AC510

Cost Object Controlling for Products

- R/3 System
- Release 4.6C
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### Course Prerequisites

- **Required**
  - Basic knowledge of the logistical processes dealt with in the course
  - AC 505
- **Recommended**
  - AC 040
Target Audience

- **Participants:**
  - Project team
- **Duration:** 3 days

Notes to the User

- The training materials are **not teach-yourself programs.** They **complement the instructor’s explanations.** The pages provide space for you to write down additional information.

- There may not be enough time to do all exercises. The exercises are additional examples that are treated during the course. Participants can use these examples to further their understanding after the course.
Course Overview

Contents:

- Course Goals
- Course Objectives
- Course Content
- Course Overview Diagram
- Main Business Scenario
Course Goals

At the conclusion of this course, you will be able to:

- Explain the features of *Cost Object Controlling* in different business scenarios
- Explain the functionality and integration of *Product Cost by Period* and *Product Cost by Order*
- Analyze important key figures using the information system
- Make the necessary Customizing settings for the processes described in the course
Course Objectives

At the conclusion of this course, you will be able to:

- Use the *Product Cost by Period* functions with product cost collectors
- Use the *Product Cost by Order* functions with manufacturing orders
- Analyze and generate aggregate data in the information system
- Discuss the benefits of using the *Schedule Manager* to perform the period-end closing process quickly and efficiently
# Course Content

## Preface

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## Appendix
Course Overview Diagram

- **Introduction**
- **Course Overview**
- **Material Valuation**
- **Product Cost by Period**
- **Product Cost by Order**
- **Schedule Manager**
- **Information System**
- **Appendix**

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Main Business Scenario

We are in a manufacturing company with the following logistical processing environment:

- Pumps of the same type are manufactured over an extended length of time
  - The pumps are manufactured both in repetitive manufacturing using production versions and in order-related production using production orders. In this course we will examine the production process that uses production orders.
- Fertilizer is manufactured
  - The production process yields both fertilizer and other products. The manufacturing type is process manufacturing.
Introduction

- Integration of Product Cost Controlling
- Components of Product Cost Controlling
- Cost Object Controlling
  - Product Cost by Period
  - Product Cost by Order
  - Cost object Controlling in Sales-Order-Related Production
- Cost Objects in Product Cost by Order and Product Cost by Period
- Sequence of steps in Cost Object Controlling

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Introduction: Unit Objectives

At the conclusion of this unit, you will be able to:

- Determine the location of Product Cost Controlling within Accounting
- Describe the components of Product Cost Controlling
- Explain the difference between periodic, order-related, and sales-order-related Cost Object Controlling
- Explain the characteristics of and differences between the available cost objects
- Describe the phases of Cost Object Controlling
Introduction: Course Overview Diagram

AC510

Material Valuation

Product Cost by Period

Product Cost by Order

Schedule Manager

Information System

Appendix

Introduction

Course Overview

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Analysis of the business processes in the company showed that the production types being used are order-related production, repetitive manufacturing, and process manufacturing.

The applicability and usefulness of the different methods in Cost Object Controlling are investigated. This requires that the difference between the type of information provided by Product Cost by Period and that provided by Product Cost by Order be understood.

Further issues include the potential benefits offered in using Cost Object Controlling in sales-order-related production.
**CO Components**

- **Profitability Analysis**
  - How profitable are the individual market segments?

- **Overhead Cost Controlling**
  - How can we reduce our overhead?
  - Are the responsibility areas working efficiently?
  - How high are the costs of organizational activities? Is spending kept within budget?
  - How can we optimize internal processes?

- **Product Cost Controlling**
  - What are the manufacturing costs of a product?

- **Cost Element Accounting**
  - What costs are incurred within the organization?

---

- **How can we reduce our overhead?** Many companies are seeing their overhead costs increase dramatically. These include costs that cannot be attributed directly to products or services. **Cost Center Accounting (CO-OM-CCA)** examines the locations within a company where overhead is incurred. **Overhead Orders (CO-OM-OPA)** collect and monitor costs in accordance with the jobs performed in the company. **Activity-Based Costing (CO-OM-ABC)** helps optimize business processes and supplies information for strategic decision making.

- **What are the manufacturing costs of a product?** You analyze the costs attributable directly to products with **Product Cost Controlling (CO-PC)**. You can use **Product Cost Planning** to analyze the cost structure of your products. **Cost Object Controlling** assigns the costs incurred in the company to the activity units of the company (such as products, product groups, and orders).

- **How profitable are the individual market segments?** The **Profitability Analysis (CO-PA)** component analyzes the earnings and contribution margins of market segments, structured by products, customers, orders, or combinations of these, or by organizational units such as sales organizations or business areas.
The diagram above illustrates the flow of quantities and values among the components of the SAP System from the accounting perspective.

The quantity flow is initiated by processes in Logistics (procurement, production, goods movements, sales, invoicing).

The valued goods movements are updated to cost objects by the Product Cost Controlling component.

Product Cost Controlling includes the following functions:

- Calculation of the standard cost of semifinished and finished products.
- Preparation of detailed cost information for the computation of cost variances and valuations in profitability analysis.
- Planning and monitoring costs on cost objects (such as production orders, projects, process orders, and sales orders).
- Calculation of work in process.
- Calculation of cost variances in production and planning.
- Settlement of production variances to Financial Accounting and Profitability Analysis.
Road Map: Overview of Product Cost Controlling

- Integration of Product Cost Controlling
- Components of Product Cost Controlling
- Cost Object Controlling
  - Product Cost by Period
  - Product Cost by Order
  - Cost Object Controlling in sales-order-related production
- Cost Objects in Product Cost by Order and Product Cost by Period
- Sequence of steps in Cost Object Controlling
Product Cost Controlling: Benefits

Management Requirements

- Support of cost reduction concepts
- Support of strategic decision making
  - Which products to produce?
  - Manufacturing location/method?
- Support of operative decision making
  - Pricing
  - Manufacturing efficiency

Legal Requirements

- Valuation of:
  - Raw materials
  - Semifinished goods
  - Finished goods
  - Work in process
  - Reserves for imminent losses

- Determination of your production efficiency:
  - Establishment of standard cost of goods manufactured for comparing target costs with actual costs.
  - Variance analysis to determine why the actual costs were not the same as the target costs.
  - Key figure reports summarized at the plant, product group, and product level.

- Support of strategic decision making:
  - Contribution margins for specific manufacturing levels of the partners involved in the production process.
  - Internal activities and process costs, showing the original production factors.
  - Scrap costs.

- Inventory valuation:
  - Alternative valuation methods (legal valuation, group valuation, profit center valuation)
  - Valuation in three currencies
  - Establishment of standard cost of goods manufactured
  - Calculation of periodic product prices based on actual costs

- Valuation of work in process (WIP).

- Reserves for imminent loss and for unrealized costs in sales order costing.
Cost estimates with a quantity structure are used to plan costs and set prices for materials before an order to commence manufacturing is received. This type of cost estimate requires a BOM and routing (in PP) or a master recipe (in PP-PI) for the material being costed.

You can use the Product Cost Planning component for the following purposes:

- To determine the budgeted cost of goods manufactured and cost of goods sold for each product unit.
- To see the cost breakdown for each product and the value added for each step in the manufacturing chain.
- To optimize a product’s cost of goods manufactured by comparing different cost estimates.
- To supply information for other SAP applications, such as:
  - Standards for judging production efficiency in Cost Object Controlling
  - Prices to be written to the material master and transferred to Profitability Analysis
  - Price floors for Sales and Distribution
Cost Object Controlling assigns the costs incurred in the company to the activity units of the company (such as products, product groups, and orders).

Cost Object Controlling provides real-time cost management functions that determine the cost of goods manufactured in all plants.

You can use Cost Object Controlling to determine the cost of goods manufactured or the cost of goods sold for company activities. You can:

- Calculate the planned cost of the planned order quantity for logistical orders.
- Calculate the planned cost of make-to-order products.
- Accumulate actual costs for all cost objects.
- Compare actual costs against target costs and analyze variances.
- Determine price floors for products or orders.

You can use the functions of Cost Object Controlling on the basis of lots or periods.

Product Cost Controlling provides information for the following business functions: Inventory valuation in Financial Accounting; controlling the cost of goods manufactured in Cost Object Controlling, Profitability Analysis, and Profit Center Accounting.
The Actual Costing/Material Ledger component provides the following capabilities:

- Inventories can be carried in more than one currency and with historical exchange rates.
- Multiple valuation of inventories provides you with a legal, group, and internal view of your company.
- Inventories can be valuated with the actual costs of the period.

The Actual Costing function calculates the following data:

- In single-level material price determination:
  Actual costs for raw materials, purchased parts, and trading goods using the transaction data and invoice receipts for the materials. At the end of the period, the system uses this information to calculate prices on the basis of the actual costs.

- In multilevel material price determination:
  Actual costs for semifinished and finished goods on the basis of transaction data, provided that goods movements and invoice receipts for the materials are entered into the system or orders for the production of these materials are settled. In addition, the system uses a separate quantity structure created on the basis of goods movements so that the inventory value of the finished products contains the true costs of the raw materials plus all follow-up costs.
Road Map: Overview of Product Cost Controlling

- Integration of Product Cost Controlling
- Components of Product Cost Controlling
- **Cost Object Controlling**
  - Product Cost by Period
  - Product Cost by Order
  - Cost Object Controlling in sales-order-related production
- Cost Objects in Product Cost by Order and Product Cost by Period
- Sequence of steps in Cost Object Controlling
What actual costs did we incur in our area in the current period?

What costs were we expecting based on the quantity manufactured?

Are some product groups performing significantly better than others?

What is causing these variances?

What are the scrap costs of our new production line?

Did our continuous improvement efforts have any effect on costs?
The application component *Product Cost by Period* enables periodic analysis of costs at the level of products.

In contrast to *Product Cost by Order* in which you normally analyze costs by lot, in *Product Cost by Period* you analyze costs by period. This means that you collect costs on a cost object over an extended length of time, and analyze the debits and credits to the cost object in each period.

You normally use the *Product Cost by Period* component in the following situations:

- In repetitive manufacturing environments. In repetitive manufacturing, you always record and analyze costs on the basis of product cost collectors.
- In order-related production or process manufacturing when you are not interested in analyzing the costs of orders. In this case you don’t record the costs on the manufacturing orders. Instead, you create a product cost collector and record the costs on that.
- When you have costs that you don’t want to (or cannot) assign to individual orders. In this case, you create a cost object hierarchy and assign these costs to the nodes of the hierarchy.

**Environments**

- High-volume production
- Stable manufacturing environment
- Individual lot-based cost measurement is not required
- Costs are collected on product cost collectors
- Example: repetitive manufacturing
The application component Product Cost by Order enables costs to be analyzed at the level of manufacturing orders. You can use the Product Cost by Order component with make-to-stock production and sales-order-related production. In sales-order-related production, you can use the Product Cost by Order component in mass production environments on the basis of sales orders, and as a supplement to the Product Cost by Sales Order component (including complex make-to-order production).

In the Product Cost by Order component, you use the manufacturing orders as the cost objects. The costs updated on manufacturing orders are usually analyzed and settled by lot. This means that in most cases, variances are not determined until the entire quantity to be manufactured has been received into inventory.

The costs for manufacturing orders can also be analyzed and settled by period. However, SAP recommends analyzing and settling manufacturing orders by lot rather than by period. If you want to analyze and settle the costs by period, you should use product cost collectors. For detailed information, refer to the following units.
In a sales-order-related production environment, there are two ways to collect and analyze costs:

- In mass production on the basis of sales orders, the focus of cost measurement is on the material being manufactured. If you are using a valuated sales order inventory in a mass production environment, you can collect and analyze the costs on manufacturing orders (production orders or process orders) or on product cost collectors. In this case you implement only the functions of **Product Cost by Period** / **Product Cost by Order**. The flow of quantities and values corresponds to that of make-to-stock production, while the cost controlling approach is that of **Product Cost by Period** / **Product Cost by Order**.

- In complex make-to-order production, you collect and analyze the costs separately for each sales order item. In this case you implement the functions of **Product Cost by Sales Order**.

You can use **Product Cost by Sales Order** in the following cases:

- When you are manufacturing in-house with reference to a sales order in a complex make-to-order environment.

- When you purchase merchandise with reference to a sales order and resell the merchandise to the customer.

- When you perform services on the basis of a sales order.
Road Map: Overview of Product Cost Controlling

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- Cost Objects in Product Cost by Order and Product Cost by Period
- Sequence of Steps in Cost Object Controlling
In the Product Cost by Order component, the cost objects are the manufacturing orders.

Production orders are mostly used in order-related production environments. In process manufacturing environments, you will normally use process orders.

You can determine the planned costs for a production order in the following ways:

- When you create the order.
- When you release the order.
- By manually initiating preliminary costing.

Once the order has been released, you can collect actual costs.

During the manufacturing process, actual costs are accumulated on the production order through various events such as goods receipts and internal activity allocations. You can see the actual costs and the planned costs on the production order at any time.

At the end of the period, you perform the period closing activities for the production order by allocating the period costs, determining the work in process and variances, and settling.

You can determine the variances for the production order either cumulatively (based on the lot) or periodically.
The application component *Product Cost by Period* enables periodic analysis of costs at the product level.

In contrast to *Product Cost by Order* in which you analyze costs by lot, in *Product Cost by Period* you analyze costs by period. This means that you collect the costs on a cost object over an extended period of time, and analyze the debits and credits in each period.

Product cost collectors enable you to collect costs at the product level independently of the production type. Regardless of whether the production environment is order-related production, process manufacturing, or repetitive manufacturing, you collect the production costs for the product on a product cost collector and analyze the costs in each period.

You can determine the preliminary cost estimate for a product cost collector in the following ways:

- When you create the product cost collector.
- When you save the product cost collector.
- By initiating collective processing for creating preliminary cost estimates.

The use of product cost collectors does not prevent you from performing logistical functions on the manufacturing order or production version (such as goods issues, confirmations, and goods receipts). The costs incurred from the logistical transactions are updated directly on the product cost collector.

At the end of the period, you perform the period closing activities for the product cost collector by allocating the period costs, determining the work in process and variances, and settling.
A cost object hierarchy contains cost object nodes that are in a hierarchical relationship to each another.

The orders (product cost collectors and manufacturing orders) assigned to cost object hierarchies must always be settled periodically.

You use a cost object hierarchy to collect actual costs when:

- You have actual costs that cannot be assigned to product cost collectors or manufacturing orders.
- You have actual costs that you don’t want to collect on product cost collectors or manufacturing orders because you are not interested in assigning costs at that level.
Road Map: Overview of Product Cost Controlling

- Integration of Product Cost Controlling
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  - Cost Object Controlling in sales-order-related production
- Cost Objects in Product Cost by Order and Product Cost by Period
- Sequence of steps in Cost Object Controlling
What **actual costs** did we incur in our area in the current period?

What costs were we expecting based on the **quantity manufactured**?

Are some product groups **performing significantly better** than others?

What is causing these **variances**?

What are the **scrap costs** of our new production line?

Did our **continuous improvement** efforts have any effect on costs?
You precost a cost object (product cost collector, production order or process order) for the following purposes:

- To determine the planned costs of the material being manufactured based on the planned lot size of the order.
- To determine the planning variances, helping you decide which production version to manufacture.
- So that you can later determine the production variances.

If your cost object is a manufacturing order, the system uses the components and operations identified on the order to determine the planned costs.

If your cost object is a product cost collector, the system uses the quantity structure determination of the costing variant to access the master data for production, using the same process as with a material cost estimate.
- Actual costs for cost objects are recorded in the Cost Object Controlling component. This process of recording actual costs is called simultaneous costing.

- In Product Cost by Period, you can record actual costs for product cost collectors and cost object hierarchies. In Product Cost by Order, you can record actual costs for manufacturing orders (production orders or process orders).

- Cost objects can be charged with actual (primary) costs through postings in the following components:
  - Financial Accounting (FI)
  - Materials Management (MM)
  - Human Resources (HR)

- Cost objects can be charged with secondary costs by means of:
  - Postings in Controlling (CO) or by the use of time sheets (CATS).

- Cost objects can also be charged with actual costs by means of confirmations in Logistics (LO):
  - A cost object can be charged with secondary costs through internal activity allocations that are executed automatically when the confirmation is entered.
  - A cost object can be charged with primary costs through material withdrawals that are executed automatically when the confirmation is entered.
### Period-End Closing

#### Schedule Manager

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<th><strong>FI/CO - Posting</strong></th>
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<td>Settlement</td>
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<td>Target Costs, Scrap,</td>
<td></td>
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<tr>
<td></td>
<td>Variances</td>
<td></td>
</tr>
<tr>
<td>Overhead</td>
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#### You can use the Schedule Manager in the period-end closing functions of **Product Cost by Order** and **Product Cost by Period**. This allows the use of a multilevel worklist. The multilevel worklist enables you to:

- View the objects that have errors for a particular processing step.
- Correct the errors, or set a processing status that tells the system to skip processing in a particular processing step.
- Restart the processing step sequence after correcting the error or setting processing statuses.

#### The following individual functions are available in the period-end closing area of **Product Cost by Period** and **Product Cost by Order**:

- Template allocation for allocation of process costs and activity types.
- Revaluation of activity types and business processes with actual prices.
- Calculation of overhead expenses.
- Preliminary settlement of co-products, rework.
- WIP calculation.
- Variance calculation.
- Settlement to **Financial Accounting**, **Profit Center Accounting**, **Actual Costing/Material Ledger**, and **Profitability Analysis**.
In *Product Cost by Order*, work in process is valuated at actual cost. Work in process is the difference between the actual costs debited to the order and the actual costs credited to the order. The system reports work in process until the order has the status DLV (delivered) or TECO (technically completed).

No variances are calculated until the order is delivered because the *Product Cost by Order* component is lot-based. That is, the system does not know the final output quantity on which the variance calculation process is based until the order has been delivered.

Therefore, by definition it is not possible to see both work in process and variances in *Product Cost by Order*. 
In Product Cost by Period, the work in process is valuated at target cost. The basis for this valuation is:

- In repetitive manufacturing: the reporting point backflushes.
- In order-related production: the operation quantities.
- In process manufacturing: the quantities confirmed at the phases.

The quantity used to determine the work in process at a given operation is the difference between the confirmed production quantities for the operations preceding and following that operation.

The variances are determined from the production quantity received into inventory during the period. The standard cost of the product is adjusted to reflect the production quantity (target costs) and compared with the net actual cost of the period.
### Comparison of Product Cost by Period and Product Cost by Order

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<td>PER</td>
</tr>
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<td>Work in process</td>
<td>WIP at actual cost</td>
<td>WIP at target cost</td>
</tr>
<tr>
<td>Variances</td>
<td>Variances = Actual cost - Valuated GR</td>
<td>Variances = Actual cost - Valuated GR - WIP</td>
</tr>
<tr>
<td>Settlement</td>
<td>Should be performed by period</td>
<td>Must be performed by period</td>
</tr>
<tr>
<td>Cost object hierarchy</td>
<td>Not possible</td>
<td>Possible</td>
</tr>
</tbody>
</table>

- The SAP application component *Product Cost by Period* determines product costs for the cost objects *product cost collector* and *cost object hierarchy*. The costs for these cost objects can only be analyzed by period.
- The SAP application component *Product Cost by Order* determines product costs for the cost objects *production order* and *process order*. These cost objects can be analyzed either by lot or by period.
You are now able to:

- Explain how the Product Cost Controlling component is integrated into the R/3 System
- Describe the work areas of Product Cost Controlling
- Explain how the Product Cost by Period and Product Cost by Order components differ from the Product Cost by Sales Order component
- Describe the cost objects in the Product Cost by Order and Product Cost by Period components
- Describe the sequence of steps in Cost Object Controlling
- Explain the difference between Product Cost by Period and Product Cost by Order
Exercises

Unit: Introduction
Topic: Overview of Cost Object Controlling

At the conclusion of this exercise, you will be able to:

- Discuss the components of the CO-PC application in regards to product cost planning costing, actual costing/material ledger, and cost object controlling.
- Explain the differences between controlling by period, controlling by order and controlling by sales order.

You are evaluating the different components of the CO-PC application, and need to determine what type of information and analysis is available for the different methods of cost object controlling.

1-1 Answer the following questions in regards to which controlling component would be utilized to provide the necessary information and analysis.

1-1-1 The value of work-in-process at period end is calculated with which CO-PC component?
Answer:

1-1-2 The ability to calculate actual product costs at period close is enabled by which CO-PC component?
Answer:

1-1-3 The creation of cost estimates for the production of goods or services is provided by which CO-PC component?
Answer:

1-1-4 Variances and scrap costs are calculated within which CO-PC component at period close?
Answer:

1-2 Answer true or false for the following statements.

1-2-1 It is always possible to recognize the variances in the period in which they occur when using product cost by order.
Answer:

1-2-2 Product cost by order can utilize a production order as the cost object.
Answer:
1-2-3  A benefit of product cost by period can be the reduction of the quantity of cost objects to process during period end close.
Answer:

1-2-4  Repetitive production is best suited for the product cost by order method.
Answer:

1-2-5  Product cost by sales order is recommended for controlling complex make-to-order production.
Answer:
Unit: Introduction
Topic: Cost Objects in Cost Object Controlling

At the conclusion of this exercise, you will be able to:

- Explain the cost objects available to the product cost by period and product cost by order controlling methods.

Your company has decided to implement cost object controlling in the R/3 System. As a member of your company's project team, you need to be able to provide advice regarding which cost objects represent the logistic processes in the best way and satisfy the requirements in cost object controlling. In preparation, you will review the different controlling methods and what cost objects are available for the methods.

2-1 Answer the following questions as either true or false.

2-1-1 Product cost by order is recommended when cost traceability for each order is needed.
Answer:

2-1-2 Cost object hierarchies are used with the product cost by order method.
Answer:

2-1-3 Make-to-order manufacturing can utilize either the product cost by order or product cost by period controlling methods.
Answer:

2-1-4 If a production order is not a cost object, cost collection and analysis for the product is accomplished through a product cost collector.
Answer:

2-2 Determine the best method of controlling for each scenario and which cost objects would be used. Briefly explain your decision.

2-2-1 Product X has been produced for more than 6 months with no variation in production method. Manufacturing utilizes production orders to manage Product X on the production floor. Variances and scrap cost should be transferred to Profitability Analysis in the period in which they occur.
Answer:
2-2-2  Product Y has been produced for 12 months using production orders. Each production lot produces a varying quantity and incurs high set-up costs. In addition, there are significant differences in variances between production orders.

Answer:

2-2-3  Product Z is a make-to-order product that is completed on an assembly line. There is no requirement to calculate Work in Process for this product at period close. In addition, Product Z is a high volume product that requires no special sales cost on the sales orders.

Answer:

2-2-4  Products W and V are jointly manufactured products that are produced using process orders. Each product has its own standard and requires the individual calculation of WIP, scrap and variances.

Answer:
Exercises

Unit: Introduction
Topic: Prerequisites and Steps

At the conclusion of this exercise, you will be able to:

- List the main steps performed for the cost objects and list the differences between product cost by period and product cost by order.

As a continuation of the review of the cost object controlling methods available in the R/3 System, you have been asked to outline the basic steps performed for the cost objects and identify any differences between the product cost by period and product cost by order methods.

3-1 List the 3 main controlling phases of a cost object:
   1. 
   2. 
   3. 

3-2 Identify the correct sequence for the following period end closing tasks.

   - Work in process
   - Revaluation of actual prices
   - Variance Calculation
   - Settlement
   - Process Allocation
   - Overhead calculation

3-3 Identify the main differences between the product cost by period and product cost by order for the following steps:

   3-3-1 Preliminary cost estimate:
   3-3-2 Posting actual costs:
   3-3-3 Period end closing:
3-4 Display the customizing settings for the order type parameters and the plant dependent order type settings.

3-4-1 What is the settlement type defined for the order type **PP01**, plant **1000**?

3-4-2 What is the settlement type defined for the order type **RM01**, plant **1000**?

3-4-3 Is the product cost collector indicator selected for the plant dependent settings for order type **PP08** in plant **1000**?

3-4-4 Is the product cost collector indicator selected for the plant dependent settings for order type **PI01** in plant **1100**? What is the impact of this indicator NOT being selected?
1-1 Answer the following questions in regards to which controlling component would be utilized to provide the necessary information and analysis.

1-1-1 The value of work-in-process at period end is calculated with which CO-PC component?

Answer: Work-in-process is calculated within the Cost Object Controlling component.

1-1-2 The ability to calculate actual product costs at period close is enabled by which CO-PC component?

Answer: The ability to calculate actual product costs at period close is within the Actual Costing/Material Ledger component.

1-1-3 The creation of cost estimates for the production of goods or services is provided by which CO-PC component?

Answer: Costs estimates are created within the Product Cost Planning component.

1-1-4 Variances and scrap costs are calculated within which CO-PC component at period close?

Answer: Variances and scrap are calculated within the Cost Object Controlling component.

1-2 Answer true or false for the following statements.

1-2-1 It is always possible to recognize the variances in the period in which they occur when using product cost by order.

Answer: False, it is necessary to use product cost by period to ensure that variances are recognized in the period in which they occur. With product cost by order, all variances are recognized in the period in which the order is completed.

1-2-2 Product cost by order can utilize a production order as the cost object.

Answer: True, product cost by order can utilize a production order or process order as a cost object.

1-2-3 A benefit of product cost by period can be the reduction of the quantity of cost objects to process during period end close.

Answer: True. If a product cost collector is used instead of the manufacturing order, each production process will have one product cost collector to be processed at period end close. In contrast, if there is no product cost collector, each individual production order will have to be processed at period end close.
1-2-4 Repetitive production is best suited for the product cost by order method.
   Answer: False, repetitive manufacturing is best suited for product cost by period.

1-2-5 Product cost by sales order is recommended for controlling complex make-to-order production.
   Answer: True, complex make-to-order manufacturing is best suited for product cost by sales order.
Answer the following questions as either true or false.

2-1-1 Product cost by order is recommended when cost traceability for each order is needed.

Answer: True. If it is necessary to analyze the costs by specific manufacturing order, then product cost by order is recommended.

2-1-2 Cost object hierarchies are used with the product cost by order method.

Answer: False, cost object hierarchies are utilized with the product cost by period method.

2-1-3 Make-to-order manufacturing can utilize either the product cost by order or product cost by period controlling methods.

Answer: True. Make-to-order manufacturing can utilize either product cost by order or product cost by period methods.

2-1-4 If a production order is not a cost object, cost collection and analysis for the product is accomplished through a product cost collector.

Answer: True, all controlling functions are accomplished through a product cost collector.

Determine the best method of controlling for each scenario and which cost objects would be used.

2-2-1 Product X has been produced for more than 6 months with no variation in production method. Manufacturing utilizes production orders to manage Product X on the production floor. Variances and scrap cost should be transferred to Profitability Analysis in the period in which they occur.

Answer: Product Cost by period with a product cost collector. Product cost by period should be utilized so that the variances and scrap can be calculated in the period in which they occurred. A product cost collector should be used because the product is stable, so it is not necessary to collect or analyze the costs at the individual production order level.

