

PLANT MAINTENANCE MODULE (PM)

Master Data – Equipment

In SAP, a technical object is a component in a **structured** technical system on which a maintenance task is performed and assets need to be maintained. Either a part of the total technical system or a physical object that is maintained as autonomous units like individual equipment can be defined as technical objects. Technical objects are classified as **“Functional Locations”** and **“Equipment”**.

A **“Functional Location” (FL)** is an organizational unit that structures the maintenance objects according to functional, process oriented, or spatial criteria. The FL represents the place at which a maintenance task is performed.

An **equipment** is known as an individual object in the system that is maintained independently. **Equipment** can be installed at different functional locations.

In SAP PM Module of AP Transco, all the **Zones, Circles, Divisions, Subdivisions, Substations, Substation bays** and **Transmission lines** are defined as functional locations. The various **Sub Station equipment** and **transmission towers** are defined as Equipment. All the **functional locations** are attached to each other in a structural fashion according to the functional hierarchy. The **equipment** technical objects are assigned to the bottom most functional location in the structure i.e **Sub Station bay/EHT Lines**.

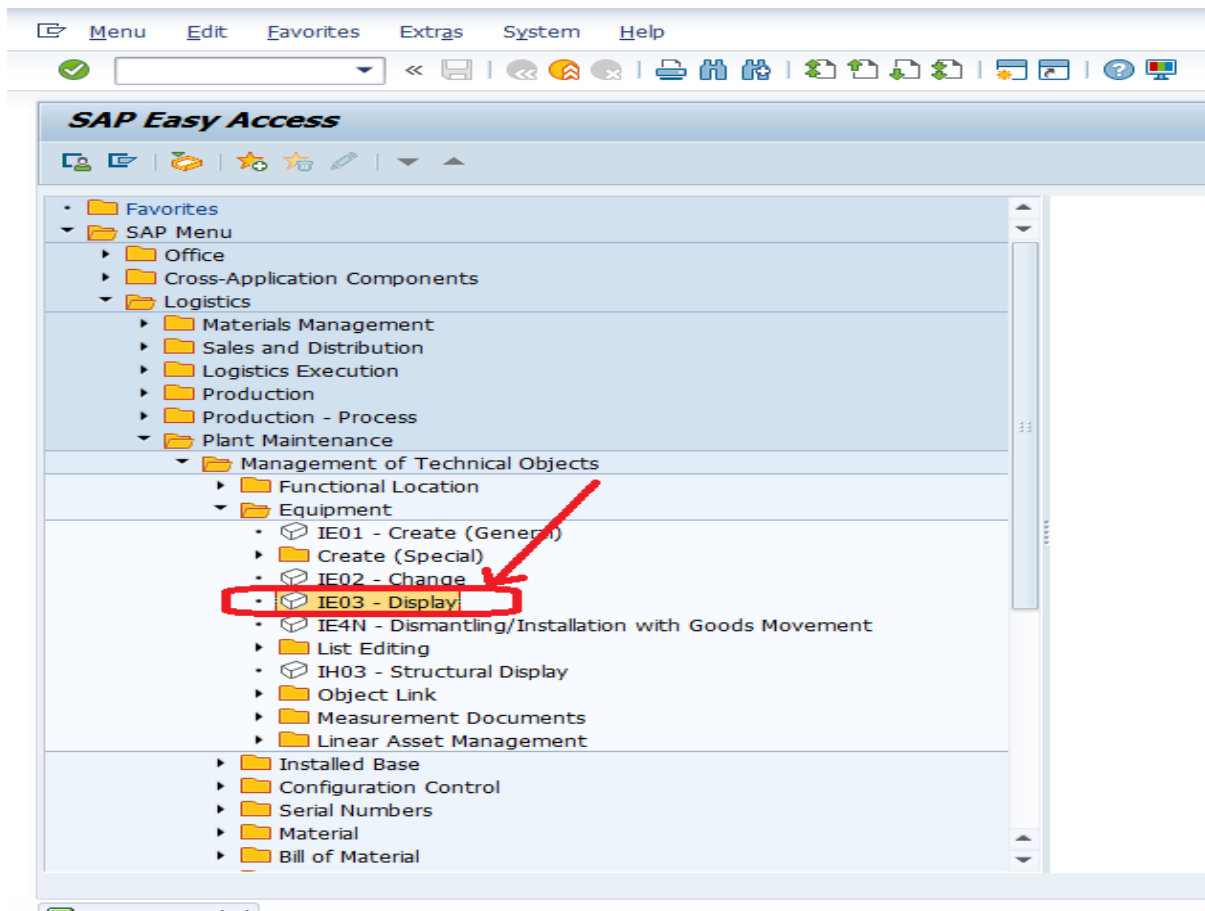
Each functional location and equipment would be assigned a **unique ID**. The ID in respect of equipment is automatically assigned by the SAP system while creation.

