MFG/PRO MASTER CLASS

Best Practice Inventory Management

TRAINING GUIDE

QAD

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MFG/PRO eB
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About This Course

Course Description

The Best Practice Inventory Management Master Class is an intensive, two-day workshop for experienced MFG/PRO user teams. The underlying principle of this class is that many inventory management practices can be significantly improved.

The goal of this Master Class is to give experienced MFG/PRO user teams the knowledge and tools required to achieve best practices in inventory management. It focuses on time-tested inventory management concepts and the discipline required to implement them.

The Best Practice Inventory Management Master Class is designed to help your experienced MFG/PRO user team leverage its MFG/PRO investment by using the QAD solution to its fullest potential.

You will establish inventory management goals, describe your current processes, and learn how to promote the disciplined use of inventory management throughout your organization.

You will learn how to:

- Manage safety stock
- Set up account structures
- Deal with a physical inventory
- Define location parameters for control
- Manage excess and obsolete inventory
- Set up item and inventory status codes
- Implement and manage cycle count programs
- Manage the interface with purchasing and manufacturing
- Use lot control for enhanced accuracy and better management
- Set up and manage:
  - Work center stock locations
  - Scrap and recycle materials
  - Consignment inventory locations

Who Should Attend This Course

Best Practice Inventory Management is ideal for cross-departmental teams concerned with process improvements and getting the most from their investment in MFG/PRO.

Approximate Length of Course

- QAD designed this Master Class to be taught in two days

Prerequisites

The Best Practice Inventory Management workshop requires advanced knowledge of QAD solutions and associated business issues.

About QAD

Best-in-Class Manufacturing

QAD's global manufacturing expertise delivers value through collaborative commerce applications that empower enterprises to integrate diverse business processes and increase market share.

Manufacturers of automotive, consumer, electronics, food and beverage, industrial, and medical products use QAD software at more than 5,100 licensed sites in more than 80 countries and in as many as 26 languages.

QAD has a proven track record of more than 20 years of leadership in collaborative commerce applications.

- Leading innovator in collaborative commerce solutions for the manufacturing marketplace
- Global technical, implementation, learning, and support services
- ISO 9002 certified in 1995
- Public company (Nasdaq: QADI)

Vision

QAD products help to create a competitive advantage in the marketplace for our customers

Values

- Customer-oriented
- Integrity
- Teamwork
- Innovation

- Speed
- Diversity

Value Proposition

The global manufacturing expertise of QAD delivers value through collaborative commerce applications that empower enterprises to integrate diverse business processes and increase market share.

Enterprise

- Manufacturing, Distribution, Financials, Service, Business Intelligence, Demand Management, Supply Chain Optimization, Interoperability, EDI ECommerce

Enterprise Exchanges

- Commerce Relationship Management, QAD eQ Sell-side, QAD eQ Buy-side, QAD eQ Replenishment, QAD Supply Visualization

Marketplace Exchanges

- Solutions for trading exchanges and e-markets

Facilities

Telephone/Fax

Class Hours

Emergency

Messages

Breaks

Restrooms

Parking

Smoking

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CHAPTER 1

Introduction

Oliver Wight Class A User Status

The Best Practice Inventory Management Master class is designed to help experienced MFG/PRO user teams become Oliver Wight Class A users.

Oliver Wight ABCD Checklist

The Class A status is defined by the Oliver Wight ABCD checklist for operational excellence – an industry standard for manufacturing companies to measure current levels of performance and benchmark them against the best practices in the industry.

The ABCD checklist is an important tool in evaluating a company's effectiveness in using technology. (Class A is the highest classification, and Class D is the lowest.)

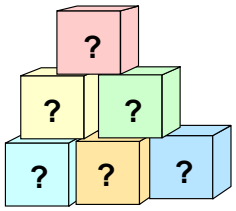
Becoming a Class A user requires training and discipline and a broad base of knowledgeable and trained employees. This requires an enormous amount of discipline and comprehensive training in order to be aware of the opportunities and technologies that can make a company as efficient as possible.

Even a Class A status, achieved when the highest return on investment (ROI) potential is realized, can do more. Class A users:

1. Know how a system's potential can be maximized.
2. Understand basic American Production and Inventory Control Society (APICS) concepts, as well as their own business processes.
3. Have a vested interest in getting more ROI from their ERP implementations at very low, incremental cost to the business.

Inventory Management

- The Weak Link in:
  - Best of Breed
  - Best Practice
  - Best in Class
  - World Class



If you are not 98% confident of what's in the warehouse, the rest of your world-class "stuff" is running on empty.

