch between PRD, REP, DEF and VERS as you wish.

The **highest status number** is configured in such a way for PLA, for example, that you can only switch upwards to TST.

Allowed business management operations for status VRS

> In the status profile > click twice on the field VRS in the column Status

| Field Name or Data Type | Values |
|-------------------------|--|
| Status VRS (scrapped) | Set deletion indicator Mark for deletion Remove deletion flag Change technical object |

2. Assign the status profile PMSTAT to the category of your piece of equipment.

How do you proceed?

- a) *Plant Maintenance and Customer Service → Master Data in Plant Maintenance and Customer Service → Technical Objects → Equipment → Assign User Status Profile to Equipment Category*

3. Perform scrapping for your piece of equipment. Set the user status Scrapped. How do you proceed?

- a) *SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Equipment → Change*

Press the i button in the row showing the system status

> An overview of the system status is shown in the left column, and the user status in the right

> In the area *Status with status no.*, activate status **6 (VRS = scrapped)**, press F3 and save



Lesson Summary

You should now be able to:

- Define a status profile
- Assign and use a status profile

Lesson: Warranties

Lesson Overview

This lesson shows how to make warranty information available from the technical object.



Lesson Objectives

After completing this lesson, you will be able to:

- Assign a warranty to a technical object
- Use the warranty in the notification and order

Business Example

When malfunction reports are being created for a machine, the information on any vendor warranties should be displayed automatically.

Warranties

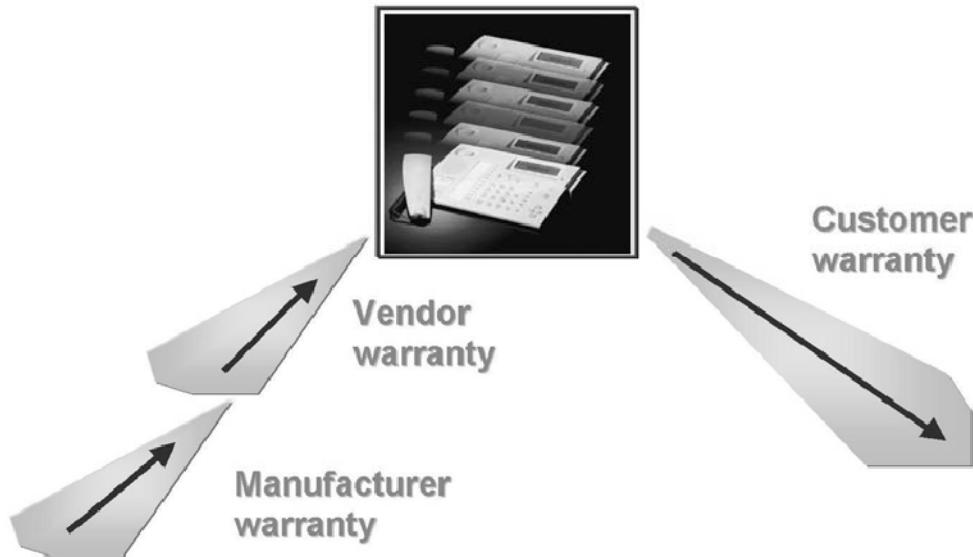


Figure 98: Warranty Types

A warranty is a binding commitment to the customer to provide services, partly or fully without cost, for a specified period of time, or for the specific life of an individual device.

Before you create a warranty record, you must define how the warranty should be used. For this, you need the warranty type. The warranty type is assigned to an internal warranty category that specifies whether the company for which the system user works is a warrantee or guarantor.

In the SAP System, a distinction is made between the following warranty types from the view of the system user:

Manufacturer warranty Warrantee (inbound)

Vendor warranty Warrantee (inbound)

Customer warranty Guarantor (outbound)

A series of standard table entries are already provided in the R/3 System. In Customizing, you can define the different warranty types that are still needed in your company, and assign each warranty type to one of the two warranty categories. If you create a warranty record as a system user, you must use one of the existing warranty types.