The master data of an equipment includes both **locational and financial data**. Hence whenever any maintenance work is carried out against an equipment, the expenditure would automatically be booked to the concerned **cost centre**, as per the master data.

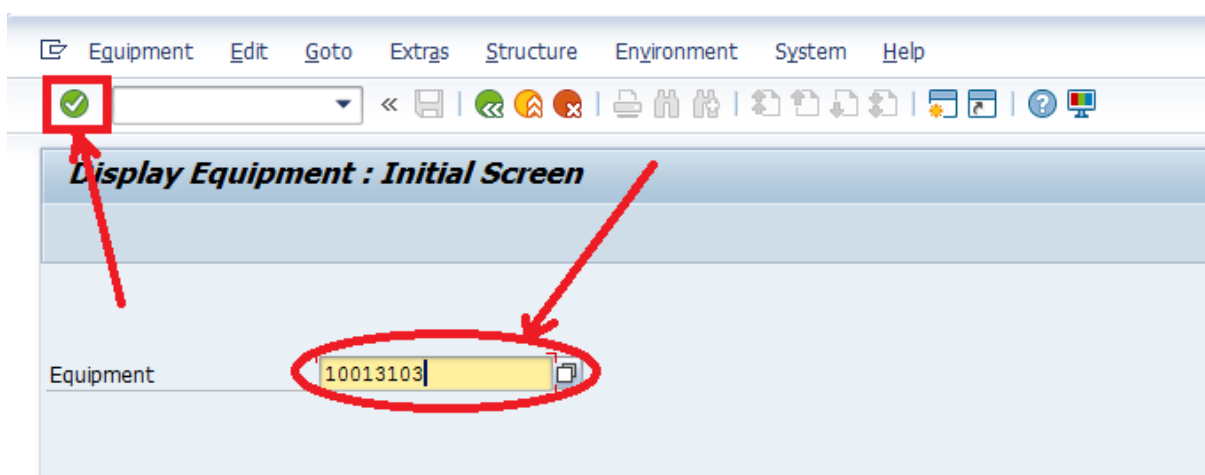
Creation of functional location and equipment objects in SAP is a one time job. The master data pertaining to functional locations is created by the functional **core team** at headquarters. However creation of SAP master data pertaining to the various equipment installed in substations and lines should be done by the **end users** only. The process of creation of **equipment objects** in SAP is explained in a separate document.

In this document, the master data pertaining to Equipment is explained with screen shots for the end user understanding purpose.

Step-1: Enter T-code **IE03** in the command field and click **enter** or click '**IE03-Display**' through navigation path in the SAP Easy Access screen as indicated below.



Step-2: Select the equipment ID through search button beside the field, enter the equipment ID and click **enter** button as indicated below.



Step-3: The master data pertaining to the equipment is entered in tab pages namely '**General**', '**Location**', '**Organization**', '**Structure**' and '**SerData**' etc. as indicated below.

The **status** field indicates the status of the equipment. The status **INST** indicates that the equipment is installed under a **functional location**. Other typical statuses of equipment are:

- **ESTO:** This status indicates that the equipment is in stock in any of the storage locations in any plant as **inventory** stock.
- **EDEL:** This status indicates that it is in inventory status and on a delivery.
- **AVLB:** This status indicates that it is no more in inventory status. But it is issued to the works and hasn't been assigned to any functional location yet. It may be noted that the equipment can be assigned to a functional location in the technical object structure only when it is in **AVLB** status.