2-2-2 Product Y has been produced for 12 months using production orders. Each production lot produces a varying quantity and incurs high set-up costs. In addition, there are significant differences in variances between production orders.
Answer: Product cost by order using production orders. Since there are high set-up costs and varying lot quantities, analysis should be done at the production order level. In addition, since variances are significantly different for each production order, it would be beneficial to have cost traceability to the individual production lot.

2-2-3 Product Z is a make-to-order product that is completed on an assembly line. There is no requirement to calculate Work in Process for this product at period close. In addition, Product Z is a high volume product that requires no special sales cost on the sales orders.

Answer: Product cost by period using a product cost collector. This is a high volume product without any need to analyze the cost within Controlling by sales order.

2-2-4 Products W and V are jointly manufactured products that are produced using process orders. Each product has its own standard and requires the individual calculation of WIP, scrap and variances.

Answer: Product cost by order using process orders. The capability to calculate WIP, scrap and variances for joint production is only available with the product cost by order method.
3-1 List the 3 main controlling phases of a cost object:
   1. Preliminary cost estimate
   2. Posting Actual Costs
   3. Period-end closing

3-2 Identify the correct sequence for the following period end closing tasks.

   4 Work in process
   2 Revaluation of actual prices
   5 Variance Calculation
   6 Settlement
   1 Process Allocation
   3 Overhead calculation

3-3 Identify the main differences between the product cost by period and product cost by order for the following steps:

3-3-1 Preliminary cost estimate: With **product cost by order**, the preliminary cost utilizes the operations and components identified in the production (or process) order. With **product cost by period** utilizing a product cost collector, the operations and components are determined for the production process.

3-3-2 Posting actual costs: With **product cost by order**, all actual costs are posted directly to the production or process order. With a product cost collector, the logistic transactions are posted with reference to the production order, but the costs are collected on the product cost collector. For repetitive manufacturing, the logistic transactions are posted with reference to the material and version, and the costs are collected on the product cost collector.
3-3-3 Period end closing: With product cost by order, all period end closing activities must be executed for each production or process order. With product cost by period, the period end closing needs only be processed for the product cost collector. In addition, product cost by period utilizes periodic settlement, while product cost by order normally utilizes full settlement.

3-4 Display the customizing settings for the order type parameters and the plant dependent order type settings.

*Tools → Accelerated SAP → Customizing → Edit Project*

Choose SAP Reference IMG

*Controlling → Product Cost Controlling → Cost Object Controlling →*

3-4-1 What is the settlement type defined for the order type PP01, plant 1000?

*Product Cost by Order → Manufacturing Orders → Define Cost-Accounting-Relevant Default Values for Order Types and Plants*

Select plant 1000, Order type PP01

Choose *Details*

The settlement type is PP1, full settlement

3-4-2 What is the settlement type defined for the order type RM01, plant 1000?

*Product Cost by Period → Product Cost Collectors → Define Cost-Accounting-Relevant Default Values for Order Types and Plants*

Select plant 1000, Order type RM01

Choose *Details*

The settlement type is STR, Tracing factor determination

3-4-3 Is the product cost collector indicator selected for the plant dependent settings for order type PP08 in plant 1000?

*Product Cost by Order → Manufacturing Orders → Define Cost-Accounting-Relevant Default Values for Order Types and Plants*

Select plant 1000, Order type PP08

Choose *Details*

Yes, the product cost collector indicator is selected.
3-4-4 Is the product cost collector indicator selected for the plant dependent settings for order type PI01 in plant 1100? What is the impact of this indicator NOT being selected?

*Product Cost by Order → Manufacturing Orders → Define Cost-Accounting-Relevant Default Values for Order Types and Plants*

Select plant 1000, Order type PI01

Choose Details

No, the product cost collector indicator is not selected. If this indicator is not selected, the process order will be a cost object.
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<th>Master Data</th>
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<td>Product cost collector</td>
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<td>Production process</td>
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<tr>
<th>Preliminary Costing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material costs</td>
</tr>
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<td>Direct manufacturing costs</td>
</tr>
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<td>Overhead and process costs</td>
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</table>
Simultaneous costing
  - Goods movements
  - Confirmations

Period-end closing
  - Template allocation
  - Revaluation at actual prices
  - Actual overhead expenses
  - Work in process (WIP) at actual cost
  - Variance calculation
  - Settlement
Product Cost by Period in Order-Related Production, Contents III

- Repetitive Manufacturing
- Cost object hierarchy
  - Cost object hierarchy without distribution of actual costs
  - Cost object hierarchy with distribution of actual costs
- Addendum: Material Valuation
Unit Objectives

At the conclusion of this unit, you will be able to:

- Explain the use of product cost collectors and production orders as cost objects
- Describe preliminary costing
- Analyze the results of simultaneous costing
- Explain how work in process and cost variances are determined
- Explain the cost object controlling parameters for repetitive manufacturing
- Explain the use of cost object hierarchies
The production type is make-to-stock. The costs of sales orders are analyzed only in Profitability Analysis (CO-PA).

Pumps are manufactured both in a repetitive manufacturing environment and on the basis of production orders.

90% of the pumps are produced in series in an automated process controlled by R/3. 10% of the pumps are manufactured on the basis of production orders.

The pump has a production version for repetitive manufacturing and another production version for order-related production.

In this example, we will mainly look at the production process that uses production orders.
The information requirements in Cost Object Controlling are supported by interactive top-down reporting techniques. The information necessary for decision making is provided for the specific level at which business analysis required, such as product groups, product levels, or orders. You can branch to object lists from the individual summarization levels.

A typical path of analysis is to access plant data from an object list. For example, you can use order selection to generate a list of all orders that fulfill certain conditions (such as all orders for which the production variances exceed 10% in a particular plant for a particular material). From the list, you can access detailed reports for the individual orders.

The information system is discussed in detail in a separate unit.
Road Map: Product Cost by Period

- Master data
  - Product cost collectors
  - Production processes
  - Production orders

- Preliminary costing
  - Material costs
  - Production costs
  - Overhead, process costs

- Simultaneous costing
  - Goods movements
  - Confirmation

- Period-end closing
Actual costs can occur as a result of postings in Materials Management, Production Planning, Controlling, and Financial Accounting.

- You post confirmations, goods issues and goods receipts with reference to the production order. You configure the orders such that these costs are assigned to the product cost collector automatically.
- You can assign other costs, such as process costs or material overhead, directly to the product cost collector. All period closing functions are performed with reference to the product cost collector.

The periodic actual costs can be divided into:

- The costs for those products for which a goods receipt to the warehouse has been made in the period.
- The costs for the work in process. These are the target costs for the production quantities that have been confirmed for production operations, but for which as yet no goods receipt has taken place.
- Variances calculated using the following formula: Variances = actual debit - goods receipt - work in progress.

At the end of the period, work in progress and variances for each product cost collector are determined and periodically settled.
Product cost collectors are created without reference to a production environment. This means that you can collect actual costs on a product cost collector in the following environments:

- Order-related production (that is, when you use production orders).
- Process manufacturing (that is, when you use process orders).
- Repetitive manufacturing. In repetitive manufacturing, the cost object is always a product cost collector. This also applies to kanban production methods.

In mass production environments based on sales orders when you are using valuated sales order stocks, and in repetitive manufacturing when you are producing individual requirements materials (this scenario is described in AC 515 Product Cost by Sales Order).
In the *Product Cost by Period* component, costs are collected and analyzed on product cost collectors. Production orders do not serve as cost objects; they are used only for logistical processing.

In order to have the costs of a manufacturing order be collected on a product cost collector, you must make the necessary settings for the order type of the manufacturing order in Customizing for *Product Cost by Order* under the default values for order types.

You must manually create a product cost collector before you start production. When the manufacturing order is created, it is linked to the product cost collector automatically.

If you neglect to create a product cost collector, the costs are collected on the manufacturing order. In this case it is still possible to link the manufacturing order to the product cost collector as long as no actual costs have been updated to the manufacturing order.

Note on terminology: This course often uses the term *manufacturing order*. This is an umbrella term for *production order* and *process order*. 
The production order is assigned to the product cost collector through the production process. The system generates the production process automatically when the product cost collector is created.

Product cost collectors are linked to manufacturing orders and to the production versions in repetitive manufacturing in the same way.

Manufacturing orders that are linked to product cost collectors receive the status PCC.
The production process has characteristics whose values are unique to that production process. You specify which characteristics are updated for the production process by means of the Controlling level.

There is a separate Controlling level for each plant material and process category. The relevant process category in Cost Object Controlling is production.

The Controlling level you select when you create a product cost collector determines the level at which the costs are collected:

- Production versions
- BOM/routing combinations
- The material.
### Characteristics for Production Process

- **If you are using the Controlling level Production Version**, the product cost collector is created for the characteristics material/production plant/planning plant/production version. SAP recommends this Controlling level whenever you are using production versions. In repetitive manufacturing, you should always use this Controlling level.

- **If you are using the Controlling level BOM/Routing**, the product cost collector is created for the characteristics material/production plant/planning plant/BOM/routing. The Controlling level Production: BOM/Routing should only be used if the material does not have any production versions. The BOM is identified through the BOM usage and the alternative BOM. The routing is identified through the task list type, task list group.

- **If you are using the Controlling level Production Plant/Planning Plant**, the product cost collector is created for the characteristics material/production plant/planning plant. These product cost collectors have a number of special features. For example, it is not possible to create a preliminary cost estimate for the product cost collector. This affects subsequent functions. For instance, problems may arise if you make changes to the reporting points of the production versions.
## Product Cost Collector: Default Values for Order Type

### Default Values for Order Costing

<table>
<thead>
<tr>
<th>Plant</th>
<th>1000</th>
<th>Order type</th>
<th>RM01</th>
<th>Product cost collector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default rule</td>
<td>STR</td>
<td>(strategy for tracing factor determination)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RA key</td>
<td>FERT-P</td>
<td>WIP calculation at target costs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prel./vers. cstk</td>
<td>PREM</td>
<td>Preliminary costing, cost collector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Val. var.</td>
<td>006</td>
<td>Production order - planned</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simul. costing</td>
<td>PPP3</td>
<td>Product cost collector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Val. var.</td>
<td>007</td>
<td>Production order - actual</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A product cost collector is an order. The order type of the product cost collector must belong to order category 05 (product cost collector).

For product cost collectors, default rule STR (strategy for tracing factor determination) is specified in the order type. This default rule is linked to settlement type PER (periodic). As a result, the settlement rule for the product cost collector receives settlement type PER. Default rule STR also ensures that the values to be settled from a product cost collector can be distributed. This is necessary for example when the product cost collector collects the costs of materials that have different valuation types (such as special batch inventories) or that are part of a valued sales order inventory. When the product cost collector is settled, the system apportions the balance among the different inventories in accordance with the delivery values for the period. The settlement process generates the distribution rule automatically on the basis of the delivery values. The system creates equivalence numbers based on the delivery values, and transfers these equivalence numbers into the dynamic distribution rule.

A results analysis key must be specified in all product cost collectors for which you want to determine work in process.

For preliminary costing and simultaneous costing, you enter the costing variant and the valuation variant in the order type. This defines the valuation procedure for materials, internal activities, external activities, and business processes. It also determines which overhead structure is used to calculate overhead.

The default values for the order type are transferred into the product cost collector when it is created.
If a manufacturing order is assigned to a product cost collector, the status PCC will be assigned to the manufacturing order.

It is possible to calculate the planned cost of the manufacturing order, however, the results of the planned cost estimate cannot be saved.
Default rule PP2 (periodic) must be specified for the order type of the production order.

The costing variant and valuation variant specified in the order type for the production order are used for the preliminary cost estimate for the production order (this cost estimate is for information purposes only). If you don’t want the system to create this cost estimate, you don’t need to enter the costing variant or valuation variant.

No results analysis key is specified in the order type because WIP is calculated on the product cost collector.
Road Map: Product Cost by Period

- Master data
  - Product cost collectors
  - Production processes
  - Production orders
- Preliminary costing
  - Material costs
  - Production costs
  - Overhead, process costs
- Simultaneous costing
  - Goods movements
  - Confirmation
- Period-end closing
  - ...

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You can create a preliminary cost estimate for a product cost collector. The preliminary cost estimate costs the quantity structure defined by the production process. If you are using the Controlling level Production Plant/Planning Plant, you cannot create a preliminary cost estimate for the product cost collector.

In repetitive manufacturing, the activity quantities determined in preliminary costing can be used as default values for the confirmations. This requires that you make the appropriate setting in Customizing in the repetitive manufacturing profile.

Target costs can be calculated on the basis of the preliminary cost estimate. These target costs can be used to:

- Determine the work in process value in the WIP calculation function
- Determine the production variances and value the scrap variances in the variance calculation function

In repetitive manufacturing, if the reporting point structure of your routing changes, you can update the preliminary cost estimate to convert the quantities confirmed at the reporting points to the new reporting point structure.
In preliminary costing, the BOM components and activities are valuated using the valuation variant specified in the costing variant. The system calculates the overhead expenses using the costing sheet specified in the valuation variant.

The preliminary cost estimate of product cost collectors generates a cost component split and an itemization. The cost component split is not a true cost component split because it only has a single-level structure. This means that the assemblies used in the finished product are not exploded. Instead, the total value of the assembly is updated using the cost component to which the cost element of the assembly is assigned.

If the controlling area currency is not the same as the company code currency, the costs are updated in both currencies. You can see both currencies in the reports of the Product Cost Controlling Information System.

To view the costing results, access the cost estimate from the product cost collector, or go to the information system of Product Cost Planning.
To calculate direct materials costs, the input quantities of the materials determined by the BOM are multiplied by the prices selected through the valuation variant.

The system uses the BOM of the production process.

You have already specified which costing variant and valuation variant is used by the preliminary cost estimate in Customizing in the default values for the order type of the product cost collector.
To calculate the direct costs of production, the system multiplies the planned setup times, machine times, and labor times by the prices selected in accordance with the valuation variant.

The system uses the routing of the production process.

The standard values are specified in the operations in the routing and can be defined as either fixed or variable (lot-size-dependent) values.

- Lot-size-dependent standard values (such as labor and machine time) are multiplied by the lot size and divided by the base quantity on which the standard values are based.
- Fixed standard values (such as setup costs) can still behave as stepped costs for technical reasons (such as a tool change required above a certain order quantity). Such costs are called ordering costs.

The exact algorithm is stored in formulas for the work center which is assigned to the individual operations of the routing. The cost center and the activity type for each operation are in turn assigned to the work center. This determines the price of the activity.
The process template is determined dynamically based on the following parameters:

- The costing sheet determines the conditions for conventional overhead calculation and is selected through the valuation variant. This link means that process costs should be calculated in addition to conventional overhead.
- The overhead key is entered directly through an overhead group that is specified in the costing view of the material master record.
- Through the combination of overhead key and costing sheet you can select a template in dependency on the material object.
- You must specify the environment (such as material cost estimate or Cost Object Controlling) in which the template can be used.
Costs that cannot be assigned to the product cost collector directly can be allocated by determining the overhead expenses and applying them to the cost collector. You can define both quantity-based and percentage overhead rates.

The overhead is calculated using an overhead costing sheet. The costing sheet consists of three types of rows:

- **Base rows**: Here you enter the cost element groups, cost elements, or cost elements and origin groups to which you want to apply overhead in the same manner.

- **Overhead rate rows**: Here you specify the overhead rates to be used to apply overhead to the base rows.

- **Credit rows**: Here you specify which cost center (or internal order, or process) is credited, and with which cost element.

If you want to apply overhead in different ways depending on the material being manufactured, you can use overhead keys. You then define overhead rates based on the overhead keys, and link the overhead keys to overhead groups. You enter the overhead group in the material master record.

In preliminary costing for the product cost collector, the system uses the costing sheet specified in the planned valuation variant. In simultaneous costing for the product cost collector, the system uses the costing sheet specified in the actual valuation variant. This is the costing sheet that is displayed in the product cost collector.
Road Map: Product Cost by Period

- Master data
  - Product cost collector
  - Production process
  - Production order
- Preliminary costing
  - Material costs
  - Production costs
  - Overhead, process costs
- Simultaneous costing
  - Goods movements
  - Confirmations
- Period-end closing
  - ...
The following business transactions can result in actual costs on cost objects: G/L account postings in FI; goods movements in MM; repostings of primary costs; repostings of line items; internal activity allocations; repostings of internal activity allocations; direct assignment of personnel costs to cost objects by means of time sheets; process cost allocation; manual process allocation; template allocation; calculation of overhead; revaluation of activities at actual prices; confirmations in Logistics that result in activity allocations; subcontracting.

Logistical functions such as goods issues and confirmations are still performed with reference to the manufacturing order (or, in repetitive manufacturing, with reference to the production version). The resulting costs are updated to the product cost collector.

You can enter goods issues, confirmations, and goods receipts independently of each other. You can also have activity allocations and goods issues and/or goods receipts generated automatically when you confirm. You make the settings that enable this in Logistics.

You can confirm the order header or individual operations. In Product Cost by Period, it is recommended that you confirm operations (affects the calculation of work in process).
The price control of the material is specified in the material master record:

- Price control indicator V: The material is valuated at the moving average price. The moving average price changes with each goods movement or when orders from Cost Object Controlling are settled. The value of the goods receipt is determined by the valuation variant for delivery.

- Price control indicator S: The material is valuated at the standard price. In make-to-stock production, this price is usually calculated in a standard cost estimate for the material. In sales-order-related production with a valuated sales order stock, the standard price is selected using a predefined valuation strategy. For detailed information, refer to the course AC 515 Product Cost by Sales Order.

For materials whose price control is S, receipts into inventory are valuated at the standard price. The credit applied to the product cost collector is the quantity received into inventory multiplied by the standard price. For materials whose price control indicator is V, the receipt into inventory and the credit to the product cost collector is controlled by the valuation variant for delivery. The valuation variant for delivery determines which price field from the material master is selected to value the goods receipt. When the product cost collector is settled at the end of the period, the postings for materials with price control indicator S can differ from those for materials with price control indicator V (see: “Addendum: Material Valuation”).

When the goods receipt is entered, the system automatically debits the inventory account and credits the inventory change account. The product cost collector is credited using the primary cost element that corresponds to the plant activity account (inventory change account).

For internally manufactured materials, SAP recommends valuation at the standard price.
Road Map: Product Cost by Period

- Overhead, process costs
- Simultaneous costing
  - Goods movements
  - Confirmation
- Period-end closing
  - Work in process
  - Variances
  - Settlement
- Repetitive Manufacturing
- Cost object hierarchies
  - Without distribution of actual costs
  - With distribution of actual costs
- Addendum: Material Valuation

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Production Order and Product Cost Collector: Process Chain

- Settlement
- Preliminary Costing
- Simultaneous Costing
- Period-End Closing
- Process Cost Allocation
- Revaluation at Actual Prices
- Archiving, Deletion
- Order Creation
- Schedule
- Confirmation
- Goods Receipt
- Availability Check
- Release of Order
- Material Withdrawal
- Work in Process
- Overhead Allocation
- Variances
- Tgt, Act, WIP, Var.
Functions in the period-end closing process for product cost collectors:

- Template allocation for automatic allocation of process costs and activity types.
- Revaluation, at actual prices, of activity types and business processes with which cost objects were debited.
- Calculation of overhead expenses.
- Calculation of work in process: In Product Cost by Period, the work in process is valued at target cost.
- Variance calculation: The variance calculation function investigates the causes of the balance on the order. This function provides answers to questions such as: Why did the production process cost more than anticipated?
- Settlement
  - The work in process is settled to Financial Accounting and Profit Center Accounting.
  - The balance on the order is settled to Financial Accounting, Actual Costing/Material Ledger, and Profit Center Accounting.
  - The variance categories are settled to Profitability Analysis.
- The Schedule Manager simplifies the period-end closing process. This function is described in detail elsewhere.
You can have the system allocate the process costs to the product cost collector automatically during the period-end closing process.

To do this, you must define a template for this example and assign to it the function ORDER_TARGET_PROCESS_QUANTITY to calculate the actual process quantity. In this function, the target costs of the process are calculated on the basis of the current standard costs.

You can also use template allocation to allocate activity types to cost objects.
You can determine the actual prices for activity types and business processes at the end of the period. The actual prices are the actual costs divided by the quantities consumed.

You control whether revaluation at actual prices is possible in Customizing in the parameters for the actual version that depend on the fiscal year. In addition, you specify whether revaluation at actual prices takes place separately for each activity type.

You calculate actual prices in Overhead Cost Controlling.

Revaluation at actual prices is performed in the period-end closing process for the product cost collector. The cost object is charged with the difference between the actual price and the price originally allocated to it.

You can revaluate activities and business processes at actual prices in the following components:

- In Cost Object Controlling, for all cost objects (product cost collectors; production orders and process orders if they are being used as cost objects; sales order items; internal orders; cost object hierarchies; general cost objects).
- In the Project System (projects, WBS elements, networks, network operations).
Revaluation at Actual Prices (2)

**Activity Type**

**Cost Center**

4230

**Product Cost Collector**

**Planned Price Calculation**

<table>
<thead>
<tr>
<th>Cost</th>
<th>Hours</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>100.00</td>
<td>10</td>
<td>10.00 / hr</td>
</tr>
</tbody>
</table>

- Planned credit 100.00
- Actual credit 90.00
- Actual cost 117.00

**Actual Price Calculation**

<table>
<thead>
<tr>
<th>Cost</th>
<th>Hours</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>117.00</td>
<td>9</td>
<td>13.00 / hr</td>
</tr>
</tbody>
</table>

- Target credit 13 x 9 = 117.00
- Output price variance 27.00

**Preliminary Cost Estimate**

10 hours x 10.00 = 100.00

**Actual Debit at Planned Price**

9 hours x 10.00 = 90.00

**Subsequent debit 27.00**

**Actual Debit at Actual Price**

9 hours x 13.00 = 117.00

In this example, the planned cost center cost differs from the actual cost. The planned price is 10.00 per hour. However, only 9 hours were allocated instead of the 10 that were planned in the preliminary cost estimate. At the planned price, this results in 90.00 being allocated to the product cost collector.

At the end of the period, the total activity-related cost at the cost center is determined to be 117.00. At 9 allocated hours, this results in a target price of 13.00 per hour. Therefore, 9 x 13.00 = 117.00 should be charged to the cost object. The difference of 27.00 is charged to the product cost collector with the revaluation at actual prices function.

In this example, revaluation at actual prices is illustrated using an activity type. It also applies to business processes.
Actual overhead calculation allocates cost objects with actual overhead.

Overhead is allocated to cost objects using quantity-based or percentage allocation rates.

You can simulate overhead allocation (test run).

The overhead calculation process generates the following postings:

- Overhead expenses are charged to the cost objects (product cost collectors, manufacturing orders, or general cost objects).
- The cost center (or the order or process) is credited.

The costs are updated using the secondary cost elements specified in the credit rows in the costing sheet.

Actual overhead calculation uses the costing sheet entered in the product cost collector.
Calculating the WIP means valuating the unfinished goods (work in process).

In Product Cost by Period, work in process is valuated at target cost. The operation quantities confirmed for the manufacturing orders or production versions are valuated at the target cost of the operation provided that the quantities are not scrap and no goods receipt has been entered.

You specify which cost estimate the system uses to calculate target costs in Customizing in the valuation variant for work in process and scrap. If you are using a product cost collector, in many cases it is appropriate to calculate the target costs using the preliminary cost estimate for the product cost collector.

The difference between the work in process in the current period and the work in process in the previous period corresponds to the inventory change of unfinished goods and is transferred to financial accounting when you settle.
You can specify a valuation variant for the valuation of work in process and scrap variances at target costs.

Target costs can be calculated on the basis of:

- Planned costs (that is, the costs calculated in a preliminary cost estimate for the manufacturing order or in a preliminary cost estimate for the product cost collector).
- An alternative material cost estimate (such as a modified standard cost estimate or a current cost estimate). You specify the costing variant and the costing version so that the system can identify the cost estimate.
- The current standard cost estimate

You assign a valuation variant for work in process and scrap to the combination of controlling area, results analysis version, and results analysis key.

The only results analysis keys that are relevant are those used for the calculation of work in process at target costs.
You assign the following cost elements to line IDs:

- All cost elements with which an order is debited and credited
- With work in process at target costs, all cost elements in the cost estimate used for the calculation of target costs for the valuation of work in process (such as all cost elements listed in the preliminary cost estimate for the product cost collector).
  - For valuation-relevant costs (such as direct materials costs), you must create line IDs of category K (costs).
  - If you want no work in process to be created for entire line IDs (for example, because the costs are accrued), you must assign these line IDs to category N (not included).

The line IDs break down the costs incurred for the order into direct materials costs, direct production costs, material overhead, and so on. These groups can be based on the structure of the cost of goods manufactured in the cost component structure (cost component split), for example. You can specify a percentage that cannot be capitalized separately for each line ID.

You can mask your entries. The entry 00004+++++ includes the cost elements from 400000 to 499999. If you want particular cost elements to be treated separately, enter them unmasked (example: 0000415000).
In this step you specify which results analysis cost element should be used to update the work in process. You specify this separately for each line ID. You also assign each line ID to a category.

The category designates the cost elements under which the costs of the cost estimate used as the basis for target cost calculation are updated as relevant or not relevant for WIP calculation.

- For valuation-relevant costs (such as direct materials costs), you must create line IDs of category K (costs).
- If you want no work in process to be created for entire line IDs (for example, because the costs are accrued), you must assign these line IDs to category N (not included).
In this step you specify which G/L accounts in Financial Accounting the work in process is settled to. You can assign the work in process to the FI accounts:

- By results analysis category: In many cases it will be sufficient to generate a posting rule for the work in process with a requirement to capitalize (category WIPR).
- By results analysis cost element

You assign a balance sheet account and an account of the income statement to each results analysis category (such as each results analysis cost element). You cannot create cost elements in CO for the G/L accounts that you specify in the posting rules.

When the work in process is settled, a posting document is generated in FI. When the system capitalizes the work in process, it debits Unfinished Goods Inventory (WIP) (balance sheet account) and credits Changes in Unfinished Goods Inventory (WIP) (income statement account).

If you have specified a profit center in the product cost collector, data is also transferred to Profit Center Accounting.
The variances are calculated and updated for each product cost collector. The variance calculation process compares target costs with control costs.

The variance calculation process is designed to determine how the order balance arose. (The order balance is the difference between the debit and credit of product cost collectors.) For this reason you use target cost version 0 for variance calculation.

Variance calculation is the basis of detailed target/actual comparisons.

The variance calculation function provides answers to questions such as: Why did the production process cost more than anticipated? The variance calculation process identifies the causes of variances and assigns them to variance categories.
In variance calculation, target cost versions are used mainly to control the type of variance (total variance, production variance, or planning variance). They can also be used to valuate the scrap variances. The standard system uses the following target cost versions:

- Target cost version 0 (total variance). The total variance equals the order balance. For this version, choose actual costs as the control costs and standard cost estimate as the target costs.

- Target cost version 1 (production variance). For this version, choose actual costs as the control costs and planned costs as the target costs.

- Target cost version 2 (planning variance). With target cost version 2, the costs in the preliminary order cost estimate are interpreted as control costs. For this version, choose planned costs as the control costs and current standard cost estimate as the target costs. You cannot calculate planning variances for product cost collectors.