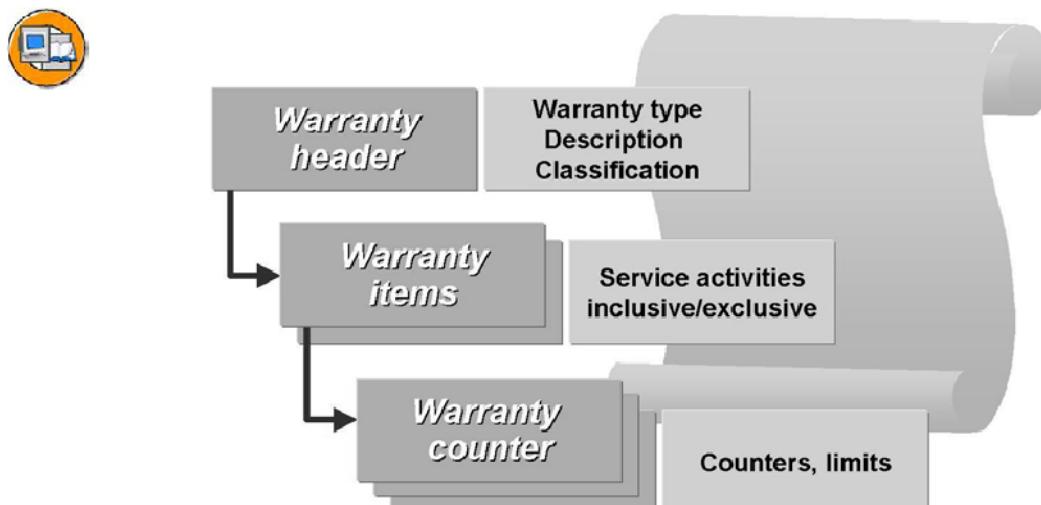


Figure 99: Structure of the Master Warranty

Warranties are initially created as master warranties, independently of the reference object.

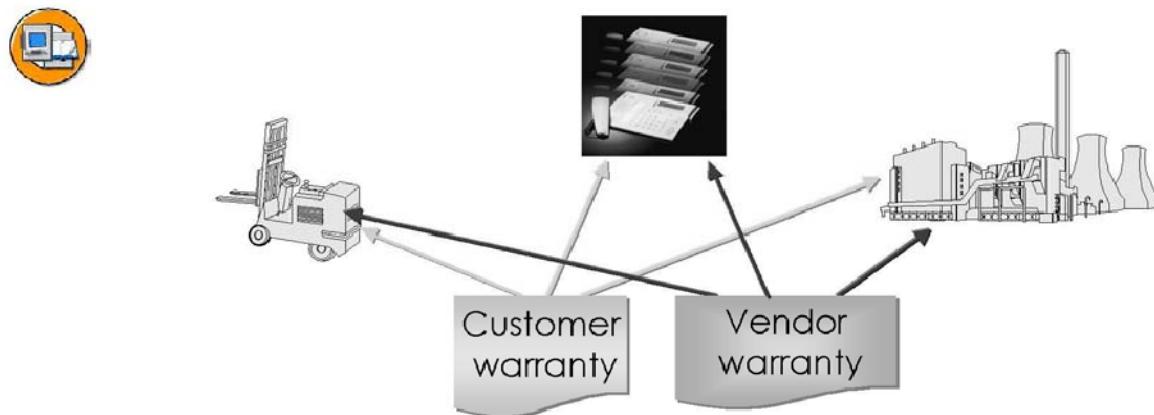
A master warranty is structured as follows:

The warranty header contains the warranty type, descriptive text and option of classification.

The warranty items contain the services that are included or not included in the warranty. The services can be described using a text, service number or material number. Configurable services can be assigned values in the warranty.

Warranty counters can be defined for each warranty item. These are validity criteria that are defined as a period of time or a performance counter. The warranty counters can either be linked using an AND link (both of the conditions must be met) or an OR link (one of the conditions must be met).

A master warranty can be assigned to any number of pieces of equipment.



- **Warranties also now available for functional locations and serial numbers**
- **Two warranty types per object (customer warranty, vendor warranty)**

Figure 100: Warranties

Previously, you could only assign the warranty to pieces of equipment. As of Release 4.6, you can also assign warranties to functional locations and serial numbers.

The system supports two warranty types per object. You can now assign a customer warranty and vendor warranty to each object. In the event of damage, both warranties will be checked.



- **Warranty category**
- **Warranty type**

Figure 101: Customizing Settings for Warranties

In Customizing, you can configure that a dialog box should automatically be displayed if the check result for a warranty check in a notification or order is positive (that is, the warranty is still valid).

Each warranty type is assigned to a warranty category in the system. There are two warranty categories in the SAP System that specify the user view of the warranty. The warranty categories are strictly defined within the system and cannot be modified. There are two types of warranty category:

Warantee: The warranty comes from an outside party, for example, from a vendor or manufacturer. The observer is the warantee.

Guarantor: The warranty is internal and goes to the customer. The observer is the guarantor.

The warranty category is set internally in the SAP System and cannot be changed to meet specific company requirements. The following warranty categories are available in the standard SAP System:

Warranty category I

This warranty category is available if you are the warantee.

Warranty category O

This warranty category is available if you are the guarantor.



- **BG000001:**
Pre-assignment of warranty data in the technical object
- **BG000002:**
Changing the dialog box during the warranty check
- **BG000003:**
Changing the check result



Figure 102: Customer Exits

BG000001 You can define the default values for warranty data in the technical object using this customer exit. For example, you can define that when warranty data is entered, the following values should be assigned by default:

Warranty start: Current date

Warranty end: After one year

BG000002 You can change the check dialog box using this customer exit, that is, you can either display additional fields, or alternatively, hide fields (for example, display of the master warranty number)

BG000003 You can change the check results using this customer exit. In this way, for example, you can incorporate tolerances into the warranty check.

Exercise 17: Warranties

Exercise Objectives

After completing this exercise, you will be able to:

- Create and assign master warranties

Business Example

A warranty is granted for the technical objects sold. This warranty covers certain services in a warranty period.