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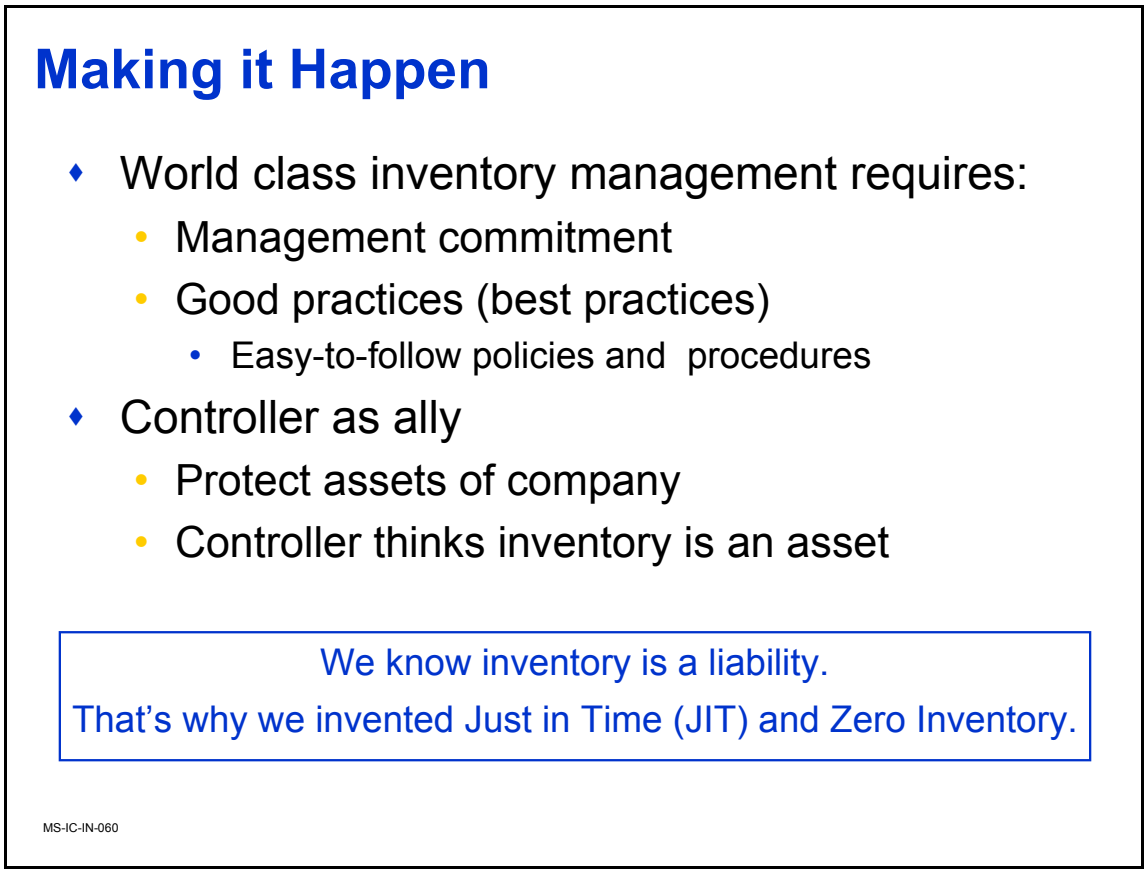
Inventory Management: The Weak Link