Display Equipment : General

Equipment: 10013103 Category: M Machines

Description: 145KV SF-6 CIRCUIT BREAKER

Status: **INST**

Valid From: 07.09.2014 Valid To: 31.12.9999

General Location Organization Structure SerData

General data

Class:

Object type: CB 132KV 132KV CB

AuthorizGroup:

Weight: 0.000 Size/dimension:

Inventory no.: Start-up date: 19.02.2009

Reference data

AcquistnValue: 0.00 INR Acquisition date:

Manufacturer data

Manufacturer: CROMPTON GREAVES LTD(CGL) ManufCountry: IN

Model number: 120-SFM-32B Constr.yr/mth: /

ManufPartNo.:

ManufSerialNo.: 23873C

The **object type** field indicates the nature of the equipment.

Start-up date indicates the date of commissioning of the equipment.

The equipment manufacturer's data such as **Name. Model no, manufacturer serial number etc.** can be incorporated in **Manufacturer data** as shown above.

Step-4: In the **Location** tab, the information regarding where the functional location is located is entered as indicated below.

Display Equipment : Location

Equipment: 10013103 Category: M Machines
Description: 145KV SF-6 CIRCUIT BREAKER
Status: INST
Valid From: 07.09.2014 Valid To: 31.12.9999

General Location Organization Structure SerData

Location data

| | | |
|---------------|--------------------|---------------------------------|
| MaintPlant | 5104 | SE/O&M/Kadapa |
| Location | KDPAKPLMN | DIV-Kadapa-SD-CHINAKAMPALLY-MNT |
| Room | K020 | |
| Plant section | MVK | 132 Moolavanka 123 |
| Work center | MNT | MAINTENANCE |
| ABC indic. | B | Essential |
| Sort field | MDMA_K2AEQ_8000275 | |

Address

Name

Street

Location

Telephone

Fax

- The **Location** field indicates the combination of concerned **division and sub division** as shown above.
- The **Room** field indicates the **storage location** associated with the functional location.

A Storage location is a place wherein material stocks are reflected in SAP. The storage locations are defined in **Materials Management module** under each **plant**. All the **substations, subdivisions, divisions, circles** and **zones** are defined as storage locations. Whenever material/equipment is drawn from stores for O&M works, the same would be initially reflected as stock in respective storage locations before consumed for concerned works in SAP.

Similarly in all the central **stores plants** also various storage locations such as **indoor, outdoor** etc are defined for differentiating various types of stocks.

- All the **sub stations** in a plant are defined as **plant sections**. An abbreviation of substation name with **three** characters is used for denoting the **plant section**.
- **Work center** indicates the department which is responsible for maintenance of the **FL**.
- **ABC indicator** indicates the significance/importance of the **equipment**.

ABC indicators as mentioned below are incorporated depending upon the importance of the equipment.

A. Vital

B. Essential

C. Desirable

Step-5: In the **Organization** tab, the details pertaining to the **Accounting assignments** and **Responsibilities** is incorporated as indicated below.

The screenshot displays the SAP 'Display Equipment: Organization' interface. The 'Organization' tab is selected, showing account assignment and responsibility details for equipment 10013103, a 145KV SF-6 CIRCUIT BREAKER.

Equipment Details:

- Equipment: 10013103
- Category: M Machines
- Description: 145KV SF-6 CIRCUIT BREAKER
- Status: INST
- Valid From: 07.09.2014
- Valid To: 31.12.9999

Account assignment (highlighted in red):

| | | | |
|-----------------|------------|---------------|----------------------|
| Company Code | 3000 | APTRANSCO | VIJAYAWADA |
| Business Area | 5104 | SE/O&M/KADAPA | |
| Asset | | / | |
| Cost Center | 5104S20003 | / 3000 | ADE/ Maint/ C.K.Pall |
| WBS Element | | | |
| StandgOrder | | | |
| SettlementOrder | | | |

Responsibilities (highlighted in red):

| | | | |
|-----------------|---------|------------------|-------------|
| Planning plant | 5104 | SE/O&M/Kadapa | |
| Planner group | M19 | MNT1 1Moolavanka | 1234 |
| Main WorkCtr | MNT | / 5104 | MAINTENANCE |
| Catalog profile | FDR BAY | | Feeder Bay |

User data:

Latitude: []

- The **‘Company code’** in SAP is an organizational unit for which individual financial statements can be drawn according to the relevant commercial law. The company code for **APTransco** is **3000**. The same is indicated in all functional locations.
- The **‘Business Area’** is an accounting unit. At field level of **APTransco**, it is defined at each field circle level. **Financial** statements can be created for business areas for internal purposes i.e they help in segment reporting of company in its financial statements. It is a 4 digit code.
- The **Cost Center** is an organizational unit within a financial controlling area that represents a location where costs occur. The main function of a **cost center** is to track expenses.