Task:

1. Creating a Master Warranty

Create a master warranty.

Text: 1 year for all delivered items

Warranty type: Customer warranty

Text for the first service item: **All spare parts, no installation**

Enter the warranty counter **WARRANTY_TIME** and the counter value **1 year**.

Save the master warranty.

Which number is assigned?

2. Assigning a Master Warranty to the Equipment

Assign the newly created master warranty to your equipment T-CSE2## as a customer warranty.

The warranty is valid from the first day of the current month.

The warranty should be passed on to subordinate objects. Warranties from the superior object should not be inherited.

Save the changes.

Solution 17: Warranties

Task:

1. Creating a Master Warranty

Create a master warranty.

Text: 1 year for all delivered items

Warranty type: Customer warranty

Text for the first service item: All spare parts, no installation

Enter the warranty counter WARRANTY_TIME and the counter value 1 year.

Save the master warranty.

Which number is assigned?

- a) SAP menu → Logistics → Customer Service → Service Agreements → Warranties → Master Warranty → Create

Enter

| Field Name or Data Type | Value |
|-------------------------|----------------------------------|
| Master warranty – text | 1 year for all delivered items |
| Warranty type | Customer warranty |
| Services – text | All spare parts, no installation |

Mark the service item and select the Counter tab page.

Counter

| Field Name or Data Type | Value |
|-------------------------|---------------|
| Warranty counter | WARRANTY_TIME |
| Warranty counter value | 1 year |

Save

Number of the master warranty: see system notification.

Continued on next page

2. Assigning a Master Warranty to the Equipment

Assign the newly created master warranty to your equipment T-CSE2## as a customer warranty.

The warranty is valid from the first day of the current month.

The warranty should be passed on to subordinate objects. Warranties from the superior object should not be inherited.

Save the changes.

- a) *SAP menu → Logistics → Customer Service → Management of Technical Objects → Equipment → Change*

| Field Name or Data Type | Value |
|-------------------------|----------|
| <i>Equipment</i> | T-CSE2## |

Enter

Customer warranty area

| Field Name or Data Type | Value |
|--|------------------------------------|
| <i>Customer warranty – begin guarantee</i> | <i>First day of current month</i> |
| <i>Master warranty</i> | <i>Your master warranty number</i> |

Delete the *Inherit warranty* indicator and choose *Save*.



Lesson Summary

You should now be able to:

- Assign a warranty to a technical object
- Use the warranty in the notification and order

Lesson: Data Transfer

Lesson Overview

This lesson provides a brief overview of the data transfer from the old system to the SAP System.



Lesson Objectives

After completing this lesson, you will be able to:

- Describe the IBIP transaction

Business Example

In the company, you want to make data from the old system available in the SAP System as easily as possible.

Data Transfer

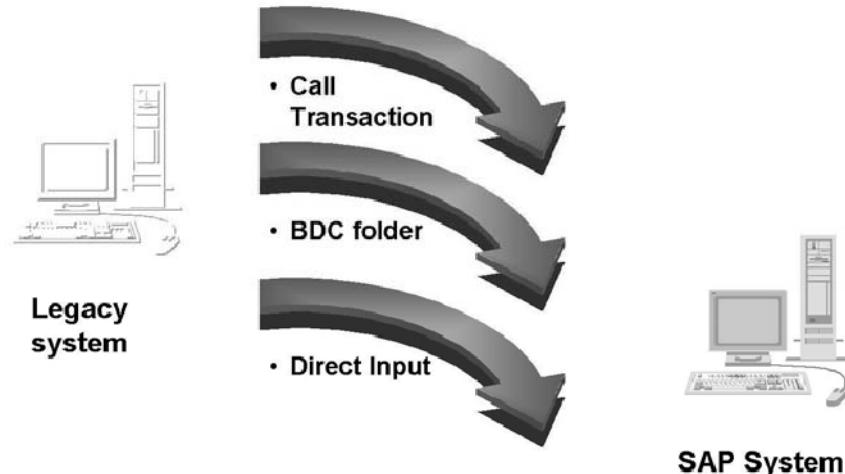


Figure 103: Data Transfer to the SAP System

First, you create the source data. You must create this either using external tools or the functions for data maintenance.

You then define an execution mode. For this, you have the following options:

'Call transaction' starts the application transaction for performing data transfer immediately.

'BDC folder' (indirect) first creates a folder. You must then process this folder using transaction SM35 to transfer the data.

'Direct input' creates the required object directly using function modules. You do not usually receive an online message. Error-free data is written directly from the function module to the database.

You then define the source and target file. This includes the path of your file and the data origin. If you want to save incorrect transactions, you must specify a target file.

Finally, execute the transaction IBIP.



Lesson Summary

You should now be able to:

- Describe the IBIP transaction

Lesson: Object Networks

Lesson Overview

This lesson shows how to represent horizontal structures (such as line networks).