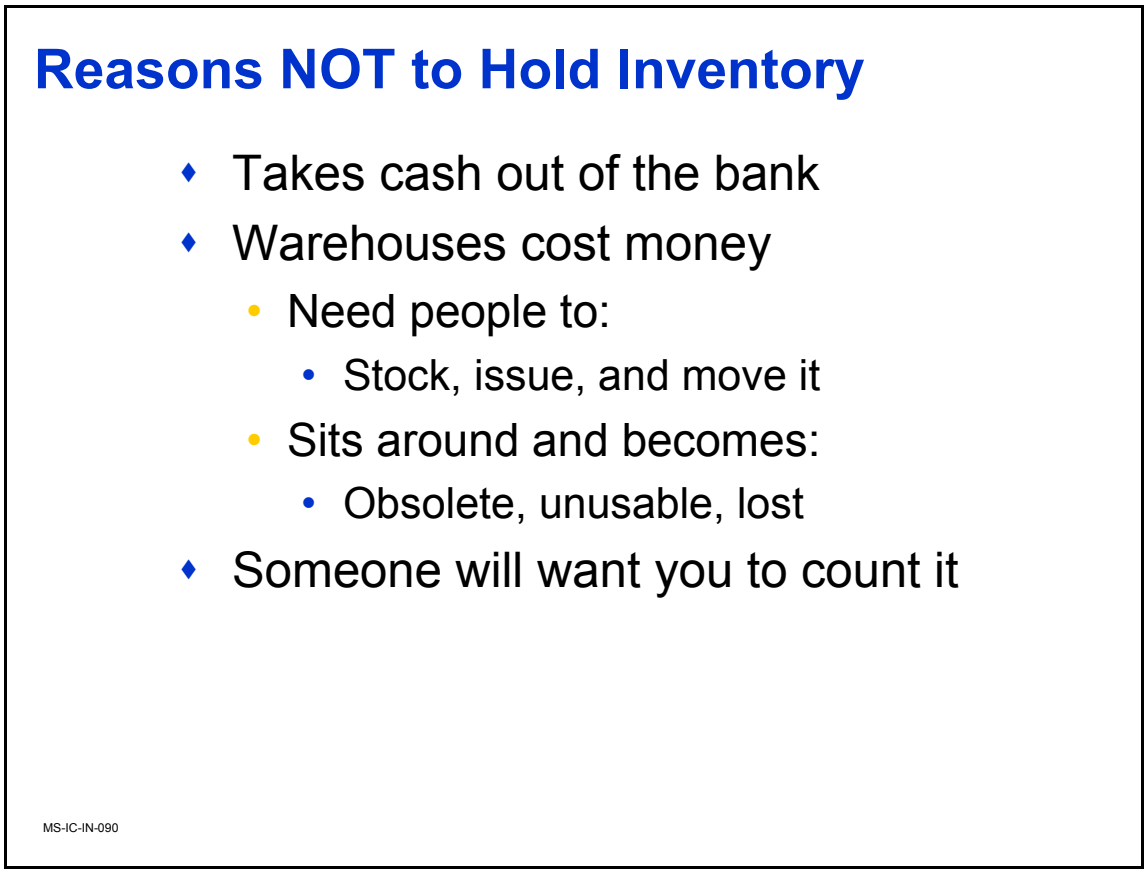
Know What's in the Warehouse



Making it Happen

Course Goals

Reasons to Hold Inventory



Reasons Not to Hold Inventory

The Point About Holding Inventory

- Know why
  - List reasons in an inventory policy (customer service level, seasonal requirements, etc.)
- Be sure reasons support business need
  - Best way to support that need
- Quantify inventory investment
  - 98% service level requires $450,000 inventory (APICS textbook will help with the math)
- Sum all inventory investments

If inventory does not support customer service, why hold it?

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Know Why You Carry Inventory

So, you're going to hold inventory?

- Make absolutely sure you know at all times:
  - What and how much you have on hand
  - Where it is (all the places it is)
  - Value of what you have on hand
    - By type and status
  - Status of everything you have on hand
    - Why were you holding:
      - Obsolete items?
      - Expired items?
      - Rejected items?

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Be Sure You Know What You Have

In the Bad Old Days

- Period inventory techniques – month-end counting
  - Valuing it at cost
  - Adding purchases and subtracting sales for current month
  - Estimated new month-end balance
  - Difference from prior month was cost of goods sold
  - Counted again
    - Booked the difference to estimate as write up or down (shrink)
  - Good Points
    - Worried about it once a month
  - Bad Points
    - Doesn't work very well
    - Focuses on cost, not whether you have the right stuff

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Period Inventory Techniques

In the Good Days

- Perpetual inventory techniques
  - Booking inventory receipt for each thing we buy as we put it away
  - Book both count of items and their cost
    - For most of us the system is remembering the cost
  - Book every issue as we take things out of inventory
    - Yields a system, usually computerized, that knows both the count and value of everything on hand at all times
  - Book adjustments as we recognize the need for them
- Way we keep checking account register

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Perpetual Inventory Techniques

Keys to Success (1 of 3)

- Physical control
  - Right place and conditions for everything stored
    - Safe for materials and humans
    - Secure – no un-authorized access
    - Clean orderly and logical – need to be able to find things
    - Store material in the:
      - Hallway, parking lot, custodians closet, your desk drawer, or lunchroom refrigerator, that's fine BUT
      - Must have defined locations and transactions processed
  - Segregation of direct materials and other things
    - Tools, jigs, fixtures, documents, processing supplies
    - Are either assets or overhead expense items
      - Either way, they do not belong in direct material inventory

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Keys to Success

Physical Control

Keys to Success (2 of 3)

- Physical control
  - Only authorized folks touch inventory
    - Everyone knows who they are by area
    - Put things away
    - Move things around
    - Take things out
    - Book adjustments or cycle counts
  - Segregate non-conforming materials
    - Reject, recycle, scrap, obsolete, quarantine, evaluation, etc.
    - Disposition it quickly

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Segregate Non-conforming Materials

Keys to Success (3 of 3)

- Timely transactions
  - Process electronic and physical transaction at same time
    - Write check in the register when you write the check
- Get the count right
  - Know the quantity of the transaction
    - Write the correct amount of the check in both places
  - Be sure you have correct tools to get count right
    - Scales, counters, meters – whatever you need
- Check on-hand balances frequently
  - Cycle count on a regular and frequent basis