All the O&M **subdivisions, divisions, circles** and **zones** are created as cost centers in SAP. The cost centers are created **plant wise**. The codes of all the cost centers in a plant begin with that **plant code**. For example the codes of all cost centers in **5104** plant begin with **‘5104’**.

- A **‘Planning Plant’** is the place in the organization where all the maintenance planning activities take place. Planning Plant is assigned to “Maintenance Plant” depending upon the type of maintenance planning. It is a 4 digit code. All the field OMC circles are defined as planning plants. **It may be noted that code for ‘Business Area’ and ‘Planning Plant’ is same.**
- **‘Planner Group’** is the group of employees who carry out the complete maintenance planning. The ‘Planner Group’ is created with respect to Planning Plant. It is a 3 digit alpha numeric key. The various roles and access permissions in SAP PM Module are defined with reference to the planner groups.
- A **Catalog profile** contains the **Catalog, Catalog groups, Catalog Codes and Code Texts** pertaining to that equipment.
‘Catalog’ is a master data in PM module. It is used to capture information related to maintenance history in the form of codes. The Catalog Codes and description can be stored in a Catalog. Hence a Catalog is a group of Catalog Codes. While entering the maintenance

history, the user can avoid entry of the same maintenance history again and again. He/she can simply use the predefined **Catalog Code**.

The catalog codes include various damages and causes that are likely to occur on the equipment.

Step-6: In the **structure** tab, the equipment is assigned to its **superior FL** in the technical object structure. It may be noted that the superior FL to the equipment in a **substation** is its **bay** as indicated below. The superior functional location can be changed if required.

Display Equipment : Structure

✓ [Dropdown] << [Icons]

Display Equipment : Structure

Class overview Measuring points/counters

Equipment 10013103 Category M Machines

Description 145KV SF-6 CIRCUIT BREAKER

Status INST

Valid From 07.09.2014 Valid To 31.12.9999

General Location Organization **Structure** SerData

Structuring

Functional loc. FB-132KV-MLVK-CKPL-01

Description FB-132KV-Moolavanka-CKPALLY-01

Superior Equip

Description

Position

TechIdentNo.

ConstType

Equipment

| Pos. | Equipment | Sb-Eq | Description | EqmtType | Mfr |
|------|-----------|--------------------------|-------------|----------|-----|
| | | <input type="checkbox"/> | | | |
| | | <input type="checkbox"/> | | | |
| | | <input type="checkbox"/> | | | |
| | | <input type="checkbox"/> | | | |
| | | <input type="checkbox"/> | | | |

Step-7: In the **SerData tab**, the **material number** and **serial number** of the equipment is incorporated as indicated below.

It may be noted that the material number is the inventory ID of the equipment while it was in inventory status prior to its creation as an equipment in service in the technical object structure. The inventory ID indicates the technical features/parameters of the equipment in 'Materials Management module'.

The serial number is the unique number issued to all the serialized inventory materials.

Display Equipment : SerNo.Detail

Display Equipment : SerNo.Detail

Class overview Measuring points/counters

Equipment 10013103 Category M Machines

Description 145KV SF-6 CIRCUIT BREAKER

Status INST

Valid From 07.09.2014 Valid To 31.12.9999

Organization Structure SerData Warranty & Documents

General

Material 10001379 132KV 3POLE 1600A 31.5KA SF6 CIRCUIT BRE

Serial Number 23873C

Last SerialNo 52145 History

Stock information

Stock type Plant StorageLocation Stock batch Special stock Customer Sales order / 0

Company Code Master batch Date L.GoodsMvt Vendor WBS element

Step-8: Measuring Points/Counters:

- The measuring points on Equipment are the various parameters that indicate the equipment healthiness status/performance.
- The values of measuring points are recorded whenever various tests are performed from time to time as part of maintenance activities carried out on the equipment.
- The measuring points on each equipment should be **predefined** and **created as master data** in order to update the values of the same from time to time.
- Each measuring point on an equipment is assigned a **unique ID** by the system, while creation.