Lesson Objectives

After completing this lesson, you will be able to:

- Briefly describe the functionality of object networks

Business Example

In the company, you want to use an object network to represent the pipeline networks between different water pumps.

Object Networks

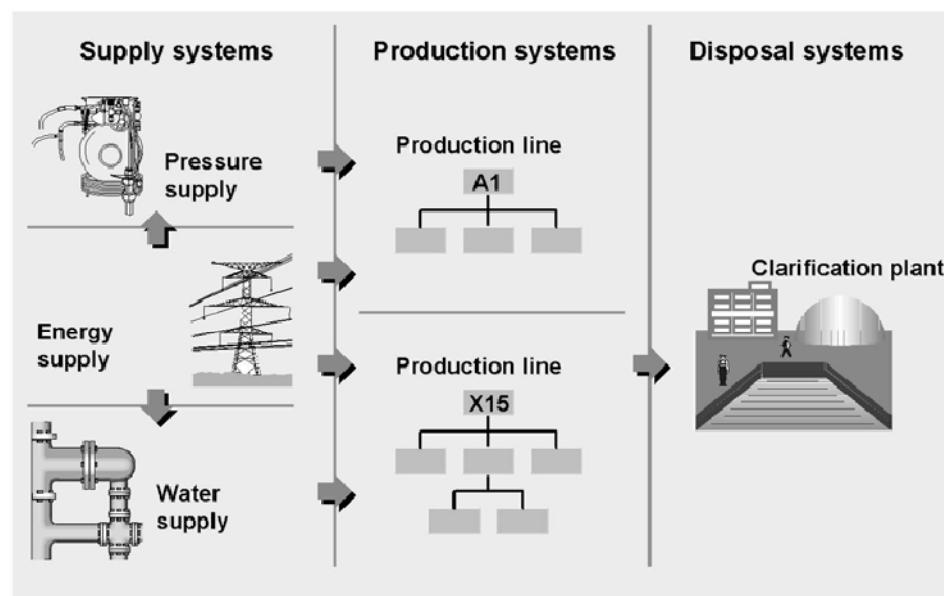


Figure 104: Networking Technical Objects

You can display the dependencies between particular technical objects (equipment, functional locations) using object links. Knowledge of these dependencies is particularly important for companies supplying electricity, gas or water, and for

the chemical industry. However, the administration of object links also has many advantages for companies with many related production lines or for computer network operators.

You can represent links between the following objects:

From one functional location to another

From one piece of equipment to another

You cannot generate links between different object categories, for example, between a piece of equipment and a functional location.

The linking object (for example, pipeline or cable) can be managed as a functional location or piece of equipment, but this is not absolutely necessary.

The link between two technical objects is usually identified by the link number. So it is sufficient for you to specify that technical object A is linked to technical object B.

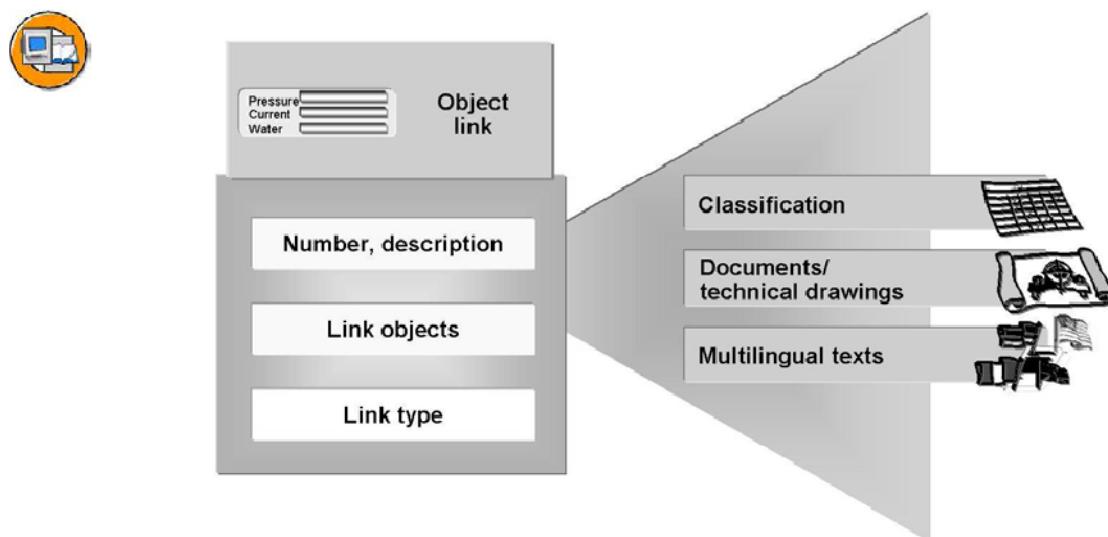


Figure 105: Master Record for Object Link

All essential data for the object link is located in the object link master record on one screen. This screen is constructed in the same way for both functional location and equipment links. The screen consists of three data blocks:

Object link data: Here you can find the number and description of the link and identification of the network to which the link belongs.