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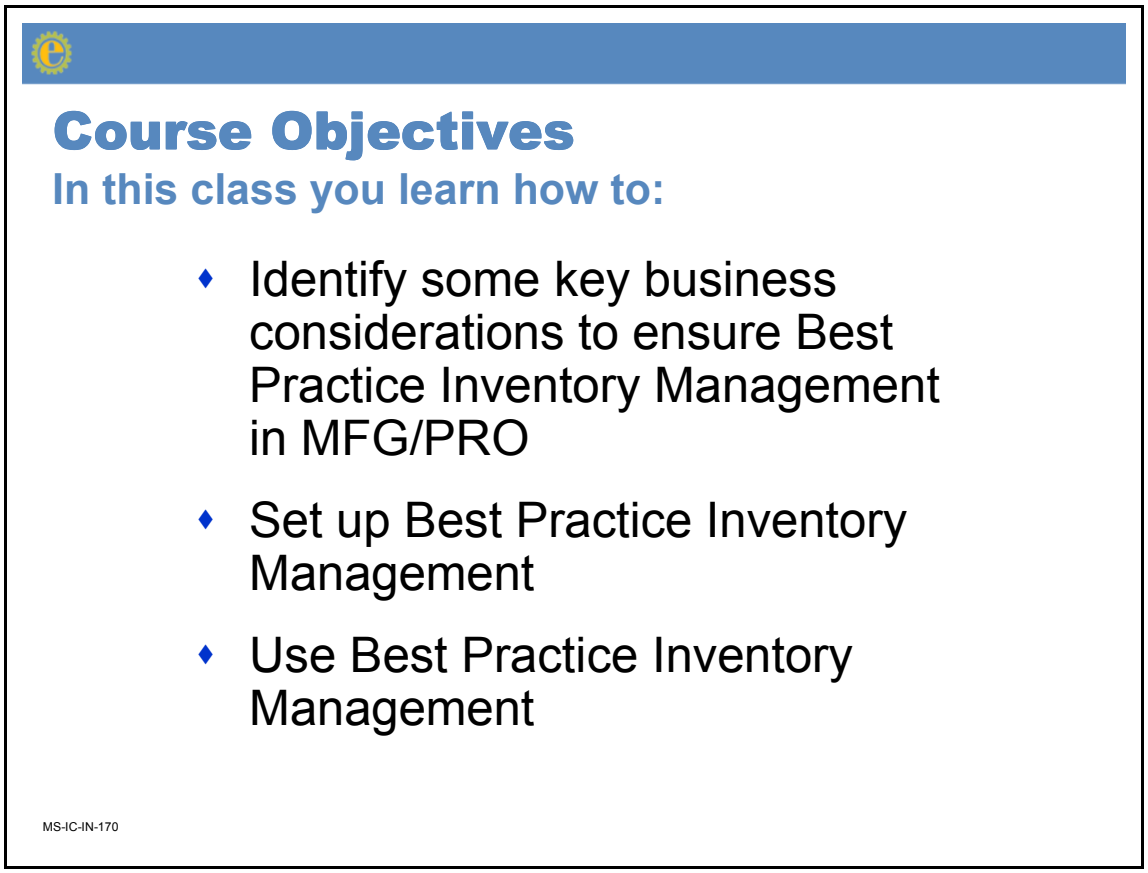
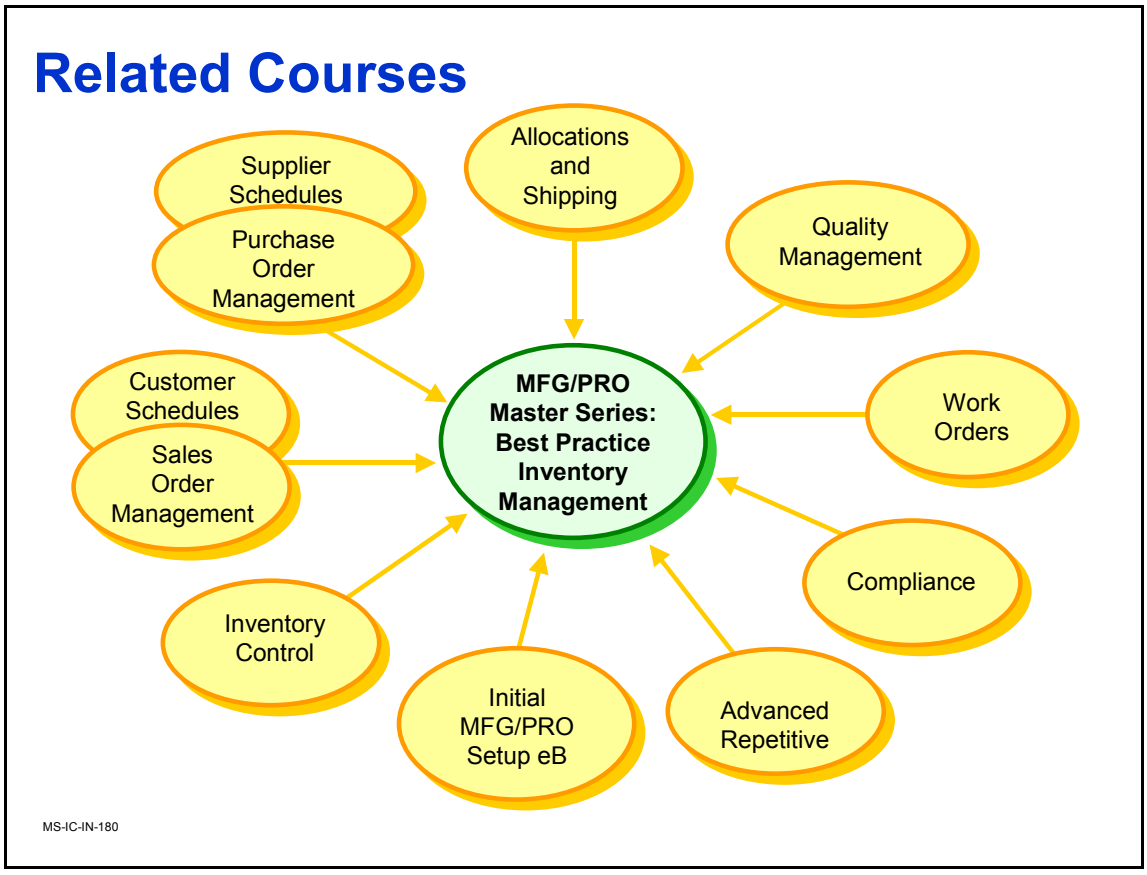
Timely Transactions