- Target cost version 3 (production variance of the period). You compare the planned costs of the period calculated on the basis of an alternative material cost estimate (such as a modified standard cost estimate) with the actual costs of the period on the basis of the yield delivered to inventory in the period. The base quantity for variance calculation is the yield. For this version, choose actual costs as the control costs and alternative material cost estimate as the target costs.

In Product Cost by Period, WIP and scrap variances are always deducted from the actual costs.
Variance Calculation: Variance Categories

- **Input price variance**: Raw material 1 was valued at 10 in the standard cost estimate. When the material was withdrawn from inventory, however, the goods movement was valued at 11 (the price control specifies that valuation is at the moving average price). This results in a price variance of 1.

- **Input quantity variance**: Machine time of 15 minutes was planned, but 17 minutes were confirmed. The activity price for the machine time is 5 per minute. This results in a quantity variance of 10.

- **Resource-usage variance**: Raw material 2 was used instead of raw material 1. The costs for both raw materials are reported as resource-usage variances.

- **Remaining input variance**: Because the price for material 1 changed, the material overhead is higher than planned. The difference between the planned and actual material overhead expense is reported as a remaining input variance.

- **Variance on the output side**: The material is delivered to inventory not at the standard price but at another price (such as the MAP price). The difference is classified as an output price variance.

- **Remaining variance**: If the system cannot determine the target costs, it will report only remaining variances.
Addendum: Assembly Scrap and Operation Scrap

Assembly Scrap
- Percentage of an assembly that does not meet defined quality standards.
- Example: If the assembly scrap rate is 25% and the required yield is 100 units, production must start with 125 units.

Operation Scrap
- Percentage output of an operation that does not meet defined quality standards.
- Example: If the operation scrap rate is 20% and the operation quantity is 125 units, 20% or 25 units will be scrap.

Operation Scrap Determines Assembly Scrap

\[
1 + \text{Assembly scrap} = \frac{1}{1 - \text{Operation scrap operation 10}} \times \frac{1}{1 - \text{Operation scrap operation 20}} \times \cdots
\]
The planned scrap rate reflects the planned material requirements and the planned internal activities, and is included in the standard cost estimate of the material.

Component scrap refers to materials that are faulty before they enter the production process. Component scrap increases the quantity of input materials. Planned component scrap is taken into account in the standard cost estimate and therefore affects the standard price. Variances in the actuals are considered input quantity variances.

Planned operation scrap is the scrap that is expected to be incurred in an operation.

Assembly scrap can be calculated by the system on the basis of the operation scrap. Like component scrap, assembly scrap increases the quantity of the input materials. Assembly scrap also increases the planned order quantity. For example, if the assembly scrap for a material is 56.25% and you create a production order for the material with a planned order quantity of 100 units, the system increases the planned order quantity to 156.25.

If you don’t want the assembly scrap to affect the input quantities of certain input materials, set the Net indicator in the BOM for these materials and enter the operation scrap in the BOM.
The scrap variance is the value of the scrap variance quantity. The scrap variance quantity is the difference between the target scrap quantity (planned scrap quantity converted to yield) and the actual scrap quantity (confirmed scrap quantity).

The scrap variance quantity is valuated at target cost less planned scrap cost.

Calculation of target scrap quantity: 850 units = 80% (yield), 20% scrap = x
Therefore: (850 x 0.2) 0.8 = 212.5.
### Itemization for Material: Pump
Lot size 1000 kg

<table>
<thead>
<tr>
<th>Op.</th>
<th>Item</th>
<th>Input Qty</th>
<th>Total Cost</th>
<th>Scrap Qty for Oper.</th>
<th>Plan Costs for Scrap</th>
<th>Component Scrap Qty</th>
<th>Costs for Comp. Scrap</th>
<th>Net Target Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0010</td>
<td>Painting</td>
<td>1562 h</td>
<td>1562</td>
<td>562</td>
<td>562</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>0010</td>
<td>100-100</td>
<td>1578 kg</td>
<td>1578</td>
<td>562</td>
<td>562</td>
<td>16</td>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>0020</td>
<td>Assembly</td>
<td>1250 h</td>
<td>1250</td>
<td>250</td>
<td>250</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>0020</td>
<td>100-300</td>
<td>1250 kg</td>
<td>1250</td>
<td>250</td>
<td>250</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

**Plan Costs for Scrap:**

- **Net Target Cost for Painting:**
  \[
  \frac{1562 - 562}{1000} = 1
  \]

- **Net Target Cost for 100-100:**
  \[
  \frac{1578 - 562 - 16}{1000} = 1
  \]

### Scrap Variance Quantity

<table>
<thead>
<tr>
<th>Op.</th>
<th>Item</th>
<th>Net Target Cost</th>
<th>Value of Scrap Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>0010</td>
<td>Painting</td>
<td>1</td>
<td>87.5</td>
</tr>
<tr>
<td>0010</td>
<td>100-100</td>
<td>1</td>
<td>87.5</td>
</tr>
<tr>
<td>0020</td>
<td>Assembly</td>
<td>1</td>
<td>87.5</td>
</tr>
<tr>
<td>0010</td>
<td>100-300</td>
<td>1</td>
<td>87.5</td>
</tr>
</tbody>
</table>
Lot size variances can be calculated for all target cost versions that report variances on the output side.

Lot size variances are calculated in the following formula:

- Lot size variance = Lot-size-independent target costs x (1 – Control quantity / Planned quantity).

Lot size variances are only calculated if the planned quantity does not equal the confirmed quantity (the delivered quantity).

In this example, the costs that are independent of the lot size (such as the setup and teardown costs) are 40 per unit.

- Example: The standard price for one finished product as calculated in the standard cost estimate is 120.

- The costs for 10 units of finished product delivered to inventory in the period were updated to the product cost collector. The actual cost is 840. The goods receipts are valued at 1,200 (quantity delivered to inventory multiplied by the standard price as calculated in the standard cost estimate).

- The target costs, however, are 10 x 40 for material, 10 x 40 for internal activities, and 1 x 40 for setup = 840. The difference between the target cost and the credit is the lot size variance.
If you want to perform mixed costing in Product Cost Planning, you must create a procurement alternative for each production version and then define a mixing ratio. The mixed cost estimate calculates a mixed price. This price can be written to the material master as the standard price.

Mixed-price variances arise when the system valuates the inventories on the basis of the mixed price of the material. The mixed-price variance results from the difference between the target credit (actual quantity x standard cost of procurement alternative) determined in the variance calculation process and the actual credit posted at the time of the goods receipt (actual quantity x standard price). The standard price equals the mixed price.

If you have not activated the field mixed-price variance in the variance variant, mixed-price variances are reported as output price variances.
You always enter the valuation variant for scrap in target cost version 0. Even if you calculate variances in a different target cost version (such as target cost version 1), the scrap variance may be valuated with the valuation variant specified in target cost version 0.

You normally use the same valuation variant for the valuation of work in process at target costs and for the valuation of scrap variances.

In the variance variant, you specify which variance categories you want the system to report. You link the variance variant to the target cost version.

If you want a cost object to be included in the variance calculation process, a variance key must be specified in that cost object. You specify the variance key in the costing view of the material master record; it is transferred from there into the product cost collector (in Product Cost by Order, it is transferred into the manufacturing order). You can specify the variance key as a plant-based default value in Customizing for Product Cost by Period or Product Cost by Order. The variance key is then transferred into all material master records created in the plant in question.
If the price control indicator is set to $S$, settlement debits the price difference account and credits the inventory change account. The amount posted is the total variance.

If the price control indicator is set to $V$, settlement debits the inventory account and credits the inventory change account.

Settlement also transfers the work in process to Financial Accounting.

The value of the total variance and the work in process can also be transferred to Profit Center Accounting.

The value of the total variance is transferred to the application component Actual Costing/Material Ledger (if active).

You can settle the variance categories to costing-based profitability analysis (CO-PA). The only variances that are relevant for settlement to Profitability Analysis are those calculated on the basis of target cost version 0. You settle the variances to costing-based profitability analysis by variance category and cost element group. You assign the variance categories to value fields in Profitability Analysis.

If the price difference account has a corresponding cost element, the price difference is settled to account-based profitability analysis in a similar way as to Financial Accounting.
The settlement profile for a product cost collector must allow settlement to a material. If you want to settle variances to Profitability Analysis, the Variances indicator must be selected and settlement to a profitability segment must be allowed.

The settlement profile is defaulted through the order type of the product cost collector.

The settlement profile also has fields for the allocation structure and the PA transfer structure. These structures control settlement to costing-based profitability analysis.

In the settlement structure, you indicate whether you want to settle with source cost elements or with settlement cost elements.
In the PA transfer structure, you specify which variance category and cost element group are assigned to which value field in Profitability Analysis. This is called PA transfer structure assignment.

Values and quantities must be transferred into separate value fields. It is possible to assign only fixed values or only variable values (Fixed/variable indicator). The values can also be transferred as a sum (Fixed/variable indicator = 3).
Road Map: Product Cost by Period

- Overhead, process costs
- Simultaneous costing
  - Goods movements
  - Confirmation
- Period-end closing
  - Work in process
  - Variances
  - Settlement
- Repetitive Manufacturing
- Cost object hierarchies
  - Without distribution of actual costs
  - With distribution of actual costs
- Addendum: Material Valuation
Repetitive manufacturing refers to production planning and control without the use of production orders.

The planned requirements for repetitive manufacturing are normally generated automatically by material requirements planning (MRP), although they can also be created manually. Production planning and control uses the planned orders for capacity planning and scheduling.

The goals of repetitive manufacturing are the following:

- Creation and revision of production quantities on a period and quantity basis (reduction in individual lot and order-specific processing).
- Reduction in the production control effort and simpler backflushing tools (with the option of using the full scope of the PP functionality).
Cost object controlling is carried out for the controlling level of the material. With repetitive manufacturing, the controlling level is normally the production version or material.

- The production version(s) are created in the material master record. The production version requires a BOM and a task list (routing).
- Costs are recorded on a product.
There is specific master data required for Repetitive Manufacturing. This includes the repetitive manufacturing profile and the product cost collector.

The repetitive manufacturing profile is assigned in the MRP view of the master record of the material to be produced determines the following:

- Whether activities are backflushed
- Whether reporting points are used
- Whether a goods receipt is automatically posted when the last reporting point is confirmed

If you do not want to post any activities through reporting point confirmations, you can enter an internal activity allocation in the Controlling module and specify the product cost collector for the material (and production version, if necessary). In addition, you can assign the product cost collector to a cost object hierarchy, and post the activities to the relevant cost object node. During period end closing, the activity costs posted to the cost objects of the hierarchy can be distributed to the assigned product cost collectors.

If you want to calculate work in progress and scrap during period-end closing, you must record backflush quantities at the reporting points.

If the activities are to be backflushed, you define in the repetitive manufacturing profile if the standard cost estimate for the material or the preliminary cost estimate for the product cost collector should be used to determine the activity quantities for the backflush. The activity rate is determined by the actual valuation variant for the product cost collector.
Road Map: Product Cost by Period

- . . .
- Overhead, process costs

- Simultaneous costing
  - Goods movements
  - Confirmation

- Period-end closing
  - Work in process
  - Variances
  - Settlement

- Repetitive Manufacturing

- Cost object hierarchies
  - Without distribution of actual costs
  - With distribution of actual costs

- Addendum: Material Valuation
A cost object hierarchy can be used to analyze target costs, actual costs, and variances when you have costs that you cannot (or don’t want to) assign directly to orders (product cost collectors or periodically settled manufacturing orders). Examples of costs that cannot be assigned directly to orders are:

- Inventory differences.
- Overhead costs (power, maintenance, etc.), that can be attributed to a production line but not to individual orders.
- Input materials that can be assigned only to product groups and not to specific products (such as the milk required for manufacturing both milk chocolate and plain chocolate).

Costs for cost object nodes can be incurred through goods movements, G/L account postings, template allocations, and activity allocations. Overhead calculated on the basis of overhead rates also can be allocated to cost object nodes.

You can create cost object hierarchies at various levels, such as:

- Areas of responsibility (example: production lines).
- Product groups.
You can analyze the costs on the hierarchy level at which the actual costs were posted. This is appropriate when you only want to analyze the costs of product groups or areas of responsibility. In this case you do not distribute the actual costs.

Work in process is always determined at the level of the assigned orders.

Variances are determined at the level of the cost object nodes. For each node in the hierarchy, the system compares the actual costs with the target costs. If costs were updated using a given cost element to both a cost object node and the assigned orders, the system executes dynamic summarization and variances are reported for the highest node of the hierarchy at which costs were updated using that cost element.

Settlement through material account determination: The system settles all costs to the highest node of the cost object hierarchy, and from there to a price difference account. The price difference account is selected by means of automatic material account determination in MM (transaction key PRK; offsetting entry with transaction key KTR). Manual account assignment: The system settles the costs for each order to a price difference account selected by means of material account determination. The costs allocated to the cost object nodes are settled in accordance with settlement rules which you create manually. You must create a separate settlement rule for each cost object node.

You can settle the variances from the individual cost object nodes to Profitability Analysis. The system generates profitability segments as the receivers. The profitability segments are derived from the characteristics of the cost object nodes.
Distribution of actual costs: The costs allocated to the cost object nodes are distributed to the product cost collectors assigned to the cost object hierarchy. The variances are determined at the level of the product cost collectors. It is appropriate to distribute the actual costs when you are interested in analyzing the costs at the level of the assigned product cost collectors.

To distribute the actual costs, the system first determines the target cost for each cost element (or for each cost element, origin, and period) using the cost estimate specified in the target cost version and the quantity placed into inventory during the period. This determines the ratios between the orders. The ratios for actual cost distribution can be calculated on the basis of target cost version 0, 1 or 3.

The system then distributes the actual costs to the product cost collectors using these ratios. Actual costs that cannot be assigned to a cost element on a product cost collector are assigned to a cost element group. You should therefore assign a cost element group to the target cost version.

The distributed actual costs are updated to the product cost collectors assigned to the cost object hierarchy. These costs are included in the period-end closing process for these product cost collectors.
After you have distributed the costs, you calculate the variances for the orders assigned to the cost object hierarchy and settle the orders in period-end closing for the orders. If you wish, you can perform these steps in period-end closing for the cost object hierarchy. Variances for the orders assigned to the cost object hierarchy, however, must be calculated in period-end closing for the cost object hierarchy.

After you have distributed the actual costs updated to the cost object nodes, you normally determine the overhead at the level of the product cost collectors assigned to the cost object hierarchy (and not at the level of the cost object nodes).

Work in process is always determined at the level of the assigned product cost collectors. Since work in process is calculated at target costs, distributed actual costs are not included as work in process. If you wish, you can calculate work in process in period-end closing for the cost object hierarchy.
Road Map: Product Cost by Period

- ... Overhead, process costs
- Simultaneous costing
  - Goods movements
  - Confirmation
- Period-end closing
  - Work in process
  - Variances
  - Settlement
- Repetitive Manufacturing
- Cost object hierarchies
  - Without distribution of actual costs
  - With distribution of actual costs
- Addendum: Material Valuation
Addendum: Material Valuation - Overview I

- **Valuation at standard price**
  - The standard price remains constant for one or more periods, often up to a year or longer.
  - The standard price is normally calculated in a standard cost estimate for the material.
  - The total inventory value is the total inventory quantity multiplied by the standard price.
  - The price control field in the material master record is set to S.

- The standard price remains valid for at least one period. The period is defined in *Materials Management* (MM).
Addendum: Material Valuation - Overview II

- **Valuation at the moving average price**
  - For externally procured materials, the moving average price is recalculated after every goods receipt and invoice receipt.
  - For internally manufactured materials, the moving average price is recalculated after every goods movement and each time an order is settled.
  - The moving average price is the total inventory value of the material divided by the total quantity in inventory.
  - The price control field in the material master record is set to V.

- **Valuation at the periodic unit price**
  - The periodic unit price is recalculated each time a period is closed.
  - The price control field in the material master record is set to S.

- For internally manufactured materials, you can define a valuation variant for the valuation of the goods receipts.
Addendum: Valuation of Materials at Standard Price

Advantages

- Standard cost accounting
- Analysis of the effects of changes in the production scenarios
- Allocation of variance categories to costing-based profitability analysis (CO-PA)

Disadvantages

- Inventories are valued consistently
- Products with widely fluctuating purchase prices or frequent changes in the production process should often be valued at actual cost

Therefore:
Valuation at standard price is only recommended for materials manufactured in-house.

- If the price control field in the material master record is set to S (standard price), a price difference account is debited with the difference between the actual debit and the actual credit (from goods receipts) of the product cost collector for the period.
- The material is not revaluated when the variances for the product cost collector are settled to FI. Settlement results in a new statistical moving average price being computed and transferred to the accounting view of the material master record.
- Settlement results in the following posting in FI: The price difference account is debited and the inventory change account is credited.
Addendum: Valuation of Materials at Moving Average Price

**Advantages**
- Variances caused by different purchase prices of externally procured materials are included in inventory valuation.
- Variances that arise during the production of materials are included in inventory valuation.

**Disadvantages**
- If material movements and order settlements overlap, the moving average price may be incorrect.
- Variances are not rolled up through the production structure.
- It is not possible to settle variance categories to CO-PA.

Therefore:
Valuation at moving average price is not recommended for materials manufactured in-house.

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- If the price control field in the material master record is set to V, the inventory account for the material is debited with the difference between the actual debit and the actual credit (from goods receipts) of the product cost collector for the period.
- When you settle the product cost collector, the moving average price and the total inventory value are recalculated and the result transferred into the accounting view of the material’s master record. The material is reevaluated, and a document for the revaluation is generated in FI.
- The following posting is made in FI:
  - The inventory account is debited and the inventory change account is credited.
- If the inventory quantity is equal to or greater than the quantity produced by the order, the full order balance is posted to the inventory account.
- If no goods were received into inventory during the period, the actual costs are settled to the price difference account. If the inventory quantity is less than the quantity received into inventory from the order, the system settles the difference to the price difference account.
- For information on the effects of the moving average price on internally manufactured materials, see the documentation in Cost Object Controlling.
Addendum: Valuation of Materials at Periodic Unit Price

- Combines the advantages of a standard cost system with an actual cost system
  - Preliminary valuation at standard price
  - Final valuation at periodic unit price
- Variances are rolled up through the production structure.
- Variance categories can be settled to CO-PA.
- The periodic unit price can be used for both externally procured materials and internally manufactured materials.
- The periodic unit price is calculated in the application component Actual Costing/Material Ledger.

- Material ledger data consists of valuation and control data for materials (with a valuation type if applicable) in a valuation area for a particular posting period. Material ledger data contains data for transactions in the system that are relevant to valuation. Examples of such transactions are goods receipts and the settlement of orders. This data is collected in the material ledger as the transactions are run.

- The material ledger data provides the basis for actual costing and enables valuation prices to be carried in multiple currencies and valuations. Material ledger data supplements the data in the material master records.

- The multilevel actual costing function determines the actual quantity structure using the transactions collected during the period, and valuates this structure with the prices from single-level material price determination. This process takes place across all manufacturing levels and enables you to assign follow-up costs to semifinished and finished products. The multilevel material price determination function valuates the inventories and consumption of the preceding posting period (MM) with the periodic unit price. The periodic unit price reflects the actual values of the previous period. The application component Actual Costing/Material Ledger then calculates the actual costs for the materials. Determination of the periodic unit price does not influence valuation in the current period.

- Detailed information on actual costing is provided in the course AC 530 Actual Costing/Material Ledger.
Summary

- *Product Cost by Period* is used in high-volume, stable manufacturing environments.
- *Product Cost by Period* analyzes the production costs for each period.
- Costs are collected on product cost collectors regardless of the production type. Product cost collectors are the central cost objects in *Product Cost by Period*.
- If there is more than one way to manufacture a product, you can collect the costs on production versions (or on BOM/routing combinations) by defining multiple product cost collectors for the material.
Exercises

Unit: Product Cost by Period using production orders
Topic: Master data and preliminary cost estimate

At the conclusion of this exercise, you will be able to:

- Create a product cost collector and production process
- Review the cost data for a product cost collector
- Analyze a preliminary cost estimate and display the customizing for the costing variant
- Create a production order, and display the control data that is provided by the product cost collector and production process
- Review the required components and operations that have been defaulted to the production order from the BOM and routing
- Display the customizing settings for the product cost collector and the order type parameters for a production order

The pump assembly T-F1## is a mature product with a stable manufacturing process that utilizes production orders. Your controlling department has determined that the preferred method of controlling for this product is to utilize the product cost collector in order to focus on product cost by period, rather than product cost by order.

You are a member of the controlling department, and have been asked to review the cost flow and analysis that is available for a product cost collector. To accomplish this, you will create a product cost collector for the pump, and analyze the cost data for the cost collector that determines the calculation of the preliminary cost estimate. In addition, it will also be necessary to create a production order and review the control data that is copied from the product cost collector to the production order.

Although all customizing has been completed, you will need to verify the settings for the order types and costing variants that are relevant for the product cost by period scenario.

1-1 To manage the cost object controlling for pump assembly T-F1##, a product cost collector must be created. The controlling level for the pump will be the BOM and routing.

1-1-1 Create a product cost collector for pump assembly T-F1##, using production plant 1000. The order type should be RM01. The product cost collector should be valid for a BOM and routing. While creating the cost collector, enter BOM usage 1, alternative 01, and search for a valid routing for material T-F1## in plant 1000. Save the product cost collector. Select yes when asked if you want to create a preliminary cost estimate.
1-1-2 Using the display transaction for the product cost collector, display the cost data. What cost data was assigned to the cost collector? What order type is assigned to the cost collector?
  Costing sheet:
  Overhead key:
  Results Analysis key:
  Variance key:
  Order type:
  Order number:
  Production process:

1-1-3 Record the planned costing variant and the actual costing variant for the product cost collector. A different costing variant is specified for the planned costs than for the actual costs. Why is this necessary?
  Planned Costing Variant:
  Actual Costing Variant:
  Why is this necessary:

1-2 A preliminary cost estimate was created for your product cost collector. Review the results of the cost estimate and display the customizing settings for the planned costing variant and order type RM01.

1-2-1 Display the preliminary cost estimate from the product cost collector. What are the costs of goods manufactured for 10 pieces?
  COGM:

1-2-2 Display the itemization report for T-F1##. Determine the calculated costs for the assembly T-B1##.
  Cost: ____________

1-2-3 Create another session. Display the current cost estimate for assembly T-F1##. Compare the preliminary cost estimate calculated for the product cost collector for assembly T-F1## with the current standard cost estimate for this material. Why can there be differences in these two prices?
  Standard: ____________

1-2-4 The planned costs were calculated using the costing variant PREM. In customizing, display the assignment of this costing variant to the order type RM01 defaults for plant 1000. From customizing, determine what costing variant is assigned for actual costs?

1-2-5 Display the customizing settings for the calculation of the planned material costs for the product cost collector. What valuation variant is assigned to calculate the planned order costs for costing variant PREM?

1-2-6 What type of costs are updated based on the costing type assigned to this costing variant?
1-2-7 What prices are selected for valuing the material components?
1-2-8 What price is selected for valuing the production activities?

1-3 Create a production order and analyze the connection to the production process and the product cost collector.

1-3-1 Create a production order for 10 pieces of material T-F1##, using production plant 1000, order type PP08. Use forward scheduling, and enter today’s date as the start date.

1-3-2 Access the Control Data for the production order. How were the Costing Variant for Actuals, Costing sheet and Overhead key determined for the production order? Can they be changed for the production order?

Answer:

1-3-3 What order status is related to the use of a product cost collector?

Answer:

1-3-4 Locate the production process on the Control data screen. Is this production process unique for this BOM and Routing, or is it valid for all production methods for this material and plant?

Answer:

1-3-5 From the assignment tab, determine which profit center has been assigned to the production order? Which master record determined the profit center?

Answer:

1-3-6 Go to the operations overview, and review the operations that have been selected for this production order. Which work center is assigned to operation 0010? What is the control key for this operation?

Answer:

1-3-7 Review the material components and verify the required quantity for each component. What are the required quantities of components T-B1## and T-B2##? Is there any planned scrap for these components?

Answer:

1-3-8 Release the production order.

1-3-9 Save the production order. Record the order number.

Order number ______________
The use of a product cost collector is dependent on the order type selected for the production order. Display the order type defaults for plant 1000, and order type PP08 and review the customizing settings.

1-4-1 Is the product cost collector indicator selected?
   Answer:

1-4-2 What is the default rule for the CO settlement.
   Answer:

1-4-3 If a product cost collector is found for a material, will the RA Key and Simultaneous Costing variant for order type PP08 default to the production order?
   Answer:
Exercises

Unit: Product Cost by Period using production orders

Topic: Posting Actual Costs

At the conclusion of this exercise, you will be able to:

- Analyze the actual costs for the usage of the components, to include unplanned material usage (component scrap)
- Analyze the actual production costs for the confirmation of production activities
- Analyze the actual cost for the receipt of the finished product
- Display the customizing settings for calculation of actual costs

Inventory transactions and production confirmations are utilized to record actual events against a production order. For the manufacturing of the pump assembly, the components are issued manually, via inventory management. If any components are scrapped during production, additional quantities are issued to the production order. In this manner, unplanned component scrap can be reported as a quantity variance during variance calculation. The production floor records the progress of a production order by utilizing order confirmations. During the confirmation, any changes to the expected execution times can be entered. This variance would also be recognized during variance calculation. Lastly, goods receipts can be processed either manually through inventory management, or automatically during the production confirmation, depending on the control key. For the manufacture of the pumps, the control key specifies an automatic goods receipt should be processed with the confirmation. During the production confirmation, it is also possible to report assembly scrap, which will be analyzed during variance analysis.

For the production of the pump assembly, you have been asked to execute a number of tasks that represent a common production order scenario.

1. Enter the goods issue for the components, via inventory management. During production however, some components have incurred scrap that was not anticipated. You will need to manually increase the issue quantity to reflect the loss due to the scrap.

2. Enter a production confirmation for operation 10. During operation 10, you will manually increase the execution time, to represent the additional time that was required due to the loss of the component. (Additional assembly time was necessary because the first attempt to assemble the item failed, which caused the component to be scrapped. The assembly then had to be processed again)
3. Enter a production confirmation for operation 60. Since the control key for this operation identifies automatic goods receipt, the inventory transaction to receive the finished pump into the warehouse will happen concurrently. In addition, an unplanned scrap quantity of 1 finished pump assembly will be recorded during the confirmation.

2-1 Since the production order has been released to the shop floor, inventory transactions and production confirmations can be posted against the order. This will cause actual costs to be recorded on the product cost collector.

2-1-1 Enter the goods issue for the material components reserved for the production order. Change the quantity of material component T-B1## from 10 to 11, due to material scrap that has occurred during assembly. Will this quantity change be reported as a variance?

2-1-2 Enter a final shop floor confirmation for operation 10 of the production order. Enter a yield of 10 pieces, and increase the labor time by a factor of 10%, to reflect the additional processing necessary because of the scrapped components. Save the confirmation.

2-1-3 Enter a partial shop floor confirmation for operation 60 of the production order. Enter a yield of 5 pieces and a scrap of 1 piece, and save the partial confirmation. Continue past the warning regarding the activity recalculation due to the partial confirmation. (Since the operation uses control key PP99, this is a milestone confirmation with an automatic goods receipt.)