Data for linked objects and objects to be linked: Here you can find the numbers and descriptions of the objects that are linked with one another (= nodes) and the number and description of the object that the link represents.

Data for type of link: Here you can find information about the validity of the link, medium forwarded and type of relationship between the linked objects.

You can enter the following information for each object link:

Data for classification of object link

Data for documents from the Document Management System (DMS)

Multilingual texts

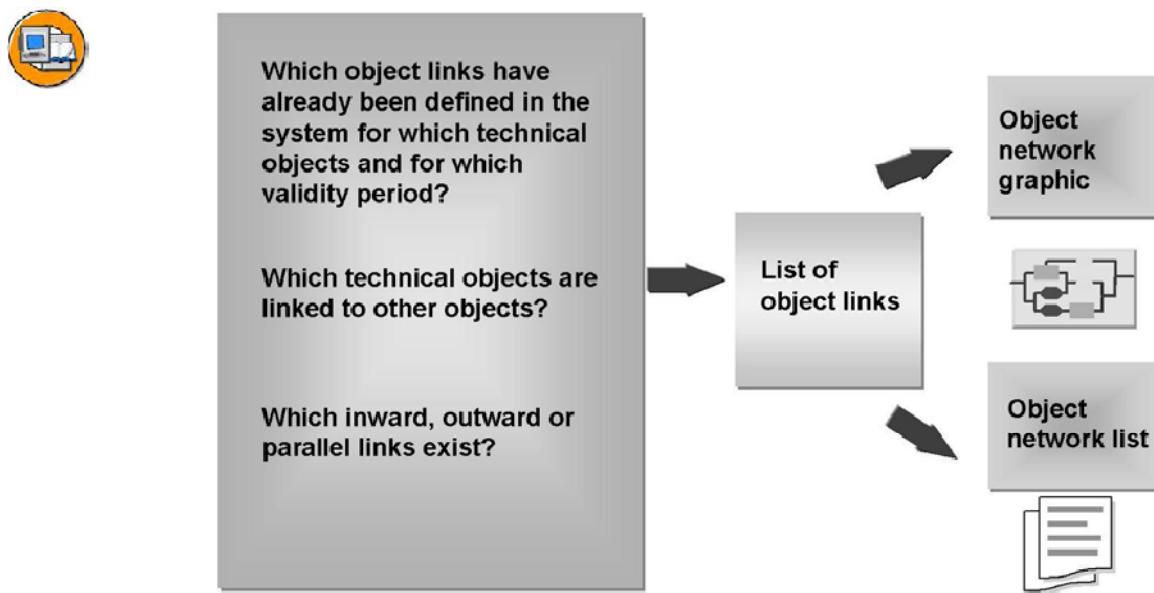


Figure 106: Evaluation of Object Links

The object links you want to evaluate must be saved in master records in the system. To perform an evaluation, you must have authorization to display or change object links.

The basis for the evaluation of object links and networks is always a list of object links that you create using the selection function.

If you only want to see a list with particular object links, it is sufficient to create this list using the selection function.

Use the special analysis and graphical functions from the list to perform more complex evaluations of object links.

Depending on the analysis option you have selected, you obtain either an alphanumerically arranged list or a graphic with the objects, or alternatively, the system displays the object network in a particular form.



- The object network can be supplemented by a GIS.
- You can branch to a GIS from the R/3 System and display the exact geographical location of a technical object.
- A GIS can also represent network dependencies.



Figure 107: Object Network Graphic and Geographical Information Systems (GIS)

A Geographical Information System (GIS) enables you to manage technical objects with a geographical reference, such as services, railways, roads, buildings or industrial sites.

You can use a GIS to identify the technical object, plan journeys and maintenance routes, and perform area-related evaluations.

The maintenance functions in R/3 possible with CAD/GIS (for example, Map&Guide or AutoCAD) are listed below:

- Creating, changing and displaying equipment
- Searching for equipment and functional location using matchcodes
- Displaying equipment and functional location structure
- Installing and dismantling equipment at a functional location
- Displaying installed equipment at a functional location
- Creating a malfunction report



Lesson Summary

You should now be able to:

- Briefly describe the functionality of object networks

Lesson: Archiving

Lesson Overview

This lesson provides a brief overview of the archiving of business objects in Plant Maintenance.



Lesson Objectives

After completing this lesson, you will be able to:

- Describe the archiving process

Business Example

In the company, you want to archive transaction data that is older than ten years.