Get the Count Right

Check On-hand Balances



Course Objectives



Related Courses

Course Overview

- ✓ Introduction to Master Series: Best Practice Inventory Management
- ♦ Business Considerations
- ♦ Set up Best Practice Inventory Management
- ♦ Use Best Practice Inventory Management

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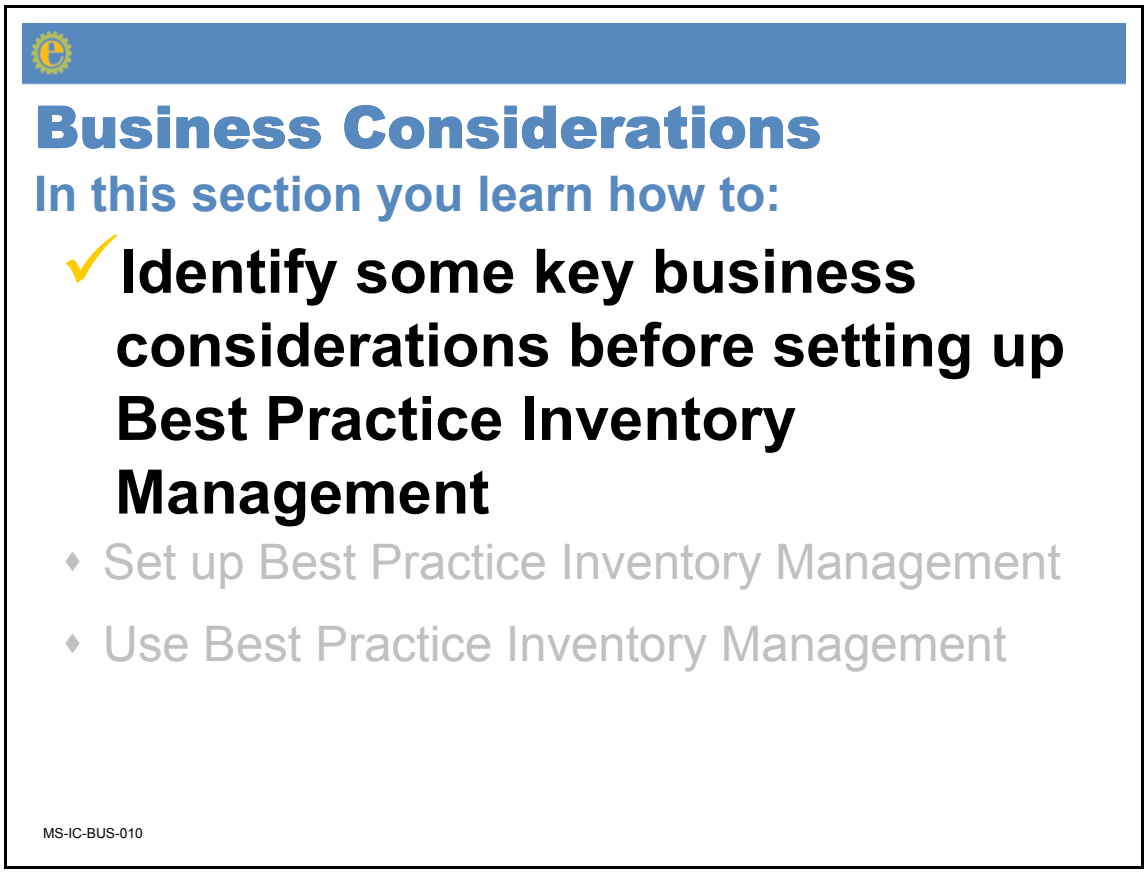
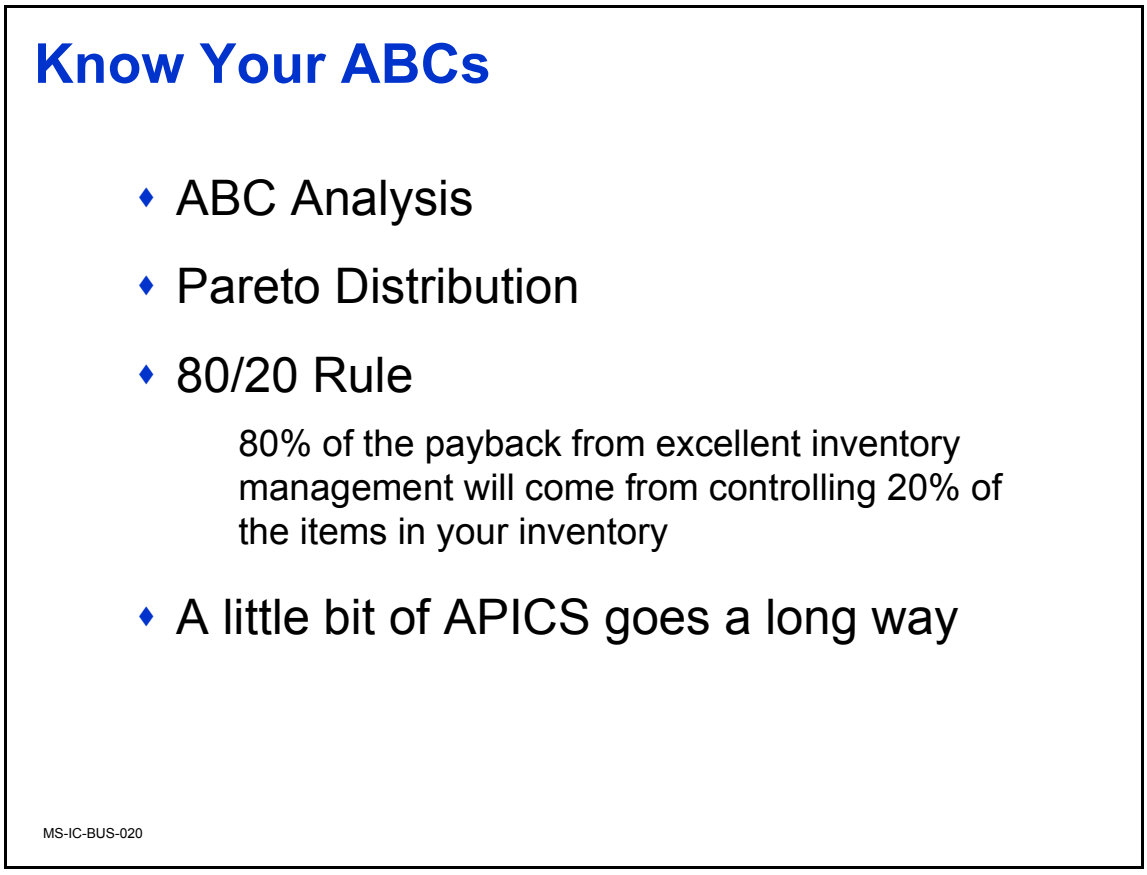
CHAPTER 2