2-2 Using the Planned/Actual Comparison report from the Product Cost Controlling by Period report tree, review the actual cost information for the product cost collector for T-F1## from the proceeding transactions.

2-2-1 Display the quantity of material T-B1## that was debited to the product cost collector. Display the activities that were debited to the product cost collector.

2-2-2 Locate the credit to the product cost collector for the delivery of T-F1##. Was the cost collector credited for the confirmation of the pump assembly that was reported as scrap?

Answer:

2-2-3 What value was used to credit the product cost collector for the delivery of the pump assembly? Why?

Answer:
The actual costs for the activities were calculated using the costing variant PPP3. Review the customizing settings for the calculation of the actual costs for the product cost collector.

2-3-1 Display the assignment of this costing variant to the order type RM01 defaults for plant 1000.

2-3-2 What valuation variant is assigned to calculate the actual order costs for costing variant PPP3?

Valuation variant:

2-3-3 What price is selected for valuing the production activities? Is this the same price that was selected for the valuation variant used to determine the planned costs, valuation variant 006?

Activity price selected for actual costs:

Activity price selected for planned costs:
Exercises

Unit: Product Cost by Period using production orders
Topic: Period end closing

At the conclusion of this exercise, you will be able to:

- Allocate process costs for the product cost collector and review the customizing settings for the determination of the process template
- Specify when the revaluation of activity prices would be appropriate for production orders
- Allocate overhead costs for the product cost collector, and review the customizing settings for the determination of the costing sheet
- Execute WIP calculation for the product cost collector, and analyze the result
- Display the customizing settings for the calculation of WIP at target cost
- Execute variance analysis for the product cost collector, and analyze the result
- Analyze the target cost for unplanned scrap of the finished product
- Execute settlement of the WIP balance and the variances to FI and PA.
- Review the customizing settings for the PA transfer structure

At period end, various transactions need to be executed to complete the cost allocations in Controlling, and to transfer information to FI and PA. The process cost and overhead cost allocations are necessary to post indirect costs to the product cost collector. The WIP balance needs to be calculated, so that it will be available to transfer the WIP inventory account balance to FI. The variance calculation is necessary to determine the category and value of the types of variances that occurred during the manufacturing process, to include the value of scrap. Lastly, the relevant information for WIP and variances are transferred to FI and PA during the settlement transaction.

As part of your production scenario, it will be necessary for you to execute these tasks. Since your controlling department has decided to use ABC to allocate order-handling costs, you will need to execute this transaction. In addition, indirect warehousing costs are passed through the overhead costing sheet, so it will be necessary to apply overhead costs to the product cost collector. After all actual costs have been applied to your product cost collector, it will be necessary to calculate WIP, so this value may be transferred to FI during settlement. Since product cost collectors are period based, the WIP will be valued at the target cost, not the remaining actual costs. In this way, period variances can be
recognized to FI and PA. The variance analysis will highlight the variances that occurred due to the excess material issue for the component materials, the additional execution time that was necessary for operation 0010, and the value of the scrapped pump assembly. This information can then be transferred to PA during the settlement transaction.

3-1 Complete the process cost allocation for the product cost collector for T-F1##.

3-1-1 Using the individual processing transaction for Process Cost Allocation, apply the actual process cost to the production order for version 0 of the current period.

3-1-2 From the detailed list display, determine the value of the process cost allocation. What are the total costs and quantity of processes for process 300900?

Answer:

3-1-3 Display the configuration settings for the determination of the process template. What process template is selected for the product cost collector?

Answer:

3-2 Please answer the following questions as either True or False.

3-2-1 System performance of period end closing activities such as revaluation of posted activities is improved with the use of product cost collectors, due to the reduced volume of cost objects as compared to product cost by order.

Answer:

3-2-2 The revaluation of activity prices can be used to support the valuation strategy of ‘Actual activity price of previous period’.

Answer:

3-2-3 The revaluation of activity prices should be executed after the allocation of process costs and overhead costs.

Answer:

3-3 Complete the calculation of the overhead costs for the product cost collector for T-F1##.

3-3-1 Using the individual processing transaction for Overhead Calculation, apply the overhead costs to the product cost collector for the current period.

3-3-2 From the detailed list display, determine the value of the overhead calculation. What are the total overhead costs? What cost center has been credited for the overhead allocation?

Answer:

3-3-3 Display the configuration settings for the determination of the overhead costing sheet. What costing sheet is assigned to the valuation variant for actual costs, valuation variant 007?

Answer:
3-4 The calculation of work in process is necessary to determine the current order balance for the product cost collector for T-F1##.

3-4-1 Using the individual processing transaction, calculate the Work in Process value for your product cost collector, using the current period and Results Analysis version 0.

3-4-2 From the WIP display, position the cursor in the WIP list on the product cost collector and access the detailed report by selecting the button WIP explanation.

3-4-3 Explode operation 0010. This should reflect the quantities confirmed from the previous transactions. 10 pieces of the pump assembly were confirmed at operation 0010. Then, 5 pieces were confirmed at operation 0060 and 1 additional piece was reported as scrap at operation 0060. This leaves a remaining WIP quantity of 4 pieces at operation 0010.

3-4-4 Remain in the WIP explanation report. Using a different R/3 session, display the preliminary cost estimate for the product cost collector. Change the cost display to 4 pieces, to match the WIP quantity.

3-4-5 Go to the itemization report. Change the display variant to view the costs by operations (grouped). Explode the summation rows for operation 0010. Compare the costs of the planned cost estimate with the calculated WIP. They should be identical, to include the process and overhead costs.

3-4-6 Leave the preliminary cost estimate for the product cost collector, and display the actual costs for the product cost collector. (Continue to display the WIP explanation report in the other session). Compare the calculated total WIP amount with the remaining balance for your production order. Are they the same value? Can you explain this?

Answer:

3-4-7 Continue to remain in the calculate WIP task. Display the WIP report. Record the amounts for the WIP categories. How are the WIP categories determined?

<table>
<thead>
<tr>
<th>WIP direct costs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>WIP overhead costs</td>
<td></td>
</tr>
<tr>
<td>WIP production costs</td>
<td></td>
</tr>
</tbody>
</table>

3-4-8 Using another R/3 session, review the configuration settings for the WIP calculation using results analysis key FERT-P. Determine the assignment of the valuation variant for WIP for Controlling area 1000, results analysis version 0, results analysis key FERT-P.

Valuation variant:

3-4-9 Verify the valuation variant for WIP and scrap is defined as using the plan costs/preliminary cost estimate as priority 1.

3-4-10 Display the configuration for posting the WIP balances to Financial Accounting for Controlling area 1000, Company code 1000, RA version 0.
Record the account numbers.

**WIPR:**  
P&L  
*Balance sheet*

**WIPP:**  
P&L  
*Balance sheet*

3-5 Using the individual processing transaction, execute variance analysis for your product cost collector. Calculate the variances for all target versions for the current period. Remain in the variance analysis list display to answer the following 3 questions.

3-5-1 From the list display, determine what amount was used to value the scrap. What configuration setting determines the basis for the scrap value calculation?

**Answer:**

3-5-2 Select *Cost elements*, and display the variance report.

3-5-3 Display the variance report for target cost version 1. What caused the variance for cost element 890000, T-B1##?

**Answer:**

3-6 After WIP and variances have been calculated, the variance categories can be settled to PA, and the WIP can be settled to FI.

3-6-1 Execute settlement for the product cost collector. Use the current period and year.

3-6-2 The system displays the basic list for the settlement. Display the detail list and access the settlement receiver of the variances. The system displays a list of the variance amounts for PA by variance categories, and for FI by material. Return to the detail list and select the accounting documents, and select the entry for Accounting document. What accounts were the postings made to?

**Answer:**

3-6-3 Return to the list of accounting documents, and access the Profitability analysis document. Check the settlement to the value fields according to the variance category. Which value field was the scrap settled to?

**Answer:**

3-6-4 Return to the detail list for the settlement, and display the sender and receiver information for the WIP accrual.

3-6-5 Return to the detail list for the settlement, and display the settlement rule. What method and settlement type are defined for the material settlement? What order type parameter controlled the settlement type default?

**Answer:**
3-6-6 From the settlement rule, display the settlement type parameters. What is the PA transfer structure?

PA transfer structure:

3-6-7 From customizing, display the assignment of the value field for the scrap variance category using PA transfer structure E1.
Exercises

Unit: Product Cost by Period using production orders

Topic: Cost Object Hierarchy

Optional Exercise

At the conclusion of this exercise, you will be able to:

- Create a cost object hierarchy, and display the customizing settings for the cost object category
- Enter actual activity allocations for the cost object hierarchy
- Distribute the costs from the cost object hierarchy to the production processes

Certain manufacturing costs cannot be directly allocated to a specific product cost collector or run schedule header. By using a cost object hierarchy, nodes can be constructed that represent the different production areas within a company.

In your company, assembly T-B4## has two different production versions that are assembled using repetitive manufacturing. Although each version incurs direct production costs using confirmations, there is an additional assembly team that supports the production requirements as needed, but does not track their time for each assembly line. In addition, their costs have not been recognized through an indirect cost allocation method, such as process costs or costing sheets. This assembly team reports the amount of time that has been provided to each cost object node. Their labor charges are then distributed to the product cost collectors based on the target cost for each version.

You have been asked to test this process, to include building a cost object hierarchy, assigning the production processes for each production version to the node, and confirming actual production quantities. Then, you will enter an activity allocation to the cost object node for the labor costs of the assembly team. These labor costs will then be distributed from the cost object node to the production processes based on the target cost.
4-1  The Production Processes need to be assigned to the correct node of the cost object hierarchy. These production processes will be created automatically via the product cost collector. For the assembly T-B4##, we will create the product cost collectors using the naming convention for production version.

4-1-1 Create two product cost collectors for pump assembly T-B4##, using production plant 1000. Create a separate product cost collector for each production version; 0001 and 0002. The order type should be RM01. Save each product cost collector. Select yes when asked if you want to create a preliminary cost estimate. Accept the default lot size for version 0001.

**ENTER** a lot size for version 0002 of **1000** pieces. Save each product cost collector. Select yes when asked if you want to create a preliminary cost estimate.

For production version 0001, accept the default costing lot size of 10. For production version 0002, you will need to enter a lot size of 1000.

4-1-2 Record the production process and product cost collector number.

Production process version 0001     ____________
Cost collector version 0001             ____________
Production process version 0002     ____________
Cost collector version 0002             ____________

4-2  In order to represent the production line for both production versions, it is necessary to create the cost object that represents this area.

4-2-1 Create a cost object for this production line. Use the cost object category SAP1, and name the cost object T-B4##. The cost object is assigned to Controlling area 1000, Company code 1000, Business area 1000, Plant 1000, and Profit center 1000. Designate this hierarchy as the highest level of the hierarchy. Save the cost object.

4-2-2 Using the production processes, assign both production versions 0001 and 0002 of material T-B4## to the hierarchy. Save the cost object.

4-2-3 From the Information System, display the cost object hierarchy to determine if the product cost collectors for production versions 0001 and 0002 are assigned to the node. While reviewing the hierarchy, review the current planned and actual costs for the cost objects.
4-3 Activity allocations need to be reported for the order handling activities that were used to support the entire production line during the current period.

4-3-1 Enter an activity allocation for your cost object T-B4##. 10 hours have been consumed from the sending cost center 4230, activity type 1421. Use screen variant Sales order/Cost object to process this activity allocation. Use today’s date as the posting date and version 0.

4-3-2 Display the cost object hierarchy report to verify the activity costs have been allocated to the cost object hierarchy. While displaying the hierarchy, review the current planned and actual costs for the cost objects. Change the report settings to display the data entry object to display the costs.

4-4 An additional period-end closing activity for cost object hierarchies is the distribution of actual costs to the orders that have been assigned to the hierarchy. This distribution should occur before overhead, WIP and variances are calculated.

4-4-1 Using the IMG, check if the distribution indicator is selected for cost object category SAP1.

4-4-2 Cost object distribution is determined by target costs. Target costs are calculated on the basis of delivered quantity. Enter a reporting point backflush of 100 pieces at reporting point 0060 for production version 0001 of material T-B4##.

4-4-3 Enter a reporting point backflush of 80 pieces at reporting point 0060 for production version 0002 of material T-B4##.

4-4-4 Now that target costs can be determined for both production versions assigned to the cost object hierarchy, execute distribution for the cost object hierarchy using the individual processing transaction. Execute the distribution for target cost version 1.

4-4-5 Review how the activity allocation for the cost object T-B4## was distributed for the hierarchy on the basis of the target costs of the production cost collector. From the Basic List, go to the Totals list, and display the distribution using the Totals list. From the totals list, access the cost element breakdown report. Note that the cost element report content changes depending on which level of the node your cursor is positioned on, either the cost object or production processes.

<table>
<thead>
<tr>
<th>Target costs production process for production version 0001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portion of distributed actual costs for version 0001</td>
</tr>
<tr>
<td>Target costs for production process for production version 0002</td>
</tr>
<tr>
<td>Portion of distributed actual costs for version 0002</td>
</tr>
</tbody>
</table>
To manage the cost object controlling for pump assembly T-F1##, a product cost collector must be created. The controlling level for the pump will be the BOM and routing.

1-1-1 Create a product cost collector for pump assembly T-F1##, using production plant 1000. The order type should be RM01. The product cost collector should be valid for a BOM and routing. While creating the cost collector, enter BOM usage 1, alternative 01, and search for a valid routing for material T-F1## in plant 1000. Save the product cost collector. Select yes when asked if you want to create a preliminary cost estimate.

Enter material T-F1##
Plant 1000
Choose Create
Enter order type RM01
Select BOM/routing
Enter BOM usage 1
Enter Alternative BOM 01
Enter task list type Routing
Search for the routing Group using the material T-F1## , matchcode C
Choose Confirm
Save
Choose Yes when asked if you want to create a preliminary cost estimate
1-1-2 Using the display transaction for the product cost collector, display the cost data. What cost data was assigned to the cost collector? What order type is assigned to the cost collector?

The product cost collector is immediately displayed:

The following information is displayed on the Data tab:

Costing sheet: COGS
Overhead key: SAP10
Results Analysis key: FERT-P
Variance key: 000001

The following information is displayed on the Header tab:

Order type: RM01
Order number:

The following information is displayed on the Production Process Tab:

Production process number:

1-1-3 Record the planned costing variant and the actual costing variant for the product cost collector. A different costing variant is specified for the planned costs than for the actual costs. Why is this necessary?

The costing variants are displayed on the Data tab:

Planned Costing Variant: PREM
Actual Costing Variant: PPP3

A unique costing variant must be selected for determining planned and actual costs, since the costing type indicates if the results of the costing variant will update either the preliminary cost estimate or the actual order costs. In addition, different material and activity prices can be selected for the preliminary cost estimate than is used for simultaneous costing. Different valuations may also be selected for external procurement and external activities.

1-2 A preliminary cost estimate was created for your product cost collector. Review the results of the cost estimate and display the customizing settings for the planned costing variant and order type RM01.

1-2-1 Display the preliminary cost estimate from the product cost collector. What are the costs of goods manufactured for 10 pieces?

The cost estimate can be accessed from the Header tab: Select Display cost estimate.

To display the cost for 10 pieces, change the entry for Cost based on to User entry, and enter 10 in the quantity field.

The COGM for 10 pieces is displayed:
1-2-2 Display the itemization report for T-F1##. Determine the calculated costs for the assembly T-B1##.

The value for 10 pieces of T-B1## is displayed in the itemization report.

1-2-3 Create another session. Display the current cost estimate for assembly T-F1##. Compare the preliminary cost estimate calculated for the product cost collector for assembly T-F1## with the current standard cost estimate for this material. Why can there be differences in these two prices?

Create another session (System → Create session)

Logistics → Materials Management → Material Master → Material → Display → Display Current

Before beginning task, choose Add to favorites

Enter T-F1##
Select Enter
Select Costing 2
Select Enter
Enter plant 1000
Select Enter

The current standard is displayed under the column marked Current.

The costing variant used to calculate the standard cost estimate and the costing variant used to calculate the product cost collector planned costs may use different valuation variants. However, even if they use the same valuation variant, the prices of the component materials and activity prices may have changed between the time the standard was created and the time when the cost was calculated for the product cost collector.

In addition, if there is more than one procurement process available for T-F1##, mixed costing could have been used to calculate the standard.

1-2-4 The planned costs were calculated using the costing variant PREM. In customizing, display the assignment of this costing variant to the order type RM01 defaults for plant 1000. From customizing, determine what costing variant is assigned for actual costs?

Tools → Accelerated SAP → Customizing → Edit Project

Before continuing with this choose Add to favorites

Choose SAP Reference IMG

Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Period → Product Cost Collectors → Define Cost-Accounting-Relevant Default Values for Order Types and Plants

Select plant 1000, Order type RM01

Choose Details

The costing variant for actual costs is PPP3.
1-2-5 Display the customizing settings for the calculation of the planned material costs for the product cost collector. What valuation variant is assigned to calculate the planned order costs for costing variant PREM?

Return to IMG node Product Cost Collectors, then
→ Check Costing Variants for Product Cost Collectors
Choose Costing Variants to Determine Activity Quantities
Select Costing Variant PREM
Choose Details
Valuation Variant Planned Valuation Material (001)

1-2-6 What type of costs are updated based on the costing type assigned to this costing variant?

From the detail screen for the costing variant, choose Costing Type
Select the Misc. tab
The preliminary costing for the product cost collector can be updated with the results of this costing type

1-2-7 What prices are selected for valuing the material components?

From the detail screen for the costing variant, choose Valuation Variant
The strategy sequence for material is:
1: Price from purchasing info record
2: Planned price 1
3: Standard price
4: Moving average price

1-2-8 What price is selected for valuing the production activities?

From the detail screen for the costing variant, choose Valuation Variant
Select the internal activities/processes tab
The strategy sequence is:
1: Planned price as average of all fiscal year periods
2: Planned price for the period

1-3 Create a production order and analyze the connection to the product cost collector.

Logistics → Production → Production Control → Order → Create → With Material.
Before continuing with this choose Add to favorites
1-3-1 Create a production order for 10 pieces of material T-F1##, using production plant 1000, order type PP08. Use forward scheduling, and enter today’s date as the start date.

Enter material T-F1##
Enter production plant 1000
Enter order type PP08
Select Enter
Enter the quantity of 10
Enter today’s date as the start date
Change the scheduling type to Forwards

1-3-2 Access the Control Data for the production order. How were the Costing Variant for Actuals, Costing sheet and Overhead key determined for the production order? Can they be changed for the production order?

Select Control data tab

The actual costing variant, costing sheet and overhead key were assigned to the order via the product cost collector. In this scenario, the production order is not a cost collector, the product cost collector is the cost collector for the production order. The display of these fields is for information only, they cannot be changed on the production order. Only the costing variant for planned costs can be changed.

1-3-3 What order status is related to the use of a product cost collector?

Select Status information. The status PCC identifies that a product cost collector is being used.

1-3-4 Locate the production process on the Control data screen. Is this production process unique for this BOM and Routing, or is it valid for all production methods for this material and plant?

The production process and BOM/routing are displayed on the Control data tab. This production process is unique to this BOM and routing. This was determined when the product cost collector was created.

1-3-5 From the assignment tab, determine which profit center has been assigned to the production order? Which master record determined the profit center?

Select the Assignment tab.

The profit center is displayed. The profit center is maintained in the material master record for T-F1##.
1-3-6 Go to the operations overview, and review the operations that have been selected for this production order. Which work center is assigned to operation 0010? What is the control key for this operation?

Choose Operation overview

The work center T-M## is assigned to operation 0010. The control key is PP01.

1-3-7 Review the material components and verify the required quantity for each component. What are the required quantities of components T-B1## and T-B2##? Is there any planned scrap for these components?

Select operation 0010

Choose components for operation

T-B1## 10 pieces
T-B2## 10 pieces

There is no planned scrap for these components. This can be confirmed by displaying the component detail screen.

1-3-8 Release the production order.

Choose Release order

1-3-9 Save the production order. Record the order number.

Choose Save

1-4 The use of a product cost collector is dependent on the order type selected for the production order. Display the order type defaults for plant 1000, and order type PP08 and review the customizing settings.

Favorites → Tools Accelerated SAP → Customizing → Edit Project

Choose SAP Reference IMG

Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Order → Manufacturing Orders → Define Cost-Accounting-Relevant Default Values for Order Types and Plants

Select plant 1000, Order type PP08

Choose Details

1-4-1 Is the product cost collector indicator selected?

Yes, the product cost collector indicator is selected.

1-4-2 What is the default rule for the CO settlement.

The default rule for CO settlement is PP2, periodic settlement.
If a product cost collector is found for a material, will the RA Key and Simultaneous Costing variant for order type PP08 default to the production order?

No, the RA key and simultaneous costing variant for order type PP08 will not default to the production order. The settings for the product cost collector will be used.
Solutions

Unit: Product Cost by Period using production orders
Topic: Posting Actual Costs

2-1 Since the production order has been released to the shop floor, inventory transactions and production confirmations can be posted against the order. This will cause actual costs to be recorded on the product cost collector.

2-1-1 Enter the goods issue for the material components reserved for the production order. Change the quantity of material component T-B1## from 10 to 11, due to material scrap that has occurred during assembly. Will this quantity change be reported as a variance?

Logistics → Production → Production Control → Goods Movements → Goods Issue.

Before continuing with this choose Add to favorites

Enter the movement type 261, the plant 1000, storage location 0001
Select To Order
Enter the production order number
Select enter
Change the quantity for T-B1## from 10 to 11.
Save the goods issue.
Select Enter to continue past the warning message regarding reserved quantity.

Yes, a quantity variance will be determined for this goods issue during variance calculation.

2-1-2 Enter a final shop floor confirmation for operation 10 of the production order. Enter a yield of 10 pieces, and increase the labor time by a factor of 10%, to reflect the additional processing necessary because of the scrapped components. Save the confirmation.

Logistics → Production → Production Control → Confirmation → Enter → For Operation → Time Ticket

Before continuing with this choose Add to favorites

Enter the order number and operation 0010
Select Enter
Enter the confirmation type Final confirmation
Confirm a yield of 10 pieces
Increase the labor execution time by 10%.
Save the confirmation.

2-1-3 Enter a partial shop floor confirmation for operation 60 of the production order. Enter a yield of 5 pieces and a scrap of 1 piece, and save the partial confirmation. Continue past the warning regarding the activity recalculation due to the partial confirmation. (Since the operation uses control key PP99, this is a milestone confirmation with an automatic goods receipt.)

Favorites → Confirmation → Enter → For Operation → Time Ticket
Enter the order number and operation 0060
Select Enter
Enter the confirmation type Partial confirmation
Confirm a yield of 5 pieces
Enter a scrap quantity of 1 piece
Save the confirmation.
Continue past the warning message regarding activity time calculation.

2-2 Using the Planned/Actual Comparison report from the Product Cost Controlling by Period report tree, review the actual cost information for the product cost collector for T-F1## from the proceeding transactions.

Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Period → Information System → Reports for Product Cost by Period → Detailed Reports → For Product Cost Collectors
Enter material T-F1##
Enter plant 1000
Choose Execute

2-2-1 Display the quantity of material T-B1## that was debited to the product cost collector. Display the activities that were debited to the product cost collector.
The activity types and materials are displayed under the Origin column.
To display the actual quantities for the line items:
Select Change Layout
From the Column Set, select Total Actual Quantity
Select Show Selected Fields
Select Transfer (Enter)
2-2-2 Locate the credit to the product cost collector for the delivery of T-F1##. Was the cost collector credited for the confirmation of the pump assembly that was reported as scrap?

The product cost collector was credited for the delivery of 5 pieces. The 1 piece that was reported as scrap does not credit the product cost collector. It will be calculated as scrap value when variances are calculated for the product cost collector.

2-2-3 What value was used to credit the product cost collector for the delivery of the pump assembly? Why?

The standard cost was used to credit the goods receipt. All materials that use Standard price control will also credit the production cost object with the standard price. Only materials with Moving average price control use a valuation variant to determine the cost object credit at time of delivery. This can be confirmed by displayed the accounting view of T-F1##, and locating the price control (Standard) and the current standard price.

2-3 The actual costs for the activities were calculated using the costing variant PPP3. Review the customizing settings for the calculation of the actual costs for the product cost collector

*Favorites → Tools → Accelerated SAP → Customizing → Edit Project*

2-3-1 Display the assignment of this costing variant to the order type RM01 defaults for plant 1000.

Choose SAP Reference IMG

*Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Period → Product Cost Collectors → Define Cost-Accounting-Relevant Default Values for Order Types and Plants*

Select plant 1000, Order type RM01

Choose Details

The costing variant for actual costs is PPP3.

2-3-2 What valuation variant is assigned to calculate the actual order costs for costing variant PPP3?

*Return to the IMG node Product Cost Collectors, then → Check Costing Variants for Product Cost Collectors*

Choose Costing Variants for Valuation of Internal Activities

Select Costing Variant PPP3

Choose Details

Valuation Variant *Production Order Actual (007)*
2-3-3 What price is selected for valuing the production activities? Is this the same price that was selected for the valuation variant used to determine the planned costs, valuation variant 006?

From the detail screen for the costing variant, choose Valuation Variant
Select the internal activities/processes tab
The strategy sequence is for actual costs is:
   1: Planned price for the period
To display the planned cost strategy, return to the IMG node
→ Check Costing Variants for Product Cost Collectors
Choose Costing Variants to Determine Activity Quantities
Select Costing Variant PREM
Choose Details
Choose Valuation Variant
Select the internal activities/processes tab
The strategy sequence for planned costs is:
   1: Planned price as average of all fiscal year periods
   2: Planned price for the period
No, they do not use the same price.
Solutions

Unit: Product Cost by Period using production orders
Topic: Period-end closing

3-1 Complete the process cost allocation.

3-1-1 Using the individual processing transaction for Process Cost Allocation, apply the actual process cost to the production order for version 0 of the current period.


Enter your material number

Plant 1000
Version 0
Period: Current month
Fiscal Year: current year
Deselect Test run
Select Detailed list
Choose Execute

3-1-2 From the detailed list display, determine the value of the process cost allocation. What are the total costs and quantity of processes for process 300900?

Select the order number
Select Goto → Period screen

The fixed and variable cost allocation for process 300900 are displayed.

3-1-3 Display the configuration settings for the determination of the process template. What process template is selected for the product cost collector?

Favorites → Tools Accelerated SAP → Customizing → Edit Project
Choose SAP Reference IMG

Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Period → Basic Settings for Product Cost by Period → Templates → Assign Templates to Cost Objects

The process template assigned to Controlling area 1000, costing sheet COGS, OH Key SAP10, and Environment 010 is COPC-10.
3-2 Please answer the following questions as either True or False.

3-2-1 System performance of period end closing activities such as revaluation of posted activities is improved with the use of product cost collectors, due to the reduced volume of cost objects as compared to product cost by order.

True

3-2-2 The revaluation of activity prices can be used to support the valuation strategy of ‘Actual activity price of previous period’.

True

3-2-3 The revaluation of activity prices should be executed after the allocation of process costs and overhead costs.

False

3-3 Complete the calculation of the overhead costs for the product cost collector for T-F1##.

3-3-1 Using the individual processing transaction for Overhead Calculation, apply the overhead costs to the product cost collector for the current period.


Enter your material number

Plant 1000

Version 0

Period: Current month

Fiscal Year: Current year

Deselect Test run

Select Detailed list

Choose Execute

3-3-2 From the detailed list display, determine the value of the overhead calculation. What are the total overhead costs? What cost center has been credited for the overhead allocation?

From the Basic List, select Next List Level

The value of the overhead is displayed.

The cost center 4130 is credited as the sender.
3-3-3 Display the configuration settings for the determination of the overhead costing sheet. What costing sheet is assigned to the valuation variant for actual costs, valuation variant 007?

Favorites → Tools → Accelerated SAP → Customizing → Edit Project

Choose SAP Reference IMG

Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Period → Product Cost Collectors → Check Costing Variants for Product Cost Collectors

Choose Costing Variants for Valuation of Internal Activities

Select Costing Variant PPP3

Choose Details

Choose Valuation Variant

Select the Overhead tab

The costing sheet Costs of Goods Manufactured (COGM) is assigned to this valuation variant.

3-4 The calculation of work in process is necessary to determine the current order balance for the product cost collector for T-F1##.

3-4-1 Using the individual processing transaction, calculate the Work in Process value for your product cost collector, using the current period and Results Analysis version 0.


Enter your material number

Plant 1000

WIP to Period: Current month

Fiscal Year: current year

Results Analysis version 0

Deselect Test run

Choose Execute

3-4-2 From the WIP display, position the cursor in the WIP list on the product cost collector and access the detailed report by selecting the button WIP explanation.

Choose the product cost collector

Select WIP Explanation
3-4-3 Explode operation 0010. This should reflect the quantities confirmed from the previous transactions. 10 pieces of the pump assembly were confirmed at operation 0010. Then, 5 pieces were confirmed at operation 0060 and 1 additional piece was reported as scrap at operation 0060. This leaves a remaining WIP quantity of 4 pieces at operation 0010.

3-4-4 Remain in the WIP explanation report. Using a different R/3 session, display the preliminary cost estimate for the product cost collector. Change the cost display to 4 pieces, to match the WIP quantity.

Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Period → Master Data → Product Cost Collector → Edit

Enter material T-F1##
Enter plant 1000
Select T-F1##
Select the Header tab
Choose Display Cost Estimate
Change the Cost based on to User Entry, enter 4 pieces

3-4-5 Go to the itemization report. Change the display variant to view the costs by operations (grouped). Explode the summation rows for operation 0010. Compare the costs of the planned cost estimate with the calculated WIP. They should be identical, to include the process and overhead costs.

Select the Itemization report. To review the itemization by operation, select Choose Select Layout.

Choose Operations (grouped)
The operation subtotal is displayed. In addition, the overhead (not assigned to an operation) has been included in the WIP calculation.

3-4-6 Leave the preliminary cost estimate for the product cost collector, and display the actual costs for the product cost collector. (Continue to display the WIP explanation report in the other session). Compare the calculated total WIP amount with the remaining balance for your production order. Are they the same value? Can you explain this?

Display the planned/actual cost report.

Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Period → Information system → Reports for Product Cost by Period → Detailed Reports → For Product Cost Collectors

Enter material T-F1##
Enter plant 1000
Choose Execute

The balance is displayed on the bottom of the report. No, the remaining order balance is not the same as the calculated WIP. With period-
Based controlling, the WIP is calculated by using the actual remaining quantity at the planned rate. For this product cost collector, 10 pieces were confirmed for operation 0010. In the subsequent confirmation 5 pieces were completed with an additional 1 piece reported as scrap. This leaves a remaining WIP quantity of 4 pieces.

3-4-7 Continue to remain in the calculate WIP task. Display the WIP report. Record the amounts for the WIP categories. How are the WIP categories determined?

Return to the Calculate Work in Process Object List (green arrow back)

Goto → WIP Report

The balances for the WIP categories are displayed.

The categories are determined based on the configuration of WIP. Specifically, the cost elements are assigned to a WIP category and LID. The category determines if the WIP should be capitalized, and the LID is used to identify the type of cost based on the cost element, i.e. Direct material costs, overhead costs and production costs.

3-4-8 Using another R/3 session, review the configuration settings for the WIP calculation using results analysis key FERT-P. Determine the assignment of the valuation variant for WIP for Controlling area 1000, results analysis version 0, results analysis key FERT-P.

Favorites → Tools → Accelerated SAP → Customizing → Edit Project

Choose SAP Reference IMG

Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Period → Period-End Closing → Work in Process → Assignment of Valuation Variant for WIP

The valuation variant assigned is 001.

3-4-9 Verify the valuation variant for WIP and scrap is defined as using the plan costs/preliminary cost estimate as priority 1.

Verify the settings for valuation variant 001.

From the IMG node Work in Process

→ Define Valuation Variant for WIP and Scrap (Target Costs)

Select valuation variant 001. Strategy 1 specifies the Plan costs/preliminary costing.

3-4-10 Display the configuration for posting the WIP balances to Financial Accounting for Controlling area 1000, Company code 1000, RA version 0. Record the account numbers.

From the IMG node Work in Process

→ Defining Posting Rules for Settling Work in Process
Using the individual processing transaction, execute variance analysis for your product cost collector. Calculate the variances for all target versions for the current period. Remain in the variance analysis list display to answer the following 3 questions.


Enter your material T-F1##

Plant 1000

Period: Current month

Fiscal Year: current year

Choose All target cost versions

Deselect Test run

Choose Detail list

Choose Execute

3-5-1 From the list display, determine what amount was used to value the scrap. What configuration setting determines the basis for the scrap value calculation?

The scrap value is displayed. The scrap value was determined by the valuation variant for scrap (and WIP). Valuation variant 001 specified to use the preliminary cost estimate as the basis for scrap value. Since the scrap was reported at the completion of the assembly (operation 0060) the scrap value is equal to the preliminary cost estimate COGM for 1 piece.

This can be verified by displaying the preliminary cost estimate for the product cost collector.

3-5-2 Select Cost elements, and display the variance report.

Select the cost object.

Choose Cost Elements

3-5-3 Display the variance report for target cost version 1. What caused the variance for cost element 890000, T-B1##?

Display target cost version 1.

Change the version setting to version 1 (Variances from production).

Choose Cost Elements
Select the first row for cost element 890000. Then select Explanation of Variances. This is an input quantity variance that was caused by changing the goods issue for T-B1## from 10 pieces to 11. (The reason is not visible from the report, only the variance category for T-B1## can be determined from the report.

3-6 After WIP and variances have been calculated, the variance categories can be settled to PA, and the WIP can be settled to FI.

3-6-1 Execute settlement for the product cost collector. Use the current period and year.


Enter your material T-F1##

Plant 1000
Settlement Period: Current month
Posting Period: Current month
Fiscal Year: current year
Deselect Test run
Choose Detail list
Select Execute

3-6-2 The system displays the basic list for the settlement. Display the detail list and access the settlement receiver of the variances. The system displays a list of the variance amounts for PA by variance categories, and for FI by material. Return to the detail list and select the accounting documents, and select the entry for Accounting document. What accounts were the postings made to?

Choose Detail lists

Select the product cost collector order number

Choose Receiver

The system displays a list of variance amounts for PA by Variance categories and for FI by material.

Return to the Detail list

Select Accounting documents

Select the entry for Accounting document

895000 Factory Output of production
231500 Expense price differences
893000 Inventory in process
793000 WIP
3-6-3 Return to the list of accounting documents, and access the Profitability analysis document. Check the settlement to the value fields according to the variance category. Which value field was the scrap settled to?

Use the green arrow back to return to the list of accounting documents.

Select Profitability Analysis
Select the tab Value fields
Use the next page icon through the PA document until the value field ‘scrap’ is visible.

3-6-4 Return to the detail list for the settlement, and display the sender and receiver information for the WIP accrual.

Display the WIP accrual.
Return to the Detail list
Select Detail list of accrual data for FI
Select the product cost collector order number
Choose Sender
Choose Receiver

3-6-5 Return to the detail list for the settlement, and display the settlement rule. What method and settlement type are defined for the material settlement? What order type parameter controlled the settlement type default?

Choose Settlement rule
The settlement method for determining the tracing factor is 005: Delivery value with product cost collector.
The settlement type is Periodic.
The settlement type is controlled by the Default rule for the order type. The default rule is STR for product cost collectors, and PP1 or PP2 for production orders.

3-6-6 From the settlement rule, display the settlement type parameters. What is the PA transfer structure?

GOTO → Settlement parameters
The PA transfer structure is E1

3-6-7 From customizing, display the assignment of the value field for the scrap variance category using PA transfer structure E1.

Favorites → Tools → Accelerated SAP → Customizing → Edit Project
Choose SAP Reference IMG
Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Period → Period-End Closing → Settlement → Create PA Transfer Structure
Select PA transfer structure E1
Select Assignment lines
Select Assignment 10 (scrap costs)
Select value fields
The value field VV350 is displayed.
Solutions

Unit: Product Cost by Period using production orders

Topic: Cost Object Hierarchy

Optional Exercise

4-1  The Production Processes need to be assigned to the correct node of the cost object hierarchy. These production processes will be created automatically via the product cost collector. For the assembly T-B4##, we will create the product cost collectors using the naming convention for production version.

Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Period → Master Data → Product Cost Collector → Edit

4-1-1  Create two product cost collectors for pump assembly T-B4##, using production plant 1000. Create a separate product cost collector for each production version; 0001 and 0002. The order type should be RM01. Accept the default lot size for version 0001. ENTER a lot size for version 0002 of 1000 pieces. Save each product cost collector. Select yes when asked if you want to create a preliminary cost estimate.

Enter material T-B4##
Plant 1000
Choose Create
Enter order type RM01
Select Production version
Enter Production version 0001
Choose Confirm
Save
Choose Yes when asked if you want to create a preliminary cost estimate

Repeat the same procedure to create a product cost collector for production version 0002. However, you must change the lot size to 1000 pieces on the production process tab before creating the cost estimate.

For production version 0001, accept the default costing lot size of 10. For production version 0002, you will need to enter a lot size of 1000.

4-1-2  Display the product cost collectors and record the production process and cost collector for each.
The cost collectors are immediately displayed.
The following information is displayed on the Header tab:
Cost collector number version 0001:
Cost collector number version 0002:

The following information is displayed on the Production process. Tab:
Production process number version 0001:
Production process number version 0002:

4-2 In order to represent the production line for both production versions, it is necessary to create the cost object that represents this area.

4-2-1 Create a cost object for this production line. Use the cost object category SAP1, and name the cost object T-B4##. The cost object is assigned to Controlling area 1000, Company code 1000, Business area 1000, Plant 1000, and Profit center 1000. Designate this hierarchy as the highest level of the hierarchy. Save the cost object.

Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Period → Master Data → Cost Object Hierarchy → Edit Cost Object Hierarchy
Cost Object T-B4##
Enter cost object category SAP1
Select Create
Enter a Description
Higher-level cost object: enter an * to designate this cost object as the highest node
Controlling area 1000
Company code 1000
Business area 1000
Plant 1000
Profit Center 1000
Save

4-2-2 Using the production processes, assign both production versions 0001 and 0002 of material T-B4## to the hierarchy. Save the cost object.

Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Period → Master Data → Cost Object Hierarchy → Edit Cost Object Hierarchy
Enter T-B4##
Select Change
Select Assignment Single Objects On/Off
Select New Entries
Enter material T-B4##, and use the F4 to select the Procurement Alternative/production process for version 0001. (Direct field entry is not available for the process, but if you use the search help for the field, the production versions will become available.)

Enter material T-B4##, and the production process for version 0002

Use the green arrow back to the overview screen

Save the cost object

4-2-3 From the Information System, display the cost object hierarchy to determine if the product cost collectors for production versions 0001 and 0002 are assigned to the node. While reviewing the hierarchy, review the current planned and actual costs for the cost objects.

Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Period → Information System → Reports for Product Cost by Period → Summarized Analysis → For Cost Object Hierarchy

Enter T-B4##

Select Hierarchy

Choose the cost object T-B4##

Select Expand Subtree

The production processes and cost collectors are displayed for each production version.

To display the planned and actual costs, select Choose Layout

Select ISAP02, Planned/actual variance

4-3 Activity allocations need to be reported for the order handling activities that were used to support the entire production line during the current period.

4-3-1 Enter an activity allocation for your cost object T-B4##. 10 hours have been consumed from the sending cost center 4230, activity type 1421. Use screen variant Sales order/Cost object to process this activity allocation. Use today’s date as the posting date and version 0.

Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Period → Actual Postings → Activity and Business Process Allocation → Enter

Document date: today’s date
Posting date: today’s date
Screen variant: Sales order/cost object
Sending Cost center: 4230
Activity type: 1421
Receiver cost object: T-B4##
Quantity: 10 hours

Save
4-3-2 Display the cost object hierarchy report to verify the activity costs have been allocated to the cost object hierarchy. While displaying the hierarchy, review the current planned and actual costs for the cost objects. Change the report settings to display the data entry object to display the costs.

Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Period → Information System → Reports for Product Cost by Period → Summarized Analysis → For Cost Object Hierarchy

Settings → Report Object Type → Data Entry Object

Enter T-B4##

Select Hierarchy

Choose the cost object T-B4##

Select Choose Layout

Select ISAP02, Planned/actual variance

The actual costs posted to cost object T-B4## during the activity allocation are displayed.

4-4 An additional period-end closing activity for cost object hierarchies is the distribution of actual costs to the orders that have been assigned to the hierarchy. This distribution should occur before overhead, WIP and variances are calculated.

4-4-1 Using the IMG, check if the distribution indicator is selected for cost object category SAP1.

Favorites → Tools → Accelerated SAP → Customizing → Edit Project

Choose SAP Reference IMG

Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Period → Cost Object Hierarchies → Define Cost Object Categories for Cost Object Hierarchies

Select cost object category SAP1

Choose Details

The distribution indicator is selected.

4-4-2 Cost object distribution is determined by target costs. Target costs are calculated on the basis of delivered quantity. Enter a reporting point backflush of 100 pieces at reporting point 0060 for production version 0001 of material T-B4##.

Logistics → Production → Repetitive Manufacturing → Backflush → REM Backflush

Before continuing, select Add to Favorites

Backflush type: Assembly
Backflush quantity: 100
Material T-B4##
Enter plant 1000
Production version 0001
Select RP backflush
Enter Reporting point 0060
Save

4-4-3 Enter a reporting point backflush of 80 pieces at reporting point 0060 for production version 0002 of material T-B4##.

Favorites Production → Repetitive Manufacturing → Backflush → REM backflush
Backflush type: Assembly
Backflush quantity: 80
Material T-B4##
Enter plant 1000
Production version 0002
Select RP backflush
Enter Reporting point 0060
Save

4-4-4 Now that target costs can be determined for both production versions assigned to the cost object hierarchy, execute distribution for the cost object hierarchy using the individual processing transaction. Execute the distribution for target cost version 1.

Enter cost object T-B4##
Extras → Set Target cost versions
Select Target cost version 1
Period: Current month
Fiscal Year: current year
Deselect Test run
Select Detailed list
Execute
Review how the activity allocation for the cost object T-B4## was distributed for the hierarchy on the basis of the target costs of the product cost collectors. From the Basic List, go to the Totals list, and display the distribution using the Totals list. From the totals list, access the cost element breakdown report. Note that the cost element report content changes depending on which level of the node your cursor is positioned on, either the cost object or production processes.

**From the basic list, select Totals lists**

This shows the cost object, target cost and actual cost for each cost object. From the totals list, access the cost element report, which displays the cost object and cost element, along with the actual and target quantities and costs.

The costs of the activity allocation for cost object T-B4## are split according to the target costs for the production versions.

<table>
<thead>
<tr>
<th>Target costs production process for production version 0001 for cost element 619000</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Portion of distributed actual costs for version 0001</td>
<td></td>
</tr>
<tr>
<td>Target costs for production process for production version 0002 for cost element 619000</td>
<td></td>
</tr>
<tr>
<td>Portion of distributed actual costs for version 0002</td>
<td></td>
</tr>
</tbody>
</table>
Product Cost by Order for Process Orders, Contents I

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  - Settlement for co-products
- Special processing in process manufacturing
  - Cost monitoring in production campaigns
- Comparison of Product Cost by Period versus Product Cost by Order

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At the conclusion of this unit, you will be able to

- Describe the features of Product Cost by Order.
- Describe the features of Cost Object Controlling with co-products.
- Explain how costs of production campaigns are monitored.
- Discuss the differences between the controlling methods of Product Cost by Order and Product Cost by Period.
Preface: Cost Object Controlling in the Process Industries - Business Scenario

- The production type is make-to-stock. The costs of sales orders are analyzed only in Profitability Analysis (CO-PA).
- Fertilizer is produced in a process manufacturing environment.
- The production process yields both fertilizer and other products.
- Raw materials and machine time are consumed. Additional costs are incurred by quality control checks and waste removal.

- The procedures for Product Cost by Order as the same whether a manufacturer uses process orders or manufacturing orders. In this scenario, we will use a process order to demonstrate the component Product Cost by Order.

- A manufacturer wants to measure and analyze his process costs with the R/3 System. The fertilizer is not made for specific customers.

- 1. The manufacturer creates standard cost estimates at the beginning of the fiscal year. These cost estimates use the information in the recipe. 2. The standard cost estimate calculates the standard price for the fertilizer and. All goods issues and goods receipts associated with the joint production of the fertilizer and acid are valued at the standard price. 3. In requirements planning, the manufacturer creates a planned order for 1000 kilograms. The manufacturer then converts this order into a process order. 4. The information in the process order is then used to calculate the planned costs for the fertilizer and acid. The manufacturer determines the variances for each item by comparing the preliminary cost estimate (planned costs for the order) with the standard cost estimate (planned costs for the material). 5. The manufacturer enters the actual costs for the materials, activities, and overhead with reference to the manufacturing order. 6. When a pump is received into inventory, the order is debited at the standard price. 7. Variance analysis: After the last goods receipt, the manufacturer compares the actual cost of the order with the standard cost estimate and the preliminary cost estimate for each order item. 8. Differences between the credit postings for goods receipts and the actual costs are settled to inventory and to Profitability Analysis.

- At the end of the period, the manufacturer can also calculate the work in process for order items that have not yet been delivered.
In *Product Cost by Period*, the work in process is valued at target cost. This valuation is based on the quantities confirmed for the operations or (in repetitive manufacturing) reporting points, less the quantities of goods received.

In *Product Cost by Period*, the variances are determined from the production quantity received into inventory during the period. The total variance is calculated by adjusting the standard cost of the material to the production quantity (target cost) and comparing the result to the actual cost from which the work in process and scrap variances have been subtracted.

In *Product Cost by Period*, you normally use product cost collectors.

In *Product Cost by Period*, both work in process and variances are determined for product cost collectors (or manufacturing orders) in a given period.
In *Product Cost by Order*, work in process is valuated at actual cost. Work in process is the difference between the actual costs debited to the order and the actual costs credited to the order as a result of goods receipts. In other words, work in process is the balance on the order. Work in process is reported if the order has the status REL (released) or PREL (partially released) but does not have the status DLV (delivered) or TECO (technically completed).

If the order has been delivered or technically completed, the balance on the order is no longer reported as work in process but is considered a variance. When the system determines the work in process, any work in process for the manufacturing order in a previous period is cancelled.

Variances are therefore only calculated if no further products will be manufactured or placed into inventory for the order. Variances are thus based on the lot size actually manufactured.

In *Product Cost by Order*, manufacturing orders never have both work in process and variances at the same time.
The application component *Product Cost by Period* contains the functions of *Cost Object Controlling* for the cost objects *product cost collector* and *cost object hierarchy*. These cost objects can only be used in *Product Cost by Period*.

The application component *Product Cost by Order* contains the functions of *Cost Object Controlling* for the cost objects *production order* and *process order*. Costs of production orders and process orders can be recorded either by period or by order.

For manufacturing orders, you always perform the period-end closing process in the application component *Product Cost by Order* regardless of whether you are using period-based or order-based *Cost Object Controlling*. You normally manage the costs of manufacturing orders in the *Product Cost by Order* component. Here you use default rule PP1 (full settlement).

Whether the costs of a given manufacturing order are managed by order or by period is controlled by the settlement type specified in the settlement rule of the manufacturing order. The settlement type is determined through the default rule specified in the default values for the order type and plant. If you want to monitor the costs of manufacturing orders by period, use default rule PP2 (periodic settlement).

Note on terminology: This course often uses the term *manufacturing order*. This is an umbrella term for *production order* and *process order*. 
The application component *Product Cost by Order* enables costs to be analyzed at the level of manufacturing orders. You can use the *Product Cost by Order* component with make-to-stock production and sales-order-related production.

In the *Product Cost by Order* component, you use the manufacturing orders as the cost objects. The costs updated on manufacturing orders are usually analyzed and settled by lot. This means that in most cases, variances are not determined until the entire quantity to be manufactured has been delivered to inventory.

In process manufacturing environments where co-products are produced, *Product Cost by Order* allows you to analyze the costs for each co-product.

You can also analyze and settle the costs for manufacturing orders by period. However, SAP recommends settling manufacturing orders by lot rather than by period. If you want to settle the costs by period, you should use product cost collectors. In joint production, the SAP System provides integrated support of *Product Cost by Order*. In joint processes (co-products), work in process can only be calculated at actual cost.
Road Map: Product Cost by Order

- Master data
  - Production orders
  - Process orders
- Preliminary costing
- Simultaneous costing
- Period-end closing
  - Preliminary settlement of co-products
  - WIP
  - Variance calculation
  - Settlement
- Special processing in process manufacturing
  - Cost monitoring in production campaigns
- Comparison of Product Cost by Period versus Product Cost by Order
If you use production orders, the system transfers a routing and a BOM into the master data of the order header. You can specify the following parameters in Customizing for Production in dependency on the order type:

- Which selection ID is used to select the routing.
- Which BOM application is used to select the BOM.

Each operation in the routing is defined as relevant or not relevant to costing. You can check whether the operation of a routing is relevant to costing in the control key of the operation or in the detail screen of the operation. You can also work without a routing. In this case, an operation is generated automatically when you create an order. You can manually assign material components and production resources to this operation.

Each item in the BOM is defined as being relevant or not relevant to costing. You can check whether a BOM item is relevant to costing in the detail screen of the BOM item. You can also work without a BOM by assigning the required components to the operations manually.

The BOM and routing can also be selected through a production version.

The control data for Cost Object Controlling (such as costing variants, results analysis keys, and variance keys) are located in the order header under the Control data tab.
If you are manufacturing on the basis of process orders, the system uses the **master recipe** and associated **materials list** in accordance with the parameters for the order type specified in Customizing for *Production Planning - Process Industries*.

The master recipe contains operations and phases. An **operation** is performed on a primary resource. Operations are divided into phases. A **phase** is a self-contained work step that describes one part of the production process in detail. It uses the primary resource of the operation. Operations and phases can use secondary resources in addition to the primary resource. Resources are linked to cost centers. The cost center assigns activity types to the resource. The sequence of steps in the production process is defined by the sequence of phases.

For each operation or phase, you plan one or more materials that are required for the execution of that step.

In process manufacturing only the phases are costed, not the operations. A phase contains standard values for activities. These standard values are used to determine dates, capacity requirements, and costs. The **relevant to costing** indicator in the phase must be selected.

If the materials list contains co-products, you can add additional co-products. You cannot, however, delete co-products from the materials list. To check whether a material component is relevant to costing, go from the materials list to the detail screen for the material.

If no co-products are being used, the costs are updated to the order header.
The illustration shows the following:

- **Input materials** (raw materials and semifinished products) that enter the production process. These materials debit the manufacturing order when they are withdrawn from inventory (goods issue).

- **Intra materials** (material type INTR) are temporary and exist only between production phases. Intra materials appear in the material list as items of category M, but are not costed. If the process is interrupted because of a malfunction, however, an intra material may have to be put into inventory. In this case it is valuated with a price in the material master that is selected through the valuation variant for the valuation of goods received.

- **Remaining materials** that are output by the process. Remaining materials are represented as by-products.

- **Circulating materials** (such as catalysts) can be both a process input and a process output. You can specify in the material list whether the costs for a circulating material should be taken into account. The system selects a price for the circulating material from the material's master record. If the circulating material is flagged as relevant to costing, the material costs appear in the itemization twice: once with a plus sign and once with a minus sign. The balance is the material input cost.

The production of one or more products simultaneously: If more than one product is produced by the same process, the products are called **co-products**.
In a joint process, one product cannot be manufactured without manufacturing others. Standard costs, planned costs, and actual costs for the individual co-products (also called joint products) in the process are usually calculated using an apportionment structure that is specified in the material master.

The co-products output by a joint process each have substantial revenue-generating ability. If a material is a co-product, you select the Co-product indicator in the MRP view or costing view of the material's master record.

In the materials list, all co-products (both leading co-products and non-leading co-products) are items with a negative quantity. Leading co-products are called primary products. For primary products, you also select the Co-product indicator in the BOM.

Material master records can be created for process materials as well. A process material is not a physical entity, but merely represents a production process. An apportionment structure is specified in the master record for the primary product or process material. From a logistical point of view, the use of process materials is not recommended.

Special feature: Fixed-price co-products. You can flag a co-product in the material master as a fixed-price co-product. For detailed information on fixed-price co-products, see the documentation for Product Cost Planning.
Remaining materials are represented as by-products. A by-product is an incidental output of a joint process. You enter a by-product with a negative quantity in the materials list of a primary product or process material. For by-products, you do not select the Co-product indicator in the material master record or in the BOM.

If the by-product is flagged as relevant to costing, its costs are subtracted from the costs for the production process using the net realizable-value method. For example, the cost of goods manufactured for the primary product or for the other co-products equals the total cost of the production process less the costs for the by-products.

In Product Cost Planning, the cost of goods manufactured for a by-product can be calculated in two ways:

- Using a price from the material master.
- The by-product can be manufactured using an alternative production structure, and a corresponding cost estimate for the by-product already exists. In this case, the cost component split of the by-product is subtracted from the production process.

In the actuals, when a by-product is placed into inventory, the order header is credited with a price in the material master. This reduces the total cost of the production process.
In most cases, co-products are manufactured on the basis of process orders. However, co-products can also be manufactured on the basis of production orders. This example uses process orders.

The system recognizes whether a material is a co-product from its master record. For each co-product (including the primary product), the system generates an order item and turns on the MultItm indicator.

The planned quantities and the quantities received into inventory of the products manufactured are updated to the order item.

The following events take place in Cost Object Controlling:

- The planned costs of the manufacturing order are determined using the quantity structure specified in the manufacturing order. These costs are distributed to the co-products using the apportionment structure.

- The actual costs are collected on the header of the manufacturing order. At the end of the period, the actual costs on the order header are distributed to the order items using the apportionment structure. Work in process and variances are determined at the level of the order items. The order items are then settled.

You specify the apportionment structure in the material master or in the process order.
Road Map: Product Cost by Order

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- The system valuates the planned quantities of the material components using the materials list.
- The system determines the planned activity quantities using the master recipe.
- To valuate the planned material components, activities, and business processes, the system uses the planned valuation variant specified in the default values for the order type and plant. The overhead expenses are calculated using the costing sheet specified in the planned valuation variant. If template allocation is being used, the template is selected through the costing sheet and the overhead key.
- The planned costs are updated to the manufacturing order.
A preliminary cost estimate is normally generated for the process order when it is saved or released, in accordance with the Customizing settings in the default values for the order type and plant.

The order costs are calculated for the order header and distributed to the co-products on the basis of equivalence numbers. The equivalence numbers are entered in an apportionment structure.

When a process order is created, the system automatically generates the following:

- On the basis of the apportionment structure, the system generates a settlement rule that distributes the total order cost to the co-products (the order items). The costs are distributed to the order items both in the preliminary cost estimate and in the actual data.

- The system generates a settlement rule for each item, in accordance with the default rule. These settlement rules control the settlement of the distributed costs to materials.
An apportionment structure is used to apportion the costs to the primary products and co-products. The apportionment structure is specified in the production version or in the material master record of the leading co-product. It can also be specified directly in the process order.

In Product Cost Planning the costs are assigned to the co-products by cost component so that the cost component split can be used in costing-based Profitability Analysis (CO-PA) for valuation purposes.

In the preliminary cost estimate for the process order, the planned costs are distributed to the co-products.

If you want to have different equivalence numbers depending on the cost elements that debit the order header, use a source structure. You assign cost element intervals to the items of the source structure. You can assign different equivalence numbers for each source assignment. Example: You can distribute the material costs to the co-products at a ratio of 3:2 but the overhead costs at 1:1.
Process orders are orders of order type 40 (process order).

Process orders are usually analyzed by lot. That is, the variances are not determined until the order has the status delivered or technically completed. For orders that are analyzed by lot, you specify default rule PP1 (Production Material Full Settlement) in the order type. This ensures that settlement type FUL (full settlement) is specified in the settlement rule for process orders of the relevant order type.

A results analysis key must be specified in all manufacturing orders for which you want to determine work in process. Use a results analysis key for WIP calculation at actual costs.

For preliminary costing and simultaneous costing, enter the costing variant and valuation variant in the order type. This defines the valuation procedure for materials, internal activities, external activities, and business processes. It also determines which overhead structure is used to calculate overhead.

If you want to analyze product costs by lot, collect the costs directly on the process order. In this case you do not select the Product cost collector indicator.

The default values for the order type are transferred into the process order when it is created.

The same procedure is used with production orders.
Road Map: Product Cost by Order

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Process orders are usually charged with actual costs through confirmations in Logistics.

- A cost object can be charged with secondary costs through internal activity allocations that are executed automatically when the confirmation is entered.
- A cost object can be charged with primary costs through material withdrawals (material backflushes, goods issues) that are generated automatically when the confirmation is entered.

In addition, the goods receipt can be posted automatically when the confirmation is entered.

Actual costs are charged to the order header as they are incurred. When a goods receipt for a co-product is posted, the order item is credited accordingly.

To be able to see the actual costs for each co-product, you must perform the Preliminary Settlement for Co-Products, Rework function in the period-end closing process.

Additional remarks on logistical processing: If you are using milestone confirmations, you must confirm the milestones in the specified sequence. Operations that are not milestones are automatically confirmed when the milestone is confirmed. If an operation is a milestone it is specified in the routing with the control key of the operation.
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In Release 4.5, the period-end closing activities for co-product orders were enhanced to enable integrated cost controlling for individual co-products.

Once the period costs have been allocated to the order header, the costs are distributed from the order header to the order items.

WIP calculation, variance calculation, and settlement are then performed at the level of the order item.
### Functions in the period-end closing of *Product Cost by Order*:

- Template allocation
- Revaluation of activity types and business processes at actual prices
- Calculation of overhead expenses
- Preliminary settlement of co-products, rework
- Calculation of work in process: In *Product Cost by Order*, the work in process is valuated at actual cost.
- Variance calculation
- Settlement
  - Work in process is settled to *Financial Accounting* (FI) and *Profit Center Accounting* (EC-PCA).
  - The order balance is settled to FI, *Actual Costing/Material Ledger* (CO-PC-ACT) and EC-PCA.
  - The variance categories are settled to *Profitability Analysis* (CO-PA).
- The Schedule Manager simplifies the period-end closing process. This function is described in detail elsewhere.
At the end of the period, the actual costs on the order header are distributed to the order items. This charges each co-product with its share of the actual costs. When it distributes the actual costs, the system uses the equivalence numbers defined in the apportionment structure. In some cases it may also use the source structure. To distribute the actual costs, you use the function preliminary settlement for co-products, rework. You use this function after you have allocated the period costs to the header of the manufacturing order. The costs are distributed to the co-products using the original cost elements.

You make the necessary settings in Customizing for Product Cost by Order to ensure that:

- Settlement to an order item is allowed (you make this setting in the settlement profile).
- Either proportional settlement (indicator equivalence number) or percentage settlement (indicator %-Settlement) is allowed (you make this setting in the settlement profile).
- The allocation structure contains all cost elements with which the order header can be debited.

Actual costs must be distributed to the order items before you can calculate WIP and variances or allocate costs to other application components.

If you have not specified an apportionment structure in the material master record or in the production version, you must enter equivalence numbers for distribution in the settlement rule of the order header. In this case you cannot use a source structure.
Work in process for co-products is always valuated at actual cost. The WIP is valuated using the actual costs posted to the order item less the credits from goods receipts.

Valuating WIP at actual cost requires that the order item have a settlement rule with settlement type FUL (full settlement). Settlement type FUL is derived from default rule PP1 (Production Material Full Settlement) which is specified in the order type. If a manufacturing order for co-products uses settlement type PER (default rule PP2), no work in process can be determined for it. If you are using a cost object hierarchy with co-products, you cannot use any work in process because a cost object hierarchy can only have manufacturing orders with periodic settlement.

The calculation of work in process depends on the status of the manufacturing order. The system continues to calculate work in process for the co-products until the header of the manufacturing order has the status DLV (delivered) or TECO (technically completed). The manufacturing order only receives the status DLV when all order items have been delivered. When the order has the status DLV and TECO, the WIP calculation function cancels any WIP from the previous period. To see whether particular order items have been delivered, access the materials list from the process order. From the materials list, access the detail view and look at the indicator Final del. (final delivery).
When you settle the work in process, it is transferred to Financial Accounting (FI).

- If the debit of the order item is greater than the credit, the system debits Unfinished Goods Inventory and credits Unfinished Goods Inventory Change.

- If the debit of the order item is less than the credit, the system debits Expense for Reserves for Unrealized Costs and credits Reserves for Unrealized Costs. This expense posting corresponds to a value adjustment for the finished products that have already been capitalized in FI.
In the case of manufacturing orders that have co-products and whose order item has settlement type FUL, variances can only be calculated when all order items have been delivered (that is, when the delivery completed indicator is set for all order items and the status DLV is set for the order). For manufacturing orders without co-products that have the settlement type FUL, variances can only be calculated after the status DLV has been set for the order.

For manufacturing orders that have co-products for whose order item the settlement type is PER, the order balance is always interpreted as a variance (regardless of the status). No work in process is calculated for these manufacturing orders. For manufacturing orders without co-products that have the settlement type PER, variances and work in process are determined using the target cost calculation.

No scrap variances can be calculated for co-products. You should therefore use a variance key for which the Scrap indicator is not selected.
- The following takes place when the order has been delivered and settled:
  - Work in process posted in a previous period is cancelled.
  - The order balance is reduced to zero by transferring to FI the difference between the actual cost and the preliminary valuation of the inventory by the goods receipt. If the price control indicator is set to $S$, the system debits *Price Differences* and credits *Finished Goods Inventory Change*.

  Settlement is also made to *Profit Center Accounting* (EC-PCA) and *Actual Costing/Material Ledger* if these components are active.

  - The total variance is transferred to profitability segments in *Profitability Analysis* (CO-PA). You can transfer the individual variance categories of the total variance to value fields in CO-PA.
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A production campaign is a set of planned orders and process orders to produce a particular quantity of material on a production line over a particular length of time and in an uninterrupted sequence.

**Production campaign:**
Set of planned orders and process orders to produce a particular quantity of material on a production line over a particular length of time and in an uninterrupted sequence.

- A campaign is a set of manufacturing orders to produce a material. Campaign service costs (such as setup costs, cleaning costs, and teardown costs) are assigned to the campaign. The campaign service costs are assigned to the manufacturing orders by period and on the basis of the allocation-by-cause principle.
- A typical production campaign consists of:
  - Manufacturing orders (process orders or production orders) with reference to a material
  - Manufacturing orders without reference to a material. These are setup, cleaning, and teardown orders (campaign service orders) whose activities are used by each process order or production order in the campaign.
- You can distribute the costs for setup, cleaning, and teardown to individual manufacturing orders using:
  - Internal orders
  - Overhead allocation
  - Business processes
- This section discusses the use of production campaigns with business processes. The advantage of business processes is that costs can be allocated to the manufacturing orders by period and on the basis of the allocation-by-cause principle.
You create the production campaign in the menu of *Production Planning - Process Industries*.

In the production campaign, you create planned orders and convert them into manufacturing orders. Existing process orders can be assigned to the campaign.

For activities such as setup, cleaning, and teardown, you create master recipes without reference to a material. You then create process orders without reference to a material. The master recipes in the process orders without material reference are also without material reference (setup/cleaning recipe). You can create the process orders without material reference within the campaign, or assign them to the campaign later.

You create a business process for each campaign service activity such as setup or cleaning.

The business process is credited each month through template allocation. Template allocation controls how often the process is allocated to the process orders. The process orders are debited accordingly.

The process order without material reference is debited at the time the actual costs (such as for cleaning) are incurred. The actual costs are settled to the business process at the end of the month.

A business process can use the output of more than one campaign.
This example illustrates a campaign to manufacture paint, including subsequent cleaning. The equipment is cleaned after the production run is completed. It may be the case that the costs are not incurred until the process orders have already been delivered or are technically completed; they may even be flagged for deletion. To enable the costs to be charged to the process order at an earlier time point, you use business processes. You can allocate the cost of the cleaning to a process for which you defined a preliminary price when you planned the cost of the process. The process costs for the cleaning are allocated to the process order on the basis of the quantity produced and in accordance with the cause-effect principle.

Any over-absorption or under-absorption is settled from the process order directly to Profitability Analysis (CO-PA).

If the costs charged to a business process are high enough to take into account when the work in process is posted in FI, you make a manual posting in Financial Accounting in the amount of the balance of the business process. To analyze the costs of the production campaign, you can:

- Analyze the target costs vs. the actual costs and the planned costs vs. the actual costs of the individual process orders.
- Summarize the orders in the campaign so that you can monitor the costs of the production campaign and judge its overall efficiency.
- Calculate the variances for the business processes in Activity-Based Costing.
Production Campaign with Business Processes: Summary

- Allocation of fixed costs of campaign to materials
- Preliminary costing for production campaigns
- Cost reports for production campaigns and business processes
- Reducing costs by grouping process orders
  - Efficient use of costly setup and cleaning processes
  - Period-based allocation of fixed costs of campaign based on cause-effect principle
- No problem with follow-up costs

A production campaign enables single-product campaigns. A single-product campaign contains planned orders and process orders for a single material (in addition to non-material-based process orders for processes such as cleaning). Such campaigns can therefore only have one material-based master recipe. Production campaigns can be defined for leading co-products and for process materials.

Create a business process group for the business processes that you use in the production campaign. Enter the business process group in the campaign. Entering this campaign-specific business process group differentiates the process costs incurred by production processes for the campaign from other process costs. This prevents campaign process costs from being doubled in the campaign reports. If you did not enter a business process group in the campaign, the process costs shown in the reports for the campaign would be reported both for the orders without reference to a material and for the reports with reference to a material.

In Customizing for Product Cost by Order, specify a settlement profile in the order type for the non-material-based orders that allows settlement to business processes.

In the standard cost estimate for the material, you can use a template to represent the campaign service costs. You can also represent the campaign service costs with other means, such as overhead costing.

You can create a preliminary cost estimate for the production campaign. As is the case with manufacturing orders, the itemization of the preliminary cost estimate of the production campaign is generated dynamically. For this reason it is not possible to view the itemization in the information system.
Road Map: Product Cost by Order

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- Comparison of Product Cost by Period versus Product Cost by Order
So, what’s the difference between using

- Product Cost Collectors
  or
- Manufacturing Orders
Comparison of Full Settlement versus Periodic Settlement

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- Any manufacturing order can utilize either Product Cost by Order or Product Cost by Period method. The determination is the configuration of the plant and order type parameters.
  - When utilizing Product Cost by Period, the product cost collector order type will use the default rule STR. In addition, the manufacturing order type will have default rule PP2 (periodic), and the product cost collector indicator selected.
  - If using Product Cost by Period without the product cost collector, the manufacturing order type will have default rule PP2 (periodic), but the product cost collector indicator will NOT be selected. This controlling method, although possible, is NOT recommended by SAP.
  - If using Product Cost by Order, the manufacturing order type will have the default rule PP1 (full), and the product cost collector indicator will NOT be selected.

* Settlement must be performed each period if WIP is to be posted directly to Financial Accounting.
When using Periodic Settlement, WIP and Variances are analyzed for each period.
When using Full Settlement, the calculation of WIP and Variances are based on the status of the order. When the order has the status of *Released, Partially Released or Partial Delivery*, WIP will be calculated. When the order has the status *Delivered* or *Technically Complete*, the remaining WIP balance will be cancelled, and Variances will be calculated. A WIP balance and Variances calculation cannot occur in the same period.
Cost Object Controlling using Product Cost Collectors

Advantages:

- Lean Cost Management.
- Controlling focus is product/production process based rather than manufacturing based.
- Reduced number of cost objects improves period end closing process.
- Variances are recognized in the period in which they occur.

Disadvantages:

- Cost accountability to the production order is not readily visible.
- Not recommended when production involves significant set-up costs and there is a large variability in lot size or when the BOM and Routing are not stable.
- Not available when WIP and variance analysis is required at the co-product level or when using collective orders.

Product Cost Collectors can be used in the following manufacturing environments:

- In repetitive manufacturing: mandatory usage of product cost collectors
- In production order-related manufacturing: optional
- In process manufacturing: optional

The determination of which controlling process to use is simply the selection of an order type, and the presence of a product cost collector. Controlling can create the product cost collector at the level of controlling they desire, and simply activate the Product Cost Collector indicator for the manufacturing plant/ order type parameters. No process change to the manufacturing environment is necessary.
Cost Object Controlling using Manufacturing Orders as the Controlling Object

**Advantages:**
- High level of accountability at the manufacturing order level.
- Full settlement provides manufacturing order level variance analysis, best suited for complex manufacturing environments and orders with high set-up costs and varying lot sizes.

**Disadvantages:**
- Large number of cost objects to process at period end.
- When using Full settlement, variances cannot be analyzed until the manufacturing order is completed.

Manufacturing orders can be used as cost objects in the following manufacturing environments:

- In production order-related manufacturing: optional
- In process manufacturing: optional
- Co-product manufacturing using either production or process orders, whenever WIP and Variance calculation at the co-product level is necessary: mandatory.

Manufacturing environments can use both controlling methods in parallel, even for the same material. Whenever applicable, the product cost by period method would be recommended, thereby reducing the number of cost objects to be managed, and improving processing time for period end closing. If however, a particular product does not fit the product cost by period situation, then choose to control that product at the manufacturing order level.
Key Message

Collect costs at the level required to measure the efficiency of your manufacturing environment!

If you only evaluate your products after period end close by summarizing all of the manufacturing orders to the product level, select Product Cost by Period.

Don’t collect data that you will not use!

- Products manufactured continually using specific BOMS and routings are best suited for Product Cost Collectors.
- Products with either high numbers of engineering changes, high setup costs with variable production quantities, or joint production are best suited for Cost Object Controlling at the manufacturing order level.
Product Cost by Order is used in flexible manufacturing environments where it is important to know the costs incurred by each lot.

In Product Cost by Order, you collect and analyze costs on manufacturing orders.

You can analyze the costs of co-products by lot.

The function preliminary settlement for co-products, rework distributes the actual costs of the manufacturing process to the co-products. You can calculate work in process and variances for co-products.

In Product Cost by Order, work in process is always valued at actual cost.

Variances for co-products are not determined until all order items have been received into inventory.

In production campaigns, costs can be assigned to products using business processes, concentrating cost measurement on the causal factors that result in costs. You can analyze the costs of production campaigns.
Exercises

Unit: Product Cost by Order using process orders

Topic: Master data and preliminary costing

At the conclusion of this exercise, you will be able to:

- Display the joint production data for a co-product
- Create a process order, and analyze the costing data that is defaulted to the process order
- Display the settlement parameters for a joint production order
- Explain the affect of using the settlement type Full
- Analyze the planned costs for a joint production order

Controlling has determined that some products that your company manufactures are better suited to the Product Cost controlling by Order method. This allows controlling to focus on the total manufactured quantity of the order, and supports controlling analysis at the production or process order level.

Manufacturing has identified that some of the production processes in your company yield co-products from a single manufacturing order. Although the benefit of this is recognized in manufacturing and planning, you have been asked to evaluate the controlling capabilities for the joint production process. You realize that the controlling methods for joint production are only available when the Product Cost by Order method is utilized. Therefore, you decide to evaluate the business scenario of product cost controlling by order using the process order

1-1 Engineering has provided you with a master recipe for fertilizer that includes co-products. Both the production process and the materials are provided by plant 1100. Before you create a process order, verify the co-product data for the joint production process in the material master.

1-1-1 From the costing view of the material master record, verify that the leading co-product, T-FF1## in plant 1100, has been identified as a co-product.

1-1-2 What co-product has been included in the joint production for T-FF1##? What is the apportionment of costs for T-FF1## and this co-product?

Co-product:
Materials:
Prod:
Misc:
1-2 Create a process order for the production of the fertilizer, and analyze the master data used by cost object controlling for the joint production process.

1-2-1 Create a process order for 1000 liters of material T-FF1##, using production plant 1100, order type PI01. Use forward scheduling, and enter today’s date as the start date.

1-2-2 Select Material list, and determine if the co-product indicator is active for material T-FF3##. If this indicator is not selected, will this material be managed as a co-product or by-product?
   Is the indicator selected:
   If not, will the material be managed as a co-product or by-product?

1-2-3 From the process order header, display the settlement rule. Which receivers are entered, and why?
   Receivers:
   Why:

1-2-4 Which settlement type is entered? What are the consequences of this?
   Settlement type:
   Consequences:

1-2-5 Display the Control Data for the production order. What costing variants are entered for the planned and actual cost? How were the costing variants determined?
   Planned costing variant:
   Actual costing variant:
   Determined by:

1-2-6 What costing sheet is assigned to the production order? How was the costing sheet determined?
   Costing sheet:
   Determined by:

1-2-7 What overhead key is assigned to the production order? How is the overhead key determined?
   Overhead key:
   Determined by:

1-2-8 Will the planned costs be calculated automatically when the order is saved?
   (Circle one) Yes or No

1-2-9 Release the process order.
1-2-10 Save the process order. Record the order number. If prompted to assign a batch number to the co-products, enter A## for T-FF1##, and B## for T-FF1##.

Process order number:

1-3 Using the Order Cost report from the Product Cost by Order information system, review the calculation of the planned costs for the process order and verify the planned distribution of costs for the co-products.

1-3-1 Using the setting *Order Items On/Off*, enter an * for order items, and determine what is the total planned debit for T-RF1##. Use the report layout *ISAP02, Cost development* to display the planned cost information.

   Total debit:

1-3-2 Execute the report again, but for only order item 2, T-FF3##. What is the planned cost distribution to co-product T-FF3## for component T-RF1##?

   Distribution to T-FF3##:

1-3-3 Is this consistent with the apportionment of material costs defined in the settlement rule of the process order?
Exercises

Unit: Product Cost by Order using process orders

Topic: Simultaneous Costing and Period-end closing when order is not complete

At the conclusion of this exercise, you will be able to:

- Analyze the actual costs for the order header and order items
- Calculate process costs and overhead costs for the manufacturing order
- Execute distribution of the actual costs from the process order header to the order items (co-products)
- Execute WIP calculation for the co-products using actual costs
- Review the customizing settings for the WIP calculation at actual costs
- Settle the WIP to Financial Accounting

If the manufacturing order is not completed by period-end, it is necessary to calculate the actual WIP value, so that this balance may be transferred to Financial Accounting. In addition, process costs and overhead costs must be applied to the order prior to the WIP calculation.

You have been asked to execute the period-end closing tasks for your process order. Since this is a joint production order, you will need to complete the additional task of distributing the actual costs from the order header to the order items. This will be necessary to support the calculation of WIP for the individual order items.

In preparation, several inventory transactions and order confirmations will need to be entered for the process order.

2-1 Once the process order has been released to the shop floor, inventory transactions and confirmations can be posted for the process order. This will cause actual costs to be recorded on the process order.

2-1-1 Enter a final shop floor confirmation for operation/phase 230 of the process order. Enter a yield of 1000 liters and save the confirmation.

2-1-2 Enter a partial confirmation for 500 liters for operation/phase 330 of the process order.

2-1-3 Using movement type 101, enter a goods receipt for the delivery of 500 liters of fertilizer, and 3.5 liters of sulfuric acid.

Use Next Screen to continue past the classification screen for the batch specifications for both materials, T-FF1## and T-FF3##. Press Enter to continue past the warning messages regarding the PU quantity.
2-2 Using the order cost report from Product Cost by Order Report Tree review the actual cost information for the proceeding transactions.

2-2-1 To display the actual costs for the sulfuric acid T-FF3##, use the cost report and enter the process order number. Next, change the Settings to *Order Items On/Off* and enter order item 2, and execute the report. Display the cost report and determine the value used to credit the process order for the goods receipt for the sulfuric acid T-FF3##.

T-FF3##:

2-2-2 Execute the actual cost report again, this time displaying the costs for the fertilizer, order item 1. Determine the value used to credit the process order for the goods receipt for the fertilizer T-FF1##.

T-FF1##:

2-2-3 Lastly, to display the actual costs for the all items in the order, execute the report again but enter an * for the order item. Record the order balance.

Order balance:

2-2-4 Using the *Cost development* layout, determine if actual costs been distributed to the co-products?

Answer:

2-3 Complete the process and overhead cost allocation for the process order.

2-3-1 Using the individual processing transaction for Process Cost Allocation, apply the actual process cost to the process order for version 0 of the current period.

2-3-2 Using the individual processing transaction for Overhead Calculation, apply the overhead costs to the process order for the current period.

2-4 If using joint production, it is possible to calculate WIP and variances for the individual co-products. However, to enable this, the actual costs for the order must be distributed to the co-products prior to calculating either the WIP or variances for period-end.

2-4-1 Execute the individual processing of preliminary settlement for co-products for the process order for T-FF1## for the current period. Answer the following 2 questions prior to leaving the preliminary settlement results screen.

2-4-2 Select the detail list for the actual settlement, and display the sender. The individual cost elements that debited the process order are listed as the senders. Next, access the receivers. The settlement receivers should list the order items (co-products) as the receivers for each individual sending cost element. Is the value split according to the apportionment defined in the process order?

Answer:
2-4-3 Display the cost accounting document from the list of accounting documents. Expand the document detail, and note that each actual line item posting to the order was settled to the two individual process order items, the co-products T-FF1## and T-FF3##.

2-4-4 Return to the cost report. Execute the report again, and review the affect of the preliminary settlement.

2-5 The calculation of work in process is necessary to determine the current order balance for the process order for T-FF1##.

2-5-1 Using the individual processing transaction, calculate the Work in Process value of your process order, using Results Analysis version 0 for the current period.

2-5-2 Create another session and display the cost report for your process order. Enter an * for the order item. Execute the report. Note the order balance. Compare the calculated total WIP amount with the remaining balance for your process. Are they the same value?
(circle one) Yes or No

2-5-3 Is it a requirement to value WIP at actual costs when using joint production?
(circle one) Yes or No

2-5-4 Record the WIP for T-FF1## and T-FF3##

T-FF1##:

T-FF3##

2-5-5 Access the WIP report and record the WIP value for each cost element for T-FF1##.

672111 (WIP direct costs):

672121 (WIP overhead):

672131 (WIP production costs):

2-5-6 Display the configuration of the WIP categories. What cost elements are assigned to the following WIP categories for Controlling area 1000, RA version 0:

EK(direct costs):

FK(production costs):

GK(overhead costs):
2-5-7 Display the actual report for T-FF1##. What are the total actual costs for the following WIP categories:

Actual costs EK: ______________
(400000 – 499999; 820000 – 894999; 896000 – 899999)

Actual costs FK: ______________
(600000 – 654999; 656000 – 699999)

Actual costs GK: ______________
(655100 – 655199)

Total Actual costs: ______________
Order balance: ______________

To determine how to allocate the remaining balance to the WIP categories, the total costs are divided by the actual costs per category. This determines the % of the remaining costs that should be allocated to each category.

Example:

Actual costs EK 8000 80% of Total
Actual costs FK 2000 20% of Total
Total costs 10000 100%

Remaining order balance after a partial delivery: 4000

Calculated WIP for each order category:

WIP category EK 3200
WIP category FK 800

2-6 Once the WIP has been calculated, the WIP balance must be posted to Financial Accounting for period-end closing. This is accomplished using the settlement transaction.

2-6-1 Using the individual processing transaction, settle the calculated WIP for your process order to financial accounting for the current period.

2-6-2 From the Actual Settlement Detail List note that each order item is a sender.

2-6-3 Display the settlement document for the posting to FI. Why isn’t there a Controlling document listed?

Answer:
Exercises

Unit: Product Cost by Order using Process Orders

Topic: Final Delivery and period-end closing

At the conclusion of this exercise, you will be able to:

- Cancel the WIP at the completion of the process order
- Execute variance analysis for the process order items and analyze the result
- Settle the WIP cancellation and order variance to Financial Accounting and the variance analysis to Profitability Analysis.
- Analyze the accounting documents created during settlement
- Review the customizing settings for the PA transfer structure

At the close of the previous period, the process order was not complete, and a WIP balance was calculated for the order items and transferred to Financial Accounting. The order has now been completed in the current period, so it will be necessary to cancel the remaining WIP balance. In addition, since the order is using the settlement type *Full*, variances can now be calculated and transferred to Profitability Analysis.

In preparation for the period-end closing activities, it will be necessary to enter the final confirmation for the order, and receive the remaining co-products so that the order status reflects *Final confirmation* and *Delivery Complete*.

3-1 The shop floor confirmation needs to be created to complete the production order. This transaction will cause additional simultaneous cost postings to the order.

3-1-1 Create the final confirmation for the process order. The remaining 500 liters have been completed. Also, an additional 1 hour processing time was necessary during the last phase. Change the duration to reflect the additional hour. While entering the confirmation, select the Final confirmation indicator. Save the confirmation.

3-1-2 Using movement type 101, enter a goods receipt for the remaining delivery of 500 liters of fertilizer, and 3.5 liters of sulfuric acid. Continue past the warning messages regarding the batch numbers. Use Next Screen to continue past the classification screen for the batch specifications for both materials, T-FF1## and T-FF3##.

3-1-3 Display the costreport for the order. Why are the actual costs for cost element 620000 (cost center 4250, activity type 1420) higher than the planned costs?

Answer:
Again it is necessary to execute the distribution for co-products prior to calculating either the WIP or variances for period-end.

Reverse the previous settlement for the process order.

Execute the individual processing of distribution for co-products for the process order for T-FF1##.

Return to the Plan/Actual Comparison report and review the affect of the distribution. How was the excess cost of the additional 1 hour of processing time distributed?

Since the order has the status final delivery, WIP must be calculated again in order to cancel the remaining WIP balance.

Using the individual processing transaction, calculate the Work in Process value of your process order, using Results Analysis version 0 for the current period.

Compare the calculated total WIP amount with the remaining balance for your process order. The WIP balance should be zero. The remaining balance on the process order will be considered manufacturing variance.

The process order should now contain the status final delivery and final confirmation. Since the settlement type for the order is ‘Full’, variance calculation can be executed.

Using the individual processing transaction, execute variance analysis for your process order. Calculate the variances for all target versions for the current period. Remain in the variance analysis detailed list display to answer the following question.

Select Cost elements for item 1 and display the variance report. What caused the variance for cost element 620000? Display the cost element report for item 2. Do both products recognize a variance for the processing duration?

After variances have been calculated, the variance categories can be settled to PA and the process order variance can be settled to FI. In addition, the WIP balance will be cancelled in FI.

Execute settlement for the process order. Use the current period and year.

Display the detail list for the settlement. The senders for production variances and the cancellation of WIP are listed on separate screens.

Access the settlement of the variances by selecting the receiver line for the material T-FF1##. The system displays a list of the variance amounts for PA by variance categories and for FI by material.

Select the accounting documents, and select the entry for Accounting document. What accounts were the postings made to?

Answer:
3-5-3 Return to the list of accounting documents, and access the profitability analyses document. Check the settlement to the value fields according to the variance category. Which value field was the variance settled to?

Answer:

3-5-4 From configuration, display the assignment of the value field for the resource usage variance category using PA transfer structure E1.
Solutions

Unit: Product Cost by Order using process orders
Topic: Master data and preliminary costing

1-1 Engineering has provided you with a master recipe for fertilizer that includes co-products. Both the production process and the materials are provided by plant 1100. Before you create a process order, verify the co-product data for the joint production process in the material master.

Favorites → Material Master → Material → Display → Display current

1-1-1 From the costing view of the material master record, verify that the leading co-product, T-FF1## in plant 1100, has been identified as a co-product.

Enter T-FF1##
Select Enter
Select Costing 1
Select Enter
Enter plant 1100
Select Enter
The co-product indicator is selected.

1-1-2 What co-product has been included in the joint production for T-FF1##? What is the apportionment of costs for T-FF1## and this co-product?

From the costing 1 view, select Joint production.
Select apportionment structure 0001, and select Equivalence numbers.
Co-product: T-FF3##
Materials:
Prod:
Misc:
The equivalence numbers are visible from the Equivalence numbers screen.

1-2 Create a process order for the production of the fertilizer, and analyze the master data used by cost object controlling for the joint production process.

Logistics → Production -Process → Process Order → Process Order → Create → With material.
Before continuing with this choose Add to favorites
1-2-1 Create a process order for 1000 liters of material T-FF1##, using production plant 1100, order type PI01. Use forward scheduling, and enter today’s date as the start date.

Enter material T-FF1##
Enter production plant 1100
Enter process order type PI01
Select Enter
Enter the quantity of 1000
Enter today’s date as the start date

1-2-2 Select Material list, and determine if the co-product indicator is active for material T-FF3##. If this indicator is not selected, will this material be managed as a co-product or by-product?

Select Material list
The co-product indicator is selected for T-FF3##.
If this is not selected, the material will be managed as a by-product.

1-2-3 From the process order header, display the settlement rule. Which receivers are entered, and why?

Goto → Header
Header → Settlement rule
Both T-FF1## and T-FF3## are entered as receivers.
This is due to the apportionment rule found in the material master for T-FF1##.

1-2-4 Which settlement type is entered? What are the consequences of this?

The settlement type is FUL = full settlement. This means that you can only calculate variances and settle the order when the status is either delivered (final) or technically complete. This settlement type corresponds to the controlling method Product Cost by Order.

1-2-5 Display the Control Data for the production order. What costing variants are entered for the planned and actual cost? How were the costing variants determined?

Exit the settlement rule by using the green arrow to go back.
Select the Control data view.
Planned costing variant: PPP1
Actual costing variant: PPP2
This was determined by the order type/plant defaults.
1-2-6 What costing sheet is assigned to the production order? How was the costing sheet determined?

Costing sheet: COGM

The costing sheet is located on the control data view. The costing sheet was determined by the valuation variant attached to the costing variant.

1-2-7 What overhead key is assigned to the production order? How is the overhead key determined?

Overhead key: SAP11

The overhead key is determined from the overhead group assigned to the material T-FF1## is the costing view of the material master.

1-2-8 Will the planned costs be calculated automatically when the order is saved?

Yes, the planned costs will be automatically calculated when the order is saved. This is determined by the planned cost calculation setting: Determine planned costs when saving.

1-2-9 Release the process order.

Select Release.

1-2-10 Save the process order. Record the order number. If prompted to assign a batch number to the co-products, enter A## for T-FF1##, and B## for T-FF1##.

Select Save.

1-3 Using the Order Cost report from the Product Cost by Order information system, review the calculation of the planned costs for the process order and verify the planned distribution of costs for the co-products.

Accounting → Controlling → Product Cost Controlling → Cost Object
Controlling → Product Cost by Order → Information System → Reports for
Product Cost by Order → Detailed Reports → For Orders

Settings → Order Items On/Off

Enter your order number.

Choose Execute

1-3-1 Using the setting Order Items On/Off, enter an * for order items, and determine what is the total planned debit for T-RF1##. Use the report layout ISAP02, Cost development to display the planned cost information.

The total planned debit for T-RF1## is displayed.

1-3-2 Execute the report again, but for only for order item 2, T-FF3##. What is the planned cost distribution to co-product T-FF3## for component T-RF1##?

The total planned debit for T-RF1## is displayed.
1-3-3 Is this consistent with the apportionment of material costs defined in the settlement rule of the process order?

Yes, this is consistent with the apportionment structure found in the settlement rule for the process order.
Solutions

Unit: Product Cost by Order using process orders
Topic: Simultaneous Costing and Period-end closing when order is not complete

2-1 Once the process order has been released to the shop floor, inventory transactions and confirmations can be posted for the process order. This will cause actual costs to be recorded on the process order.

2-1-1 Enter a final shop floor confirmation for operation/phase 230 of the process order. Enter a yield of 1000 liters and save the confirmation.

*Logistics → Production-Process → Process Order → Confirmation → Enter for phase → Time ticket*

Before continuing with this choose Add to favorites
Enter the order number and operation 230
Select Enter
Enter the confirmation type Final confirmation
Confirm a yield of 1000 Liters
Save the confirmation.

2-1-2 Enter a partial confirmation for 500 liters for operation/phase 330 of the process order.

*Favorites → Process Order → Confirmation → Enter for phase → Time ticket*

Enter the order number and operation 330
Select Enter
Enter the confirmation type Partial confirmation
Confirm a yield of 500 Liters
Save the confirmation.

2-1-3 Using movement type 101, enter a goods receipt for the delivery of 500 liters of fertilizer, and 3.5 liters of sulfuric acid.


Before continuing with this choose Add to favorites
Enter the movement type 101, the plant 1100, storage location 0001
Select To Order
Enter the process order number
Select enter
Change the quantity for T-FF1## from 1000 to 500, and change the quantity for T-FF3## from 7 to 3.5.
Select Adopt

Use Next Screen to continue past the classification screen for the batch specifications for both materials, T-FF1## and T-FF3##. Press Enter to continue past the warning messages regarding the PU quantity.

Save the goods receipt.

2-2 Using the order cost report from Product Cost by Order Report Tree review the actual cost information for the proceeding transactions.

Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Order → Information System → Reports for Product Cost by Order → Detailed Reports → For Orders

Enter your order number.

2-2-1 To display the actual costs for the sulfuric acid T-FF3##, use the cost report and enter the process order number. Next, change the Settings to Order Items On/Off and enter order item 2, and execute the report. Display the cost report and determine the value used to credit the process order for the goods receipt for the sulfuric acid T-FF3##.

Settings → Order items → On/Off
Enter order item 2
Choose Execute

The value for the credit is displayed under cost element 895000.

2-2-2 Execute the actual cost report again, this time displaying the costs for the fertilizer, order item 1. Determine the value used to credit the process order for the goods receipt for the fertilizer T-FF1##.

Enter order item 1
Choose Execute

The value for the credit is displayed under cost element 895000.
Lastly, to display the actual costs for all items in the order, execute the report again but enter an * for the order item. Record the order balance.

Enter order item *
Choose Execute
Record the order balance

Using the Cost development layout, determine if actual costs have been distributed to T-FF1##.

Choose Select Layout
Choose Layout 1SAP02
There are no actual costs listed for the activities, overheads or materials. These costs have not been distributed to the co-products, yet.

Complete the process and overhead cost allocation for the process order.

Using the individual processing transaction for Process Cost Allocation, apply the actual process cost to the process order for version 0 of the current period.

Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Order → Period-End Closing → Single Functions → Template Allocation → Individual Processing

Before continuing with this choose Add to favorites
Enter your order number
Version 0
Period: Current month
Fiscal Year: current year
Deselect Test run
Select Detailed list
Choose Execute

Using the individual processing transaction for Overhead Calculation, apply the overhead costs to the process order for the current period.

Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Order → Period-End Closing → Single Functions → Overhead → Individual Processing

Before continuing with this choose Add to favorites
Enter your order number
Period: Current month
Fiscal Year: current year
Deselect Test run
Choose Execute
If using joint production, it is possible to calculate WIP and variances for the individual co-products. However, to enable this, the actual costs for the order must be distributed to the co-products prior to calculating either the WIP or variances for period-end.

*Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Order → Period-End Closing → Single Functions → Preliminary Settlement for Co-products, Rework → Individual Processing*

**Before continuing with this choose Add to favorites**

2-4-1 Execute the individual processing of preliminary settlement for co-products for the process order for T-FF1## for the current period. Answer the following 2 questions prior to leaving the preliminary settlement results screen.

- **Enter your order number**
- **Settlement period: Current month**
- **Posting period: Current month**
- **Fiscal year: Current year**
- **Deselect Test run**
- **Choose Execute**

2-4-2 Select the detail list for the actual settlement, and display the sender. The individual cost elements that debited the process order are listed as the senders. Next, access the receivers. The settlement receivers should list the order items (co-products) as the receivers for each individual sending cost element. Is the value split according to the apportionment defined in the process order?

- **Select Detail lists**
- **The order number and order items are displayed**
- **Select the order number**
- **Select Sender**
- The individual cost elements that debited the process order are displayed
- **Use the green arrow back and return to the detail list**
- **Select Receiver**
- The order items are displayed, listed by assignment
- Yes, the value is split according to the apportionment structure:
2-4-3 Display the cost accounting document from the list of accounting documents. Expand the document detail, and note that each actual line item posting to the order was settled to the two individual process order items, the co-products T-FF1## and T-FF3##.

Use the green arrow back and return to the detail list
Select Accounting documents
Choose Cost accounting docs
Expand the document line

2-4-4 Return to the cost report. Execute the report again, and review the affect of the preliminary settlement.

Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Order → Information System → Reports for Product Cost by Order → Detailed Reports → For Orders

Enter your order number
Choose Execute
The settled costs to the order items are displayed as credit entries for each cost element.

2-5 The calculation of work in process is necessary to determine the current order balance for the process order for T-FF1##.

2-5-1 Using the individual processing transaction, calculate the Work in Process value of your process order, using Results Analysis version 0 for the current period.

Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Order → Period-End Closing → Single Functions → Work in Process → Individual Processing → Calculate

Before continuing, select Add to Favorites
Enter your order number
WIP to Period: Current month
Fiscal Year: current year
Results Analysis version 0
Deselect test run
Choose Execute
2-5-2 Create another session and display the cost report for your process order. Enter an * for the order item. Execute the report. Note the order balance. Compare the calculated total WIP amount with the remaining balance for your process. Are they the same value?

Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Order → Information System → Reports for Product Cost by Order → Detailed Reports → For Orders

Settings → Order items → On/Off

Enter your order number.
Enter order item *

Choose Execute

Yes, the calculated WIP and the actual order balance are the same value.

2-5-3 Is it a requirement to value WIP at actual costs when using joint production?

Yes, it is required to value WIP at actual costs when using joint production.

2-5-4 Record the WIP for T-FF1## and T-FF3##.

The WIP for each item is listed in the Work in Process: List.

2-5-5 Access the WIP report and record the WIP value for each cost element for T-FF1##.

From the WIP list:

GOTO → WIP Report

2-5-6 Display the configuration of the WIP categories. What cost elements are assigned to the following WIP categories for Controlling area 1000, RA version 0:

Favorites → Tools → Accelerated SAP → Customizing → Edit Project

Choose SAP Reference IMG

Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Order → Period-End Closing → Work in Process → Define Assignment

EK(direct costs): 400000 – 499999; 820000 – 894999; 896000 – 899999
FK(production costs): 600000 – 654999; 656000 – 699999
GK(overhead costs): 655100 – 655199
Display the actual report for T-FF1##. What are the total actual costs for the following WIP categories:

Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Order → Information System → Reports for Product Cost by Order → Detailed Reports → For Orders

Enter your order number.

Enter order item 1

Choose Execute

Actual costs EK: ____________
(400000 – 499999; 820000 – 894999; 896000 – 899999)
Actual costs FK: ____________
(600000 – 654999; 656000 – 699999)
Actual costs GK: ____________
(655100 – 655199)
Total Actual costs: ____________
Order balance: ____________

To determine how to allocate the remaining balance to the WIP categories, the total costs are divided by the actual costs per category. This determines the % of the remaining costs that should be allocated to each category.

Example:

Actual costs EK 8000 80% of Total
Actual costs FK 2000 20% of Total
Total costs 10000 100%

Remaining order balance after a partial delivery: 4000

Calculated WIP for each order category:

WIP category EK 3200
WIP category FK 800
2-6 Once the WIP has been calculated, the WIP balance must be posted to Financial Accounting for period-end closing. This is accomplished using the settlement transaction.

Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Order → Period-End Closing → Single Functions → Settlement → Individual Processing

Before continuing, select Add to Favorites

2-6-1 Using the individual processing transaction, settle the calculated WIP for your process order to financial accounting for the current period.

Enter your order number
Settlement Period: Current month
Posting Period: Current month
Fiscal Year: current year
Deselect Test run
Select Execute

2-6-2 From the Actual Settlement Detail List note that each order item is a sender.

Choose Detail lists
If necessary, choose GOTO → Detail list of accrual data for FI

2-6-3 Display the settlement document for the posting to FI. Why isn’t there a Controlling document listed?

The WIP accrual to FI does not credit the order. The WIP balances are stored in RA cost elements, which will not update the controlling object. This can be verified by displaying the sender and receiver for the settlement.

Select one of the process order items
Select Accounting documents
From the list of accounting documents, choose Accounting document. This is the WIP accrual posting in FI.

893000 Inventory in process
793000 WIP
Solutions

Unit: Product Cost by Order using Process Orders
Topic: Final Delivery and period-end closing

3-1 The shop floor confirmation needs to be created to complete the production order. This transaction will cause additional simultaneous cost postings to the order.

3-1-1 Create the final confirmation for the process order. The remaining 500 liters have been completed. Also, an additional 1 hour processing time was necessary during the last phase. Change the duration to reflect the additional hour. While entering the confirmation, select the Final confirmation indicator. Save the confirmation.

**Favorites → Process Order → Confirmation → Enter for Phase → Time Ticket**

- Enter the order number and operation 330
- Select Enter
- Enter the confirmation type Final confirmation
- Confirm a yield of 500 Liters
- Confirm a duration of 1 additional hour.
- Save the confirmation.

3-1-2 Using movement type 101, enter a goods receipt for the remaining delivery of 500 liters of fertilizer, and 3.5 liters of sulfuric acid. Continue past the warning messages regarding the batch numbers. Use Next Screen to continue past the classification screen for the batch specifications for both materials, T-FF1## and T-FF3##.

**Favorites → Environment → Material Movement → Post Material to Stock.**

- Enter the movement type 101, the plant 1100, storage location 0001
- Select To Order
- Enter the process order number
- Select enter
- Confirm the quantity for T-FF1## as 500 liters and the quantity for T-FF3## as 3.5 liters.
- Save the goods receipt.
Press Enter to continue past the warning messages regarding the batch number.

Use Next Screen to continue past the classification screen for the batch specifications for both materials, T-FF1## and T-FF3##.

3-1-3 Display the cost report for the order. Why are the actual costs for cost element 620000 (cost center 4250, activity type 1420) higher than the planned costs?

Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Order → Information System → Reports for Product Cost by Order → Detailed Reports → For Orders

Enter your order number
Choose Execute
Select Choose Layout
Select the Cost development layout

The actual costs are higher than the planned costs due to the additional 1 hour of duration that was confirmed for operation 330.

3-2 Again it is necessary to execute the distribution for co-products prior to calculating either the WIP or variances for period-end.

Favorites → Preliminary Settlement for Co-products, Rework → Individual Processing

3-2-1 Reverse the previous preliminary settlement for the process order.

Enter your order number
Settlement period: Current month
Posting period: Current month
Fiscal year: Current year
Deselect Test run
Preliminary Settlement → Reverse

3-2-2 Execute the individual processing of distribution for co-products for the process order for T-FF1##.

Enter your order number
Settlement period: Current month
Posting period: Current month
Fiscal year: Current year
Deselect Test run
Choose Execute
3-2-3 Return to the Plan/Actual Comparison report and review the affect of the distribution. How was the excess cost of the additional 1 hour of processing time distributed?

Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Order → Information System → Reports for Product Cost by Order → Detailed Reports → For Order

Enter your order number

Choose Execute

Notice the credit entries listed by order item for each cost element.
The value for the additional 1 hour of labor was split according to the apportionment structure for production costs: 5:3.

3-3 Since the order has the status final delivery, WIP must be calculated again in order to cancel the remaining WIP balance.

3-3-1 Using the individual processing transaction, calculate the Work in Process value of your process order, using Results Analysis version 0 for the current period.

Favorites → Work in Process → Individual Processing → Calculate

Enter your order number

WIP to Period: Current month

Fiscal Year: current year

Results Analysis version 0

Deselect Test run

Choose Execute

3-3-2 Compare the calculated total WIP amount with the remaining balance for your process order. The WIP balance should be zero. The remaining balance on the process order will be considered manufacturing variance.

Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Order → Information System → Reports for Product Cost by Order → Detailed Reports → For Order

Settings → Order items → On/Off

Enter your order number.

Enter order item *

Choose Execute

The calculated WIP balance is 0, yet there is a remaining order balance due to the labor variance from the confirmation of operation 330.
3-4 The process order should now contain the status final delivery and final confirmation. Since the settlement type for the order is ‘Full’, variance calculation can be executed.

Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Order → Period-End Closing → Single Functions → Variances → Individual Processing

3-4-1 Using the individual processing transaction, execute variance analysis for your process order. Calculate the variances for all target versions for the current period. Remain in the variance analysis detailed list display to answer the following question.

Enter your order number
Period: Current month
Fiscal Year: current year
Choose All target cost versions
Deselect Test run
Choose Detail list
Choose Execute

3-4-2 Select Cost elements for item 1 and display the variance report. What caused the variance for cost element 620000? Display the cost element report for item 2. Do both products recognize a variance for the processing duration?

Select the order item
Choose Cost Element
The cost element variance report is displayed
The variance for cost element 620000 was caused by the additional 1 hour that was confirmed for operation 330.
Display the cost element report for T-FF3##.
Use the green arrow and go back to the Variance calculation list.
Select the second order item
Choose Cost Element
The cost element variance report is displayed
Yes, both products recognize a variance for the processing duration.

3-5 After variances have been calculated, the variance categories can be settled to PA and the process order variance can be settled to FI. In addition, the WIP balance will be cancelled in FI.

Favorites → Single Functions → Settlement → Individual Processing
3-5-1 Execute settlement for the process order. Use the current period and year.

Enter your order number

Settlement Period: Current month
Posting Period: Current month
Fiscal Year: current year
Deselect Test run
Select Execute

3-5-2 Display the detail list for the settlement. The senders for production variances and the cancellation of WIP are listed on separate screens.

Access the settlement of the variances by selecting the receiver line for the material T-FF1##. The system displays a list of the variance amounts for PA by variance categories and for FI by material.

Select the accounting documents, and select the entry for Accounting document. What accounts were the postings made to?

Choose Detail lists

If necessary, choose GOTO → Detail list of settled values
Select the first order item
Choose Receiver

The variance amounts for PA are listed by variance categories, and the variance amount for FI is listed by material.

Use the green arrow back to return to detail list
Select Accounting documents
Select the entry for Accounting document

- 895000 Factory Output of production
- 231500 Expense price differences
- 893000 Inventory in process
- 793000 WIP

3-5-3 Return to the list of accounting documents, and access the profitability analyses document. Check the settlement to the value fields according to the variance category. Which value field was the variance settled to?

Select Profitability Analysis
Select the tab Value fields

Use the next page icon through the PA document until the value field for the variance is visible.
3-5-4 From configuration, display the assignment of the value field for the resource usage variance category using PA transfer structure E1.

Favorites → Tools → Accelerated SAP → Customizing → Edit Project

Choose SAP Reference IMG

Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Order → Period-End Closing → Settlement → Create PA Transfer Structure

Select PA transfer structure E1

Select Assignment lines

Select Assignment 40 (resource usage variance)

Select value field

The value field VV330 is displayed.
Schedule Manager

- Benefits of the Schedule Manager
- Task list
- Flow definition
- Job monitor
- Worklist monitor
At the conclusion of this unit, you will be able to:

- Describe the benefits of the Schedule Manager
- Explain what a task list is
- Explain what a flow definition is
- Describe the use of the job monitor
- Discuss how to efficiently perform the period-end closing activities using the multilevel worklist
- Explain how to process the faulty objects with the worklist monitor
You would like to perform the period-end closing activities in *Product Cost by Order* and *Product Cost by Period* quickly and efficiently.

You perform the following functions in the period-end closing process:
- Overhead calculation
- WIP calculation
- Variance calculation
- Settlement

These functions are executed in the background. You would like to link the background jobs together and analyze the errors after all functions have been performed.
Schedule Manager: Components I

- **Scheduler**: The scheduler enables you to monitor company processes such as period-end closing. Components of the scheduler:
  - **Task list**: A structured arrangement of tasks that are performed in each period and possibly by multiple users. For example, a task list can be created for the period-end closing process in CO.
  - Daily overview
  - Monthly overview
- **Flow definition**: A flow definition consists of individual flow steps. These steps include scheduling programs with variants as jobs in the R/3 System, and user interactions that send users information in mails. Flow definitions are tasks scheduled in the task list.

The Schedule Manager simplifies the period-end closing process. The Schedule Manager is a cross-application tool for functions that are performed periodically. The Schedule Manager provides the following basic functions:
- Definition and scheduling of the processing steps.
- Monitoring jobs and checking the results.
- Efficient error rectification.

The Schedule Manager can also be used independently of the *Product Cost by Period* and *Product Cost by Order* components.

The scheduler enables you to schedule your tasks in a tree structure and have them executed at a particular time by dragging them into a daily overview.

The flow definition links the single functions together. You can schedule a flow definition as a task in the scheduler. SAP supplies standard flow definitions that you can adapt to meet your particular requirements.
**Schedule Manager: Components II**

- **Job Monitor**: Monitor containing information on the jobs executed, such as statuses and messages.

- **Multilevel Worklist**: A multilevel worklist is generated for a sequence of processing steps and not for an individual processing step. The sequence of processing steps is specified in the flow definition.

- **Worklist Monitor**: Monitor in which the multilevel worklist can be edited. You can:
  - Analyze the messages for each object and function
  - View the processing status set by the system for each object and function
  - Manually override the processing status set by the system for each object and function

---

- The job monitor enables you to monitor the scheduled tasks during and after processing.

- The multilevel worklist is available for: Product cost collectors, production orders, process orders, cost object hierarchies, general cost objects (Costs for Intangible Goods and Services), internal orders, and WBS elements. The selection scope is determined only once and applies to all processing steps. The worklist includes all objects in the selection scope for which processing in the current processing step is both allowed and necessary. The selection scope therefore corresponds to the maximum scope of the worklist. Restrictions on the selection scope can be specified for individual processing steps. These restrictions are normally specified in the selection profiles that are defined when the report variant is created.

- The processing steps are executed in the sequence specified in the flow definition in the scheduler. A processing status is shown in the worklist for each object and processing step. The processing status indicates whether the object can be processed in the next processing step. A given processing step contains only the objects that can be processed in that step based on the processing status of the previous step.

- Dependencies between objects are interpreted as user-specific for each processing step. For example, in order to process a given object in a given step, the system may have to process additional objects. The system automatically takes such dependencies into account. You do not have to make any additional settings.
The period-end closing process is straightforward and easy to perform.

Automatic execution of processing steps and interactive communication through workflow techniques

Comprehensive monitoring of the period-end closing process

Worklist monitor speeds error analysis and rectification

Fast processing time thanks to a multilevel worklist

The multilevel worklist reduces the time required to process sequences of processing steps (such as in period-end closing):

- Manual interaction after completion of a job is not necessary. This interaction now takes place after execution of a sequence of processing steps that comprises multiple jobs (such as after the period-end close for an application component).
- With the multilevel worklist, processing steps are only repeated for the objects that actually had errors.
- CPU time is reduced because objects are selected only once for an entire processing step sequence rather than for each processing step. The objects are selected before the first processing step is performed. Performance is particularly improved with complex structures that involve dependencies between objects (such as complex projects).
- Job scheduling and monitoring is usually the responsibility of the data processing department. However, the data processing department is not necessarily responsible for correcting the errors listed in the error logs. The multilevel worklist enables you to directly notify the employees responsible for correcting the faulty objects. This notification is made in mails that are sent automatically on the basis of the workflow.
In the task list, you define the arrangement of tasks that are performed in each period and possibly by multiple users. You can define programs for periodic background processing or programs for online processing.

- You can attach Microsoft Office documents that are required for processing a particular task directly to the task. You can also create simple texts as documentation for a task.

- The daily overview shows the upcoming and completed tasks of the day. From the daily overview, you can access detailed information on a task.

- With the Schedule Manager, you can create a structured view of the tasks to be performed. The tasks can be performed by period and by more than one user. You can use a number of different task types in the task list:
  - Background job chains (= flow definition)
  - Individual background jobs (= program with variant)
  - Online programs and transactions
  - Notes as placeholders to describe a task that is not processed in the SAP System (such as "Inform John").
- The flow definition consists of individual flow steps. These steps include scheduling programs with variants as jobs in the SAP System, and user interactions that send users information in mails.

- User-specific requirements regarding the interface of the flow definition can be realized with workflow profiles. If required, such profiles can be created and supplied with the support of the project team. To enable individual processes to be available as flow steps, a report program is required that feeds the processing parameters and has an ergonomic interface.
The job monitor provides you with all information on an active or finished job that was planned in the scheduler. To determine the status of currently running jobs, you can repeat the database selection. If you only want to see jobs of a certain status, you can hide all other jobs. The monitor is divided into three areas:

- **Structure tree**: The selection area shows you the workflows arranged in chronological order (expanded into substeps) and the jobs that were run within a particular time period. You receive information on the status of the jobs, the runtime, and the update level. For detailed information on a job, double-click on the desired entry in the structure tree. Use the right mouse key to see the different functions that are available for this job, such as restarting a report program or accessing the monitor for the multilevel worklist.

- **Detail view of a job**: In the overview area, you can double-click on a job to display more detailed information: Spool list (display of batch spool list(s)), job log (display of the job log for the batch job), extract (online display of the saved results lists), basic list (online display of a saved short list containing the most important information).

- **Message list**: If messages were issued for a job and saved, the system displays them in the detail area.
You can view the processed objects (for example, product cost collectors or production orders) in the **monitor of the worklists**. The system indicates the processing status for each object and processing step.

The object list and the message list provide you with the necessary information on any errors that occurred during processing. You can:

- Analyze the errors.
- Correct the errors.
- Set a manual processing status that tells the system that the error is negligible and the object can continue to be processed.
- Set a manual processing status that tells the system that objects processed without errors should nevertheless be processed again (such as when follow-up costs were incurred).

Once you have processed all objects in the monitor, you start the processing again. Only the objects that had errors (and any for which processing was forced manually) are processed.
The Schedule Manager simplifies the period-end closing process.

The multilevel worklist of the Schedule Manager enables efficient error analysis.

The multilevel worklist significantly improves performance in the period-end closing process.

Flow definitions are a prerequisite for the use of the multilevel worklist.
Information System - Contents

- Preface
  - Information System as Decision Support Tool
  - Business Scenario
- Structure of the Information System
- Summarized Analysis
  - Product drilldown
  - Summarization hierarchy
- Order Selection
- Using the ABAP List Viewer to Format Lists
- Using Extracts
At the conclusion of this unit, you will be able to:

- Describe the structure of the information system
- Explain how to use standard reports for efficient cost controlling
- Analyze aggregate data using product drilldowns and summarization hierarchies
- Format lists with the APAP List Viewer
- Use extracts
Information System: Course Overview

AC510

Introduction

Material Valuation

Product Cost by Period

Product Cost by Order

Schedule Manager

Course Overview

Appendix

Information System

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What actual costs did we incur in our plant in the current period?

What costs were we expecting based on the quantity actually manufactured?

Are some product groups significantly more cost-effective to produce than others?

What was the cause of the variances?

What is the value of the unplanned scrap?

Have our continuous improvement efforts had any effect on costs?
The information requirements in Cost Object Controlling are supported by interactive top-down reporting techniques. The information necessary for decision making is provided for the specific level of business analysis required, such as product groups, product levels, or orders (product cost collectors or manufacturing orders). You can branch to object lists from the individual summarization levels.

A typical path of analysis is to access plant data from an object list. For example, you can use order selection to generate a list of all orders that fulfill certain conditions (such as all orders for which the production variances exceed 10% in a particular plant for a particular material). From the list, you can access detailed reports for the individual orders.
A company wants an overview of the reports available in the standard system.

The company wants to analyze costs for summarized data and move down to increasingly detailed levels using drilldown techniques.

The company also wants to generate lists of orders that fulfill certain conditions, such as all orders for a particular material.
Road Map - Information System

- Structure of the Information System
- Summarized Analysis
  - Product drilldown
  - Summarization hierarchy
- Order Selection
- ABAP List Viewer
- Extracts
In Cost Object Controlling there is a branch of the information system for each subcomponent:

- Product Cost by Period
- Product Cost by Order
- Product Cost by Sales Order
- Costs for Intangible Goods and Services

The reports are grouped into the following report categories in each component:

- Summarized Analysis
- Object List
- Detailed Reports
- More Reports

The report contents indicate the key figures the report provides data on, such as work in process or actual costs. The same report content can appear in several different report categories. For example, the report content work in process can be used in the two report categories Detailed Reports and Summarized Analysis.

The report data can be displayed with various reporting tools.
The information system provides a number of different report categories for various analysis purposes.

In the **Summarized Analysis** category, you can use the following tools:

- Product drilldown
- Summarization hierarchy
- Cost object hierarchy

Product drilldowns and summarization hierarchies are used only for reporting purposes. Cost object hierarchies are hierarchies to which values can be updated (see *Product Cost by Period*). In addition to the costs assigned to the individual cost object hierarchies, you can also see the summarized costs for each cost object node.

To be able to see summarized costs, you must first perform a data collection run.

The report category **Object List** shows you the cost objects that meet defined criteria (such as all orders of a particular order type).

The report category **Object Comparisons** enables you to compare objects with each other. For example, you can compare the data of two product cost collectors.

The report category **Detailed Report** displays the data for a single cost object (such as a product cost collector).
Road Map: Information System

- Structure of the Information System
- Summarized Analysis
  - Product drilldown
  - Summarization hierarchy
- Order Selection
- ABAP List Viewer
- Extracts
A product drilldown is a flexible analysis tool. You can navigate between the summarization levels for which you want to analyze aggregate data. Example:

- Suppose you manufacture chocolate candies and chocolate in your Munich plant. You analyze the data in the Munich plant by comparing the product groups chocolate candies and chocolate with each other.
- Suppose you manufacture chocolate candies both in Munich and Triest. You analyze the product group chocolate candies by comparing the Munich plant with the Triest plant.

In product drilldowns, you can easily navigate and drill down to lower levels. For example, the following functions are available:

- Exceptions
- Sorting

In contrast to summarization hierarchies, product drilldowns use predefined summarization levels.
In the standard system, product drilldowns use the following summarization levels:

- Plant, product group, period/year (only for periodic reports), cost component.

You can view the orders for a material from the summarization level *material*. From this object list, you can access detailed reports for the individual orders.
Each product drilldown report can be used in periodic or cumulative form.

In periodic drilldowns, the key figures are shown by period. This enables fast navigation across multiple periods. Periodic drilldown reports are appropriate when you are interested in comparing different months. You can analyze up to 16 periods.

With cumulative drilldown reports, you can summarize key figures across multiple periods. For example, you can analyze the key figures by quarter or fiscal year.
You can use the following product group types in product drilldowns:

- Product hierarchy from material master (multilevel).
- Material group from material master (single-level).
- CO product groups (multilevel or single-level). CO product groups must be created manually.

You select the product group type in Customizing for Product Cost Controlling under Information System › Maintain Report Parameters for Product Cost Controlling. There you also enter the cost component structure to be used to display cost components.

You enter the CO product group in the menu of Product Cost by Period or Product Cost by Order under Information System › Tools › Summarized Analysis. You assign materials to the lowest CO product group in the hierarchy. You create a hierarchy by assigning product groups to levels above or below other product groups.
To select the data for your drilldown reports, you must perform a data collection run. The selected dataset is saved. You access the saved dataset when you execute the report.

You can execute data collection for a single plant or for all plants in a controlling area.

You can also select the summarization dates. Summarizing the values between these dates overwrites any previously saved datasets. Summarized values that are outside the summarization time frame are retained.

SAP recommends choosing summarization dates that include all open periods in financial accounting.

To accelerate data collection, you can use parallel processing to execute the process on multiple servers simultaneously.
Road Map: Information System

- Structure of the Information System
- Summarized Analysis
  - Product drilldown
  - Summarization hierarchy
- Order Selection
- ABAP List Viewer
- Extracts
A summarization hierarchy enables you to summarize data according to your requirements. A summarization run generates totals for each node of the summarization hierarchy. The system summarizes planned costs, target costs, actual costs, variances, and work in process for all orders summarized.

The summarization data for each node is saved, and can be viewed at any time.

In Customizing, you can define status-dependent selection conditions for summarization. For example, you can exclude from summarization those orders that do not have any actual costs, or summarize only the orders for which you have calculated variances. You use a status selection profile to do this.

You can also define exception rules so that a traffic light symbol warns you whenever a predefined threshold value is exceeded (such as production variances above 10%). This helps you find the nodes you want to analyze.
From the summarization report, you can access additional reports such as an object list or a cost element report.

You can define exceptions for analysis purposes. On the basis of exception rules, yellow and red traffic light symbols appear next to values that exceed specified limits.

It is recommended that you analyze in detail the orders for which threshold values were exceeded.
Customizing for Summarization Hierarchies (1)

∑ Summarized Analysis

- Create summarization hierarchy
- Specify whether input quantities are summarized
- Determine objects to be summarized (such as product cost collectors) with Data Scope (Object Types)
- Specify status selection profile
- Determine data to be summarized (such as primary costs, secondary costs, variances) with Data Scope Material number (Totals Records Tables)
- Determine hierarchy levels, such as:
  - Controlling area
  - Plant
  - Order type
  - Material number

For the summarization hierarchy, use master data fields of the account assignment objects. Each level of the summarization hierarchy corresponds to a master data field. It is not necessary to use classification.
If you are using co-products, you should distribute the actual costs before analysis.

You specify the scope of summarization. For performance reasons it may be necessary to restrict the scope of the summarization.

Function module exit EXIT_SAPLKKRB_001 in SAP enhancement SAPLKKRB enables you to reassign, delete, or add objects after selection for a summarization run but before actual data collection begins. This enhancement is documented. For documentation on the exit, use the pushbutton *SAP doc.* in the enhancement transaction (CMOD).
Road Map: Information System

- Structure of the Information System
- Summarized Analysis
  - Product drilldown
  - Summarization hierarchy
- Order Selection
- ABAP List Viewer
- Extracts
## Selection of Orders By:

<table>
<thead>
<tr>
<th>Master data</th>
<th>Plant</th>
<th>Material Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variances</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Threshold Values</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Exception)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 5%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Order Status

<table>
<thead>
<tr>
<th>Product Cost Collector</th>
<th>Status VCAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tgt</td>
<td>Act</td>
</tr>
<tr>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>S</td>
<td>S</td>
</tr>
</tbody>
</table>

### Selected Orders
- Planned costs
- Actual costs
- Target costs
- Work in process
- Scrap
- Input quantity variance
- Input price variance
- Scrap variance
- ...
The status selection profile can be used in order selection and in summarized analysis.

When you use a status selection profile, the system only selects the orders that have a certain system status or user status.

You can use AND and OR operations in the status selection profile.
The order status is evaluated during data collection.

You should define the time frame of data collection to include the entire life of the order.

For example, if you select orders for which variances have been calculated in period 3 and that were charged with actual costs in period 1, the orders are selected for summarization in period 3 if a corresponding status selection profile is used. However, if you summarize only periods 2 and 3, the costs of period 1 will not be included.

When you use a status selection profile, therefore, all open FI periods should be included in the selection.
Road Map: Information System

- Structure of the Information System
- Summarized Analysis
  - Product drilldown
  - Summarization hierarchy
- Order Selection
- **ABAP List Viewer**
- Extracts
The functions available in the ABAP List Viewer include the following:

- Totals
- Subtotals
- Filter
- Sorting
- ABC analysis
- Cost element report
- Send

You can download the report data:

- As a spreadsheet
- For text processing
- In HTML format

You can print reports in the background for selected orders. To do this, choose Goto > Background Report in the lists.
You can have sums calculated for the displayed figures. For example, the system can display the sum of all target costs and all actual costs.

You can then have a subtotal calculated for a column. Subtotals are often useful for the Material column, for example. A subtotal is calculated for each material in this case.
You can change the appearance of a list using display variants.

You can:

- Choose which fields are displayed
- Change the order in which the fields are displayed
- Modify the column width

There are two types of display variants:

- Customer-specific display variants that are accessible to all users
- Customer-specific display variants that are accessible only to the users who created them (user-specific variants)
Road Map: Information System

- Structure of the Information System
- Summarized Analysis
  - Product drilldown
  - Summarization hierarchy
- Order Selection
- ABAP List Viewer
- Extracts
To reduce runtime, you can generate report extracts and use them until the report is generated again. A report extract contains the report data that was generated the last time the report was run.

- If you make changes in the selection parameters (for example, selecting by product group instead of by material), you must create new report extracts. You must also do so after release upgrades.
You are now able to:

- Explain the structure of the information system for *Product Cost Controlling*.
- Explain how to use standard reports for efficient cost controlling
- Analyze aggregate data using product drilldowns and summarization hierarchies
- Format lists with the ABAP List Viewer
- Use extracts
Exercises

Unit: Information System

At the conclusion of this exercise, you will be able to:

- Use the summarization reports to quickly identify products that require additional analysis
- Execute a drill-down analysis and navigate to the cost object detail reports
- Create a summarization hierarchy and execute a summarization analysis using this hierarchy
- Utilize order selection reporting with exception analysis to identify orders that meet specific criteria
- Use the report to report interface to navigate from one report to another report
- Alter a list display using ABAP List Viewer (ALV)

As a member of the product cost controlling department, you will have the responsibility to analyze production results. Due to large volume of products and orders, you will not be reviewing the results of each individual product cost collector or production order. You will need to effectively use the summarization reporting methods to identify products and cost objects that need further attention and analysis.

You have been asked to use each of the different analysis methods and evaluate how to use exception rules, sorting and drill-down methods to analyze the results. In addition, you will need to be able to navigate from a summarization result to the detail reports to review specific cost objects.

1-1 The first analysis will be using the target to actual aggregated drill-down report to identify which products are incurring the highest variances within controlling area 1000. Select the Target cost version to 0 and Results Analysis version 0 prior to executing the report. Do not limit the report selection by plant. Restrict the analysis to the last 12 periods and answer the following questions:

1-1-1 Determine the product group with the highest total variances in plant 1100.
1-1-2 Determine the product group with the highest total variances in plant 1000.
1-1-3 What material received the highest variances in plant 1000?
1-1-4 What cost objects caused the variances for this material.

1-2 Using order summarization, it is possible to create new summarization hierarchies for alternate analysis requirements. You will need to create a new order.
summarization hierarchy in customizing, and then test this by analyzing the costs for T-FF1##, T-B4## and T-F1##.

1-2-1 Using the IMG, create a new hierarchy that summarizes orders using the following levels:

Level 1: Controlling area
Level 2: Material group
Level 3: Material number
Level 4: Created by (user id)

Name your new hierarchy AC510-##. In addition to the costs, have the quantities summarized.

1-2-2 Perform data collection for your hierarchy. Restrict the From and To period to the previous month and the current month of the current fiscal year. Perform the summarization online, and attach an existing exception rule for analyzing the target costs to the actual costs.

1-2-3 Display the summarized data for hierarchy AC510-## using the plan to actual comparison hierarchy report. The plan to actual costs for the summarized hierarchy are displayed. From the report output, navigate to the material group metal processing, then material T-B4##. Next, navigate to the detailed reports for the product cost collectors by selecting the user ID. Repeat this procedure for chemicals and T-FF1##.

1-3 The order selection report will demonstrate the ability of the system to highlight orders that meet specific exceptions, such as a 20% variance between planned and actual cost. In addition, the order list can be limited to only display orders within a certain time period, and that meet a specific condition or status, such as variances calculated.

1-3-1 Using the order selection report, select the production orders for material T-FF100 to T-FF330, plant 1100, using order type PI01. Set the threshold values to restrict the time period for selection from 01/1998 to the current period. Lastly, define the exception to highlight the orders that have a cost variance against percent above 20%, and use the yellow for those whose variance is above 10%. Do not restrict the selection by status.

1-3-2 From the report output, display the different views of the report.

1-3-3 Using the order comparison report, select any two orders from the list and branch to the comparison report. Accept the default report parameters for the actual order report. After reviewing the comparison report, return to the order list.

1-3-4 Return to the Order Selection Results List and select one of the orders, and call up the planned/actual comparison report. Change the from Fiscal year to 1998, for the report parameters. Select a cost element that has actual costs and display the line items.

1-3-5 The output for the line item report can be altered by using ALV. Using the ALV settings, remove the name of the offsetting account from the list and add the posting date. It is not necessary to save this layout.
Solutions

Unit: Information System

1-1  The first analysis will be using the target to actual aggregated drill-down report to identify which products are incurring the highest variances within controlling area 1000. Select the Target cost version to 0 and Results Analysis version 0 prior to executing the report. Do not limit the report selection by plant. Restrict the analysis to the last 12 periods and answer the following questions:

Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Order → Information System → Reports for Product Cost by Order → Summarized Analysis → With Product Drilldown → Variance Analysis → Target/Actual Production Variances → Cumulative

Do not enter a plant

Enter the from and to period covering the last 12 periods.

Execute

1-1-1 Determine the product group with the highest total variances in plant 1100.

From the report display, double-click on plant 1100, and the product group costs will be immediately displayed.

1-1-2 Determine the product group with the highest total variances in plant 1000.

To navigate to plant 1000, select the previous value icon within the navigation window.

1-1-3 What material received the highest variances in plant 1000?

To display the materials with the highest variances, double-click on material within the navigation window. Next, select the column for variances, and using the right mouse button, select Sort in descending order.

1-1-4 What cost objects caused the variances for this material.

To display the cost objects for a material, select the material line, then select Call up report. The order list will be displayed.

1-2 Using order summarization, it is possible to create new summarization hierarchies for alternate analysis requirements. You will need to create a new order summarization hierarchy in customizing, and then test this by analyzing the costs for T-FF1##, T-B4## and T-F1##.
Using the IMG, create a new hierarchy that summarizes orders using the following levels:

Level 1: Controlling area
Level 2: Material group
Level 3: Material number
Level 4: Created by (user id)

Name your new hierarchy AC510-##. In addition to the costs, have the quantities summarized.

Favorites → Tools → Accelerated SAP → Customizing → Edit Project

Choose SAP Reference IMG

Controlling → Product Cost Controlling → Information System → Cost Object Controlling → Settings for Summarized Analysis/Order Selection → Maintain Summarization Hierarchies

Select New Entries

Enter AC510-## and a description.

Select Summarize input qty

Select Data Scope(object types)

Select Summarization for Prod. Orders, QM Orders, Prod. Cost Collectors

Select Data Scope(Totals Records Tables)

Variances/results analyses, Activity quantities, Primary costs and Secondary costs should be active.

Select Hierarchy levels

Select New Entries

Enter MATKL

Enter MATNR

Enter ERNAM

Save.
1-2-2 Perform data collection for your hierarchy. Restrict the From and To period to the previous month and the current month of the current fiscal year. Perform the summarization online, and attach an existing exception rule for analyzing the target costs to the actual costs.

Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Order → Information System → Tools → Data Collection → For Summarization Hierarchy

Enter hierarchy AC510-##

Enter the previous period and the current period

Deselect Background processing

To assign the exception rule: Extras → Exception → Define rule

Select an exception rule from the list

Execute

1-2-3 Display the summarized data for hierarchy AC510-## using the plan to actual comparison hierarchy report. The plan to actual costs for the summarized hierarchy are displayed. From the report output, navigate to the material group metal processing, then material T-B4##. Next, navigate to the detailed reports for the product cost collectors by selecting the user ID. Repeat this procedure for chemicals and T-FF1##.

Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Order → Information System → Reports for Product Cost by Order → Summarized Analysis → With Defined Summarization Hierarchy

Enter hierarchy AC510-##

Execute

The plan to actual costs for the summarization hierarchy are displayed.

Select Hierarchy

Expand Metal Processing

Expand T-B4##

Select your user id

Goto → Cost Element Report
1-3 The order selection report will demonstrate the ability of the system to highlight orders that meet specific exceptions, such as a 20% variance between planned and actual cost. In addition, the order list can be limited to only display orders within a certain time period, and that meet a specific condition or status, such as variances calculated.

1-3-1 Using the order selection report, select the production orders for material T-FF100 to T-FF330, plant 1100, using order type PI01. Set the threshold values to restrict the time period for selection from 01/1998 to the current period. Lastly, define the exception to highlight the orders that have a cost variance against percent above 20%, and use the yellow for those whose variance is above 10%. Do not restrict the selection by status.

Accounting → Controlling → Product Cost Controlling → Cost Object Controlling → Product Cost by Order → Information System → Reports for Product Cost by Order → Object List → Order Selection

Enter Plant 1100
Enter Material T-FF100 to T-FF330
Enter Order type PI01
From period: 01, 1998
To period: Current Period
Accept the remaining defaults
To highlight the exception: select Define exception
Accept the default rule basis
Enter 20 in the threshold red field, 10 in the threshold yellow field
Confirm
Execute

1-3-2 From the report output, display the different views of the report.

Choose Select Layout
Select the different layouts for the report

1-3-3 Using the order comparison report, select any two orders from the list and branch to the comparison report. Accept the default report parameters for the actual order report. After reviewing the comparison report, return to the order list.

Holding down the control key, choose any two orders

Goto → Detailed analysis → Compare orders
Accept the default report parameters
1-3-4 Return to the *Order Selection Results List*. Select one of the orders, and call up the planned/actual comparison report. Change the from Fiscal year to 1998, for the report parameters. Select a cost element that has actual costs and display the line items.

*From the order comparison report, select the green arrow back.*

Choose an order

_Goto → Detailed analysis → Online_

Choose _Plan/Actual comparison_

Accept the default parameters

The report is displayed

To display a line item report, select a cost element with actual costs,

_Goto → Line items_

1-3-5 The output for the line item report can be altered by using ALV. Using the ALV settings, remove the name of the offsetting account from the list and add the posting date. It is not necessary to save this layout.

Choose _Change layout_

Select _Name of offsetting account_

Select _Hide selected fields_

Select _Posting date_

Select _Show selected fields_

Choose _Copy_
Appendix: Contents

- External Procurement
- External Processing
- Subcontracting Without Controlling
- Subcontracting with Controlling for Manufacturing Orders
At the conclusion of this unit, you will be familiar with the process and cost controlling of:

- External procurement
- External processing
- Subcontracting
Introduction: Business Scenario

- The manufacturing order contains components that are procured from an external supplier.
- Because of capacity problems in the paint shop, it was decided to have a subcontractor perform the painting operation. The subcontractor will be supplied with the required paint.
Road Map: Outsourcing Parts and Services

- Outsourcing Parts and Services
  - External Procurement
  - External Processing
  - Subcontracting Without Controlling
  - Subcontracting with Controlling for Manufacturing Orders
- You are procuring the finished product from an external vendor. You can provide the vendor with the required parts.

- When you post the goods receipt for the externally procured products, the goods issue for the provided part is posted simultaneously.

- The invoice from the vendor is posted with reference to the delivery. A higher or lower consumption of the provided part can be taken into account at the time of the goods receipt and invoice receipt.
- If the manufacturing order contains purchased parts, the system automatically generates a purchase requisition when the order is released.

- If you have activated commitments management for the order type of the manufacturing order, the purchase requisition automatically posts a commitment for the manufacturing order. When the goods receipt is posted, the commitment is canceled and the costs in the purchase order are assigned to the order.

- Any differences that arise when the invoice is posted are taken into account in the manufacturing order.
The slide shows the posting of the goods receipt. The manufacturing order is debited with the costs of the externally procured material. The costs are determined on the basis of the valuation variant for the preliminary cost estimate of the order.
Any price differences that arise when the invoice is posted are taken into account in the manufacturing order.
Road Map: Outsourcing Parts and Services

- Outsourcing Parts and Services
  - External Procurement
  - **External Processing**
  - Subcontracting Without Controlling
  - Subcontracting with Controlling for Manufacturing Orders
For external processing, you define the external service in the purchase order. You can send the materials intended for external processing to the vendor (provision).

When the goods receipt for external processing is posted, the goods issue for the provided parts is posted at the same time.

The invoice receipt is posted with reference to the goods receipt. Differences can be taken into account at this point (over- or underconsumption of the provided part).
- When you release a manufacturing order with external processing, the system automatically generates a purchase requisition.

- The purchase requisition is of type NB (standard purchase order), which cannot be changed.
The price used in the preliminary cost estimate for external processing is either the price in the operation or the price specified by the quota arrangement of the purchase order.

The control key in the operation determines whether the operation is relevant to costing.

The valuation variant specified by the costing variant determines which price is used to valuate external processing.
Account assignment for the costs of external processing is performed on the manufacturing order.
Price differences between the goods receipt and the invoice receipt also are updated to the manufacturing order.
Outsourcing Parts and Services

- External Procurement
- External Processing
- Subcontracting Without Controlling
- Subcontracting with Controlling for Manufacturing Orders
For subcontracting, you define the external service in the purchase order. You can send the materials intended for subcontracting to the vendor (provision).

When the goods receipt for external processing is posted, the goods issue for the provided parts is posted at the same time.

The invoice receipt is posted with reference to the goods receipt. Differences can be taken into account at this point (over- or underconsumption of the provided part).
Posting the goods receipt of the subcontracted material results in the inventory for the provided part being charged off.
To post price differences with subcontracting, you must assign the accounts for account grouping code VBO in the context of account determination.
The check box *Overhead on subcontracted materials* enables you to include overhead in the costs of subcontracting.
Road Map: Outsourcing Parts and Services

- Outsourcing Parts and Services
  - External Procurement
  - External Processing
  - Subcontracting Without Controlling
  - Subcontracting with Controlling for Manufacturing Orders
For subcontracting, you define the external service in the purchase order. You can send the materials intended for subcontracting to the vendor (provision).

When the goods receipt for external processing is posted, the goods issue for the provided parts is posted at the same time.

The invoice receipt is posted with reference to the goods receipt. Differences can be taken into account at this point (over- or underconsumption of the provided part).
Subcontracting with Manufacturing Orders - Assignment of Part Provided

BOM T-EX

100-804 Yellow paint Sub-contracting

Routing T-EX

Operation 0030: Masking, painting Sub-contracting

Change: Operation for pressure cover dropped.

For subcontracting when parts are provided and Controlling is performed on a manufacturing order, you make the following settings:

- You use the control key to assign the external processing indicator to the operation that will involve subcontracting and provision of parts.
- You assign the BOM item of the provided part to the externally processed operation.
- The subcontracting costs are determined using the external processing data specified in the externally processed operation. You select the Subcontracting indicator so that the parts provided are included in the purchase requisition for subcontracting.

In MRP, or when a manually created production order is released, a purchase requisition is generated for the subcontracted operation.

When the goods receipt for subcontracting is posted, the goods issue for the parts provided is posted as well.

Repostings in Materials Management, such as reposting of unrestricted-use stock as vendor provision parts or goods issues for the components intended for subcontracting, is the responsibility of Logistics.
The planned costs for the manufacturing order can be calculated based on the following prices:

- Price in accordance with purchasing info record
- Price selected in accordance with price control in material master record (if stock material)
- Price in accordance with entry in operation

The actual costs are assigned to the manufacturing order at the time of the goods receipt. These actual costs include the costs of subcontracting and of the parts provided.

Price differences between the goods receipt and the invoice receipt are updated to the manufacturing order.
You establish the parameters for calculation of the subcontracting costs using a strategy sequence for price selection. The basis is either the price in the purchasing info record or the price in the purchase order.

With subcontracting, the quota arrangement indicator determines the rules for selecting the vendor for costing. You select either the vendor with the highest planned quota, the vendor with currently lowest actual quota, or the cheapest vendor.

You can apply overhead to the subcontracting costs.
The subcontracting costs are assigned to the manufacturing order at the time of the goods receipt.
Price differences between the goods receipt and the invoice receipt are updated to the manufacturing order.
You are now able to:

- Explain the process of external procurement
- Explain what external processing is
- Describe the process of subcontracting both with and without Controlling for manufacturing orders
- Explain which settings must be made for external processing and subcontracting