Archiving

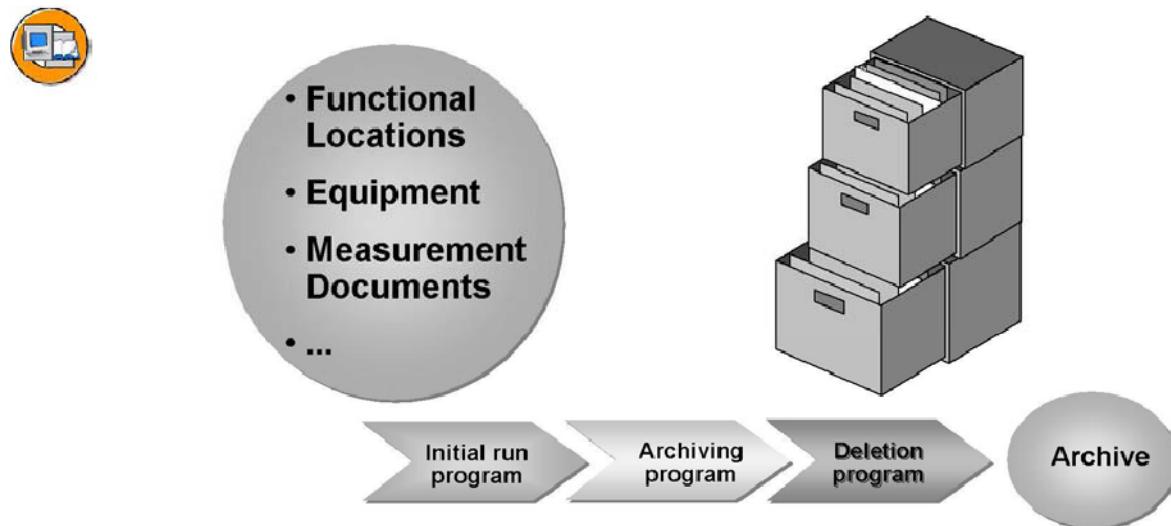


Figure 108: Archiving

You can use the archiving program to archive master data for pieces of equipment, functional locations, and measurement documents that no longer need to be accessed directly. The data is written to archive files and then deleted from the system if the operation was successful.

The **archiving object** defines what should be archived and how. The archiving object describes which data objects have to be bundled to obtain a business-completed object - this object can then be dealt with irrespective of technical conditions at the time of archiving. The following archiving objects are available:

- PM_EQUI – pieces of equipment
- PM_IFLOT – functional locations
- PM_OBJLIST – serial number history
- PM_IMRG – measurement documents
- PM_QMEL – maintenance notifications
- PM_ORDER – maintenance and service orders
- PM_PLAN – maintenance task lists
- PM_MPLAN – maintenance plans

The initial run program prepares the data in the database for archiving.

The archiving program writes the relevant database tables for the equipment to the archive.

The deletion program deletes all the database records for equipment that was successfully archived.

You can find further information in the online help at *Cross-Application Components*.



Lesson Summary

You should now be able to:

- Describe the archiving process



Unit Summary

You should now be able to:

- List the available object services
- Assign a partner to a technical object
- Use the address management
- Link a document master record with a technical object
- List the options of the CAD interface
- Define a status profile
- Assign and use a status profile
- Assign a warranty to a technical object
- Use the warranty in the notification and order
- Describe the IBIP transaction
- Briefly describe the functionality of object networks
- Describe the archiving process



Course Summary

You should now be able to:

- Create and structure functional locations
- Apply equipment
- Apply bills of material and assemblies
- Apply serial numbers
- Apply structuring examples from customer projects
- Apply classification and configuration
- Apply measuring points and counters
- Apply additional functions (such as partner, user status, guarantees)

Appendix 1

Model Solution for Practical Example



Model solution



Figure 109: Model Solution for Practical Example

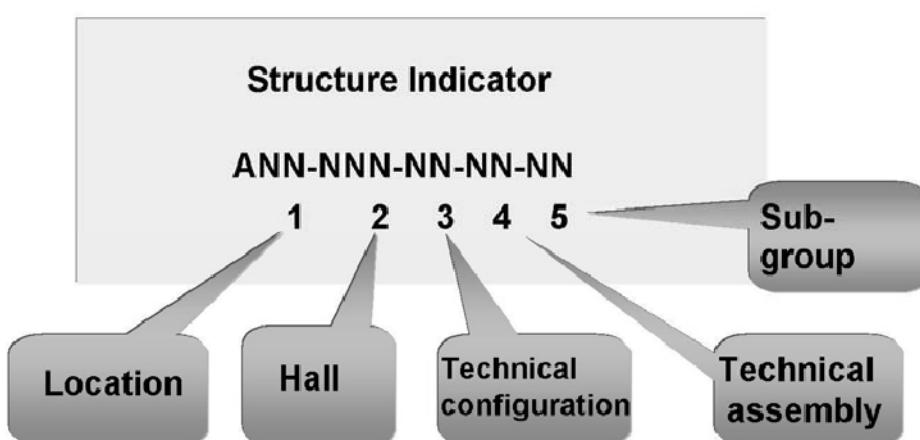


Figure 110: Structure Indicator

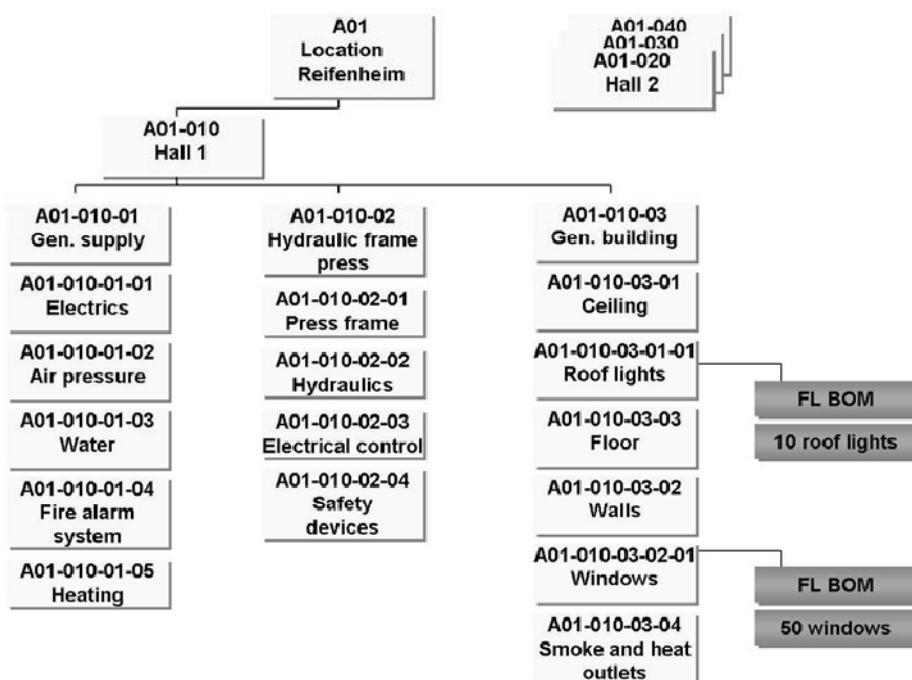


Figure 111: Model Structure (1)

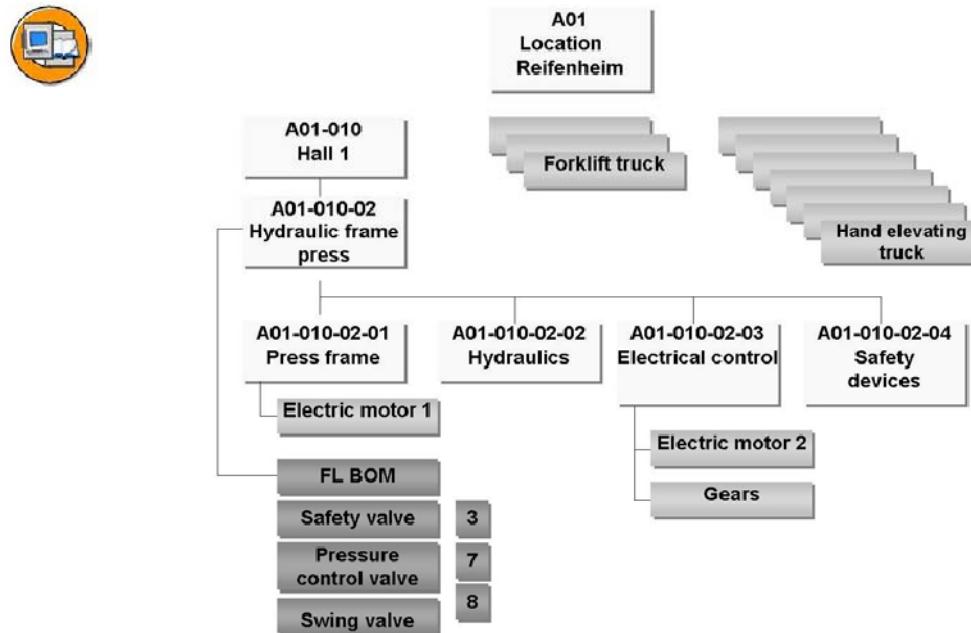


Figure 112: Model Structure (2)

Appendix 2

Customizing Paths for Technical Objects

Accessing Customizing:

SAP Menu → Tools → Customizing → IMG → Execute Project

Button *SAP Reference IMG*

Functional Locations

| Field Name or Data Type | Path |
|------------------------------|--|
| Structure indicator | <i>Plant Maintenance and Customer Service → Master Data in Plant Maintenance and Customer Service → Technical Objects → Functional Locations → Create Structure Indicator for Reference Locations/Functional Locations</i> |
| Functional location category | <i>Plant Maintenance and Customer Service → Master Data in Plant Maintenance and Customer Service → Technical Objects → Functional Locations → Define Category of Functional Location</i> |
| List editing | <i>Plant Maintenance and Customer Service → Master Data in Plant Maintenance and Customer Service → Technical Objects → Functional Locations → Set List Editing for Reference Functional Locations</i> |

| Field Name or Data Type | Path |
|-------------------------|--|
| | <i>Set List Editing for Functional Locations</i> |
| Alternative labeling | <i>Plant Maintenance and Customer Service → Master Data in Plant Maintenance and Customer Service → Technical Objects → Functional Locations → Alternative Labeling for Functional Locations</i> |
| Profile | <i>Plant Maintenance and Customer Service Master Data in Plant Maintenance and Customer Service Technical Objects General Data Set View Profiles for Technical Objects</i> |

Equipment

| Field Name or Data Type | Path |
|--|--|
| Automatic creation of technical system/equipment | <i>Financial Accounting Asset Accounting Master Data Automatic Creation of Equipment Master Records</i> |
| Equipment category | <i>Plant Maintenance and Customer Service Master Data in Plant Maintenance and Customer Service Technical Objects Equipment Equipment Categories Maintain Equipment Category</i> |
| Number range | <i>Plant Maintenance and Customer Service Master Data in Plant Maintenance and Customer Service Technical Objects Equipment Equipment Categories Maintain Equipment Category</i> |
| Business views | <i>Plant Maintenance and Customer Service Master Data in Plant Maintenance and Customer Service Technical Objects Equipment Equipment Categories Maintain Equipment Category</i> |
| Profile | <i>Plant Maintenance and Customer Service Master Data in Plant Maintenance and Customer Service Technical Objects General Data Set View Profiles for Technical Objects</i> |
| Usage history | <i>Plant Maintenance and Customer Service Master Data in Plant Maintenance and Customer Service Technical Objects Equipment Equipment Categories Maintain Equipment Category</i> |

| Field Name or Data Type | Path |
|---|--|
| Object type | <i>Plant Maintenance and Customer Service Master Data in Plant Maintenance and Customer Service Technical Objects General Data Set View Profiles for Technical Objects</i> |
| Installation at functional location | <i>Plant Maintenance and Customer Service Master Data in Plant Maintenance and Customer Service Technical Objects Equipment Equipment Categories Maintain Equipment Category</i> |
| Field selection for equipment master record | <i>Plant Maintenance and Customer Service Master Data in Plant Maintenance and Customer Service Technical Objects Equipment Equipment Categories Maintain Equipment Category</i> |

Bills of Material

| Field Name or Data Type | Path |
|-------------------------|--|
| BOM usage | <i>Plant Maintenance and Customer Service Master Data in Plant Maintenance and Customer Service Bills of Material General Data BOM Usage Define BOM Usages</i> |
| Item category | <i>Plant Maintenance and Customer Service Master Data in Plant Maintenance and Customer Service Bills of Material Item Data Define Item Categories</i> |

Serial Numbers

| Field Name or Data Type | Path |
|---|--|
| Serial number profile | <i>Plant Maintenance and Customer Service Master Data in Plant Maintenance and Customer Service Technical Objects Equipment Equipment Categories Maintain Equipment Category</i> |
| Serialization operations and movement types | <i>Plant Maintenance and Customer Service Master Data in Plant Maintenance and Customer Service Technical Objects Equipment Equipment Categories Maintain Equipment Category</i> |

Measuring Points and Counters

| Field Name or Data Type | Path |
|--------------------------|---|
| Measuring point category | <i>Plant Maintenance and Customer Service Master Data in Plant Maintenance and Customer Service Basic Settings Measuring Points, Counters and Measurement Documents Define Measuring Point Categories</i> |

Additional Functions

| Field Name or Data Type | Path |
|---------------------------------|---|
| Partner determination procedure | <i>Plant Maintenance and Customer Service Master Data in Plant Maintenance and Customer Service Bills of Material Item Data Define Item Categories</i> |
| Partner functions | <i>Plant Maintenance and Customer Service Master Data in Plant Maintenance and Customer Service Bills of Material Item Data Define Item Categories</i> |
| Define user status profile | <i>Plant Maintenance and Customer Service Master Data in Plant Maintenance and Customer Service Basic Settings Maintain User Status</i> |
| Assign user status profile | <p>For functional locations:</p> <p><i>Plant Maintenance and Customer Service → Master Data in Plant Maintenance and Customer Service → Technical Objects → Functional Locations → Define Category of Functional Location</i></p> <p>For equipment:</p> <p><i>Plant Maintenance and Customer Service Master Data in Plant Maintenance and Customer Service Technical Objects Equipment Equipment Categories Maintain Equipment Category</i></p> |
| Warranty category | <i>Plant Maintenance and Customer Service Master Data in Plant Maintenance and Customer Service Bills of Material Item Data Define Item Categories</i> |

| Field Name or Data Type | Path |
|--|--|
| Warranty type | <i>Plant Maintenance and Customer Service Master Data in Plant Maintenance and Customer Service Bills of Material Item Data Define Item Categories</i> |
| Object type (object networks) | <i>Plant Maintenance and Customer Service Master Data in Plant Maintenance and Customer Service Technical Objects Equipment Equipment Categories Maintain Equipment Category</i> |
| Media for object links (object networks) | <i>Plant Maintenance and Customer Service Master Data in Plant Maintenance and Customer Service Technical Objects Equipment Equipment Categories Maintain Equipment Category</i> |

Feedback

SAP AG has made every effort in the preparation of this course to ensure the accuracy and completeness of the materials. If you have any corrections or suggestions for improvement, please record them in the appropriate place in the course evaluation.