Business Considerations

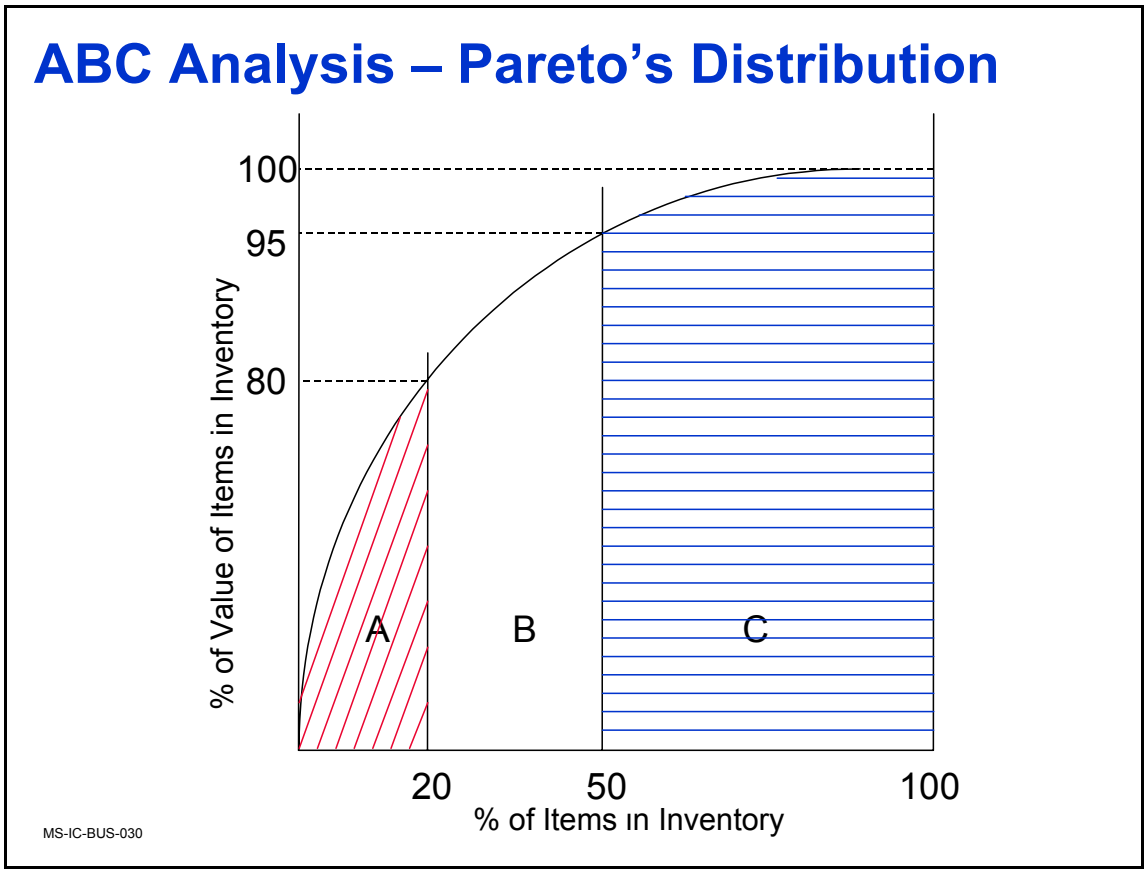


Business Considerations



Know Your ABCs

There are several business considerations to look at before setting up Best Practice Inventory Management in MFG/PRO. This section does not discuss all potential considerations, but presents several to generate thought and discussion.



ABC Analysis – Pareto's Distribution

Know Your ROI

- Reducing inventory improves Return on Investment (ROI)
- Most ERP users can improve ROI with no further capital investment
- Training can make the difference
- Understand how ROI works
  - Simple models work best

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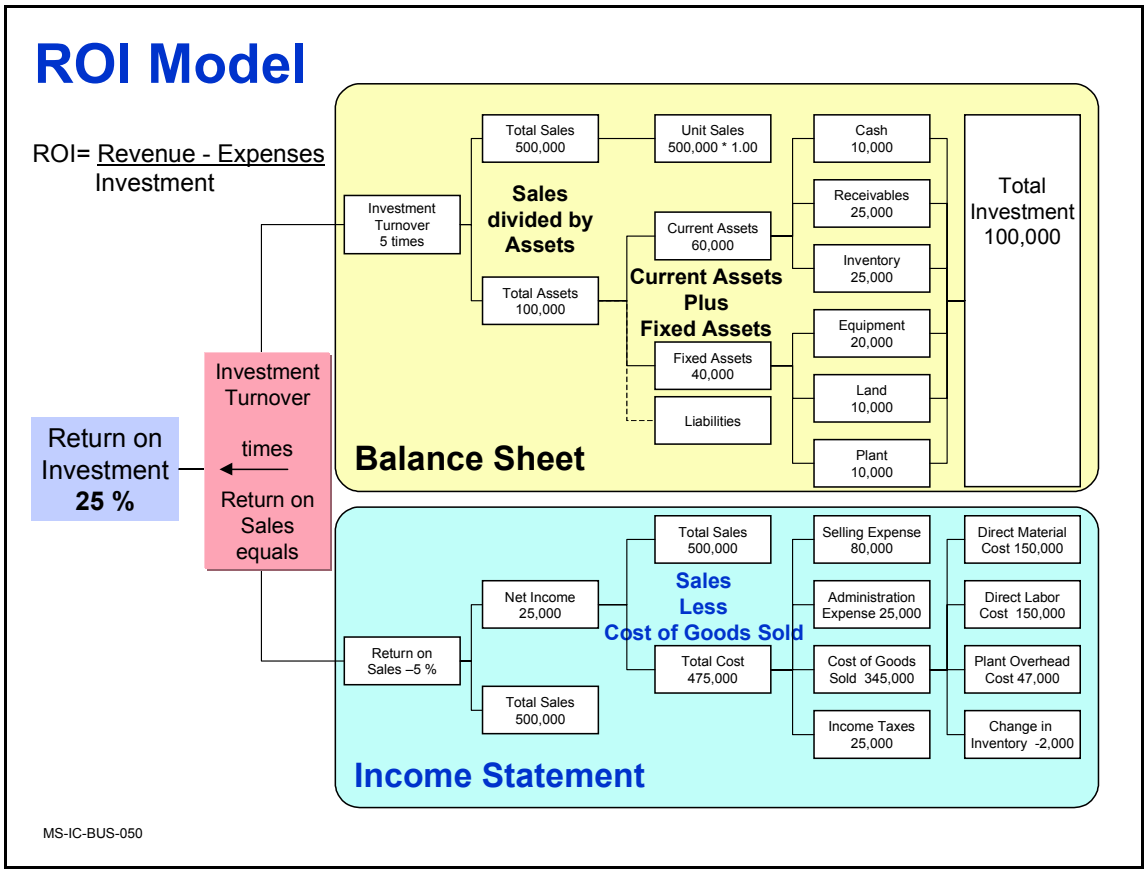
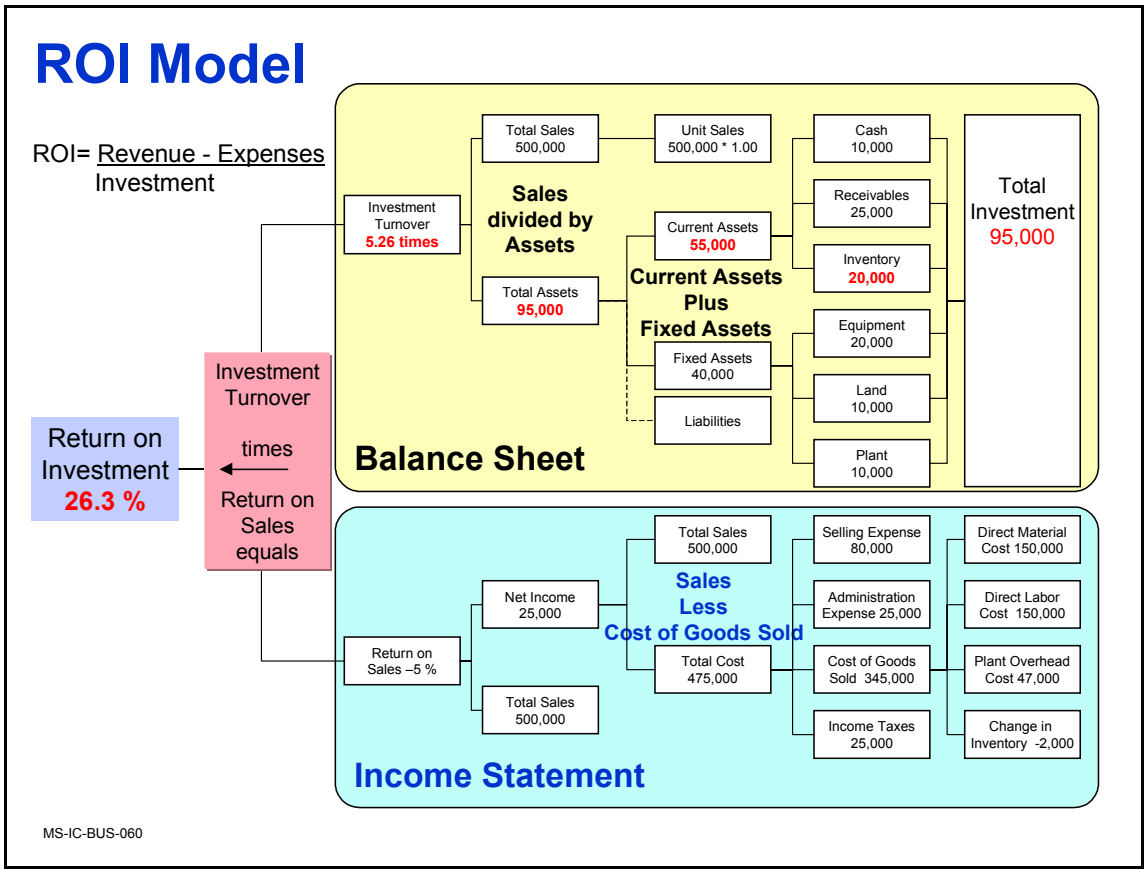
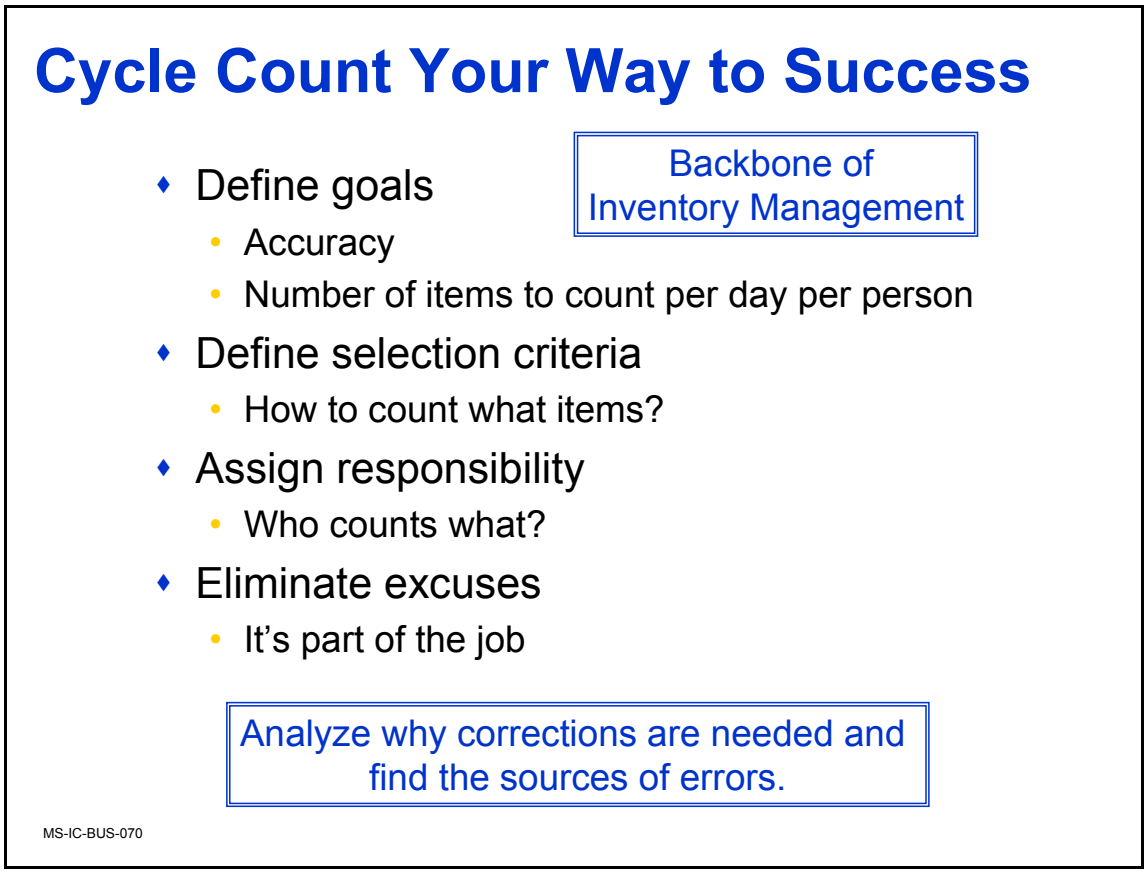
Know Your Return on Investment (ROI)



25% ROI Model



26.3% ROI Model



Backbone of Inventory Management

Course Overview

- ✓ Introduction to Master Series: Best Practice Inventory Management
- ✓ Business Considerations
- ♦ Set up Best Practice Inventory Management
- ♦ Use Best Practice Inventory Management

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CHAPTER 3

Set Up Best Practice Inventory Management

Set up Best Practice Inventory Management

In this section you learn how to:

- ✓ Identify some key business considerations before setting up Best Practice Inventory Management
- ✓ **Set up Best Practice Inventory Management in MFG/PRO**
  - ♦ Use Best Practice Inventory Management

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