Click on **Measuring Points/Counters** as indicated below to view the measuring points created for the equipment as shown in the second screen shot below.

The screenshot shows the 'Display Equipment : General' form. A red arrow points to the 'Measuring points/counters' tab, which is circled in red. The form displays the following data:

| Equipment | | Category | M | Machines |
|-------------|----------------------------|----------|------------|----------|
| Description | 145KV SF-6 CIRCUIT BREAKER | | | |
| Status | INST | | | |
| Valid From | 07.09.2014 | Valid To | 31.12.9999 | |

Below the main data fields, there are three tabs: General, Location, and Organization. The 'General' tab is selected, showing the following data:

| General data | |
|----------------|-------------------|
| Class | |
| Object type | CB 132KV 132KV CB |
| AuthorizGroup | |
| Weight | 0.000 |
| Inventory no. | |
| Size/dimension | |
| Start-up date | 19.02.2009 |

Below the 'General data' section, there are two tabs: Reference data and Manufacturer data. The 'Reference data' tab is selected, showing the following data:

| Reference data | |
|------------------|----------|
| AcquistnValue | 0.00 INR |
| Acquisition date | |

Below the 'Reference data' section, there are two tabs: Manufacturer data and SerData. The 'Manufacturer data' tab is selected, showing the following data:

| Manufacturer data | |
|-------------------|---------------------------|
| Manufacturer | CROMPTON GREAVES LTD(CGL) |
| Model number | 120-SFM-32B |
| ManufPartNo. | |
| ManufSerialNo. | 23873C |

The “**MeasDocuments**” indicate the measuring documents created for various measuring points. Measuring documents are nothing but the readings of various measuring points recorded from time to time.

Display Measuring Points: Overview

Equipment: 10013103
Description: 145KV SF-6 CIRCUIT BREAKER

| MeasPoint | Measurement position | Cat | Char. Name | CodeGrp | V | Counter | Unit |
|---------------------------------------|----------------------|-----|-------------|---------|---|---------|------|
| <input type="checkbox"/> 1939758 | AIR-L/O | M | PRESSURE | | | | bar |
| Checking of Operational L/O-Air L/O | | | | | | | |
| <input type="checkbox"/> 1939712 | ARC-LN-B-BR1 | M | MILLI-METER | | | | mm |
| Arcing Contact length B phase Break 1 | | | | | | | |
| <input type="checkbox"/> 1939717 | ARC-LN-B-BR2 | M | MILLI-METER | | | | mm |
| Arcing Contact length B phase Break 2 | | | | | | | |
| <input type="checkbox"/> 1939711 | ARC-LN-R-BR1 | M | MILLI-METER | | | | mm |
| Arcing Contact length R phase Break 1 | | | | | | | |
| <input type="checkbox"/> 1939714 | ARC-LN-R-BR2 | M | MILLI-METER | | | | mm |
| Arcing Contact length R phase Break 2 | | | | | | | |
| <input type="checkbox"/> 1939718 | ARC-LN-Y-BR1 | M | MILLI-METER | | | | mm |
| Arcing Contact length Y phase Break 1 | | | | | | | |
| <input type="checkbox"/> 1939715 | ARC-LN-Y-BR2 | M | MILLI-METER | | | | mm |
| Arcing Contact length Y phase Break 2 | | | | | | | |
| <input type="checkbox"/> 1939757 | BDV | M | KILO-VOLT | | | | kV |
| Breakdown Voltage of oil | | | | | | | |

Whenever new equipment is created through copy from a reference equipment, the measuring points can also be copied. However each of the measuring points pertaining to the newly created equipment is automatically assigned **new IDs** by the system.

Further, there is also provision for copying exclusively **measuring points** alone from one equipment to the other. In this case also the system assigns unique new IDs to each of the copied measuring points.

The processes of creating new equipment and measuring points through copy is explained in separate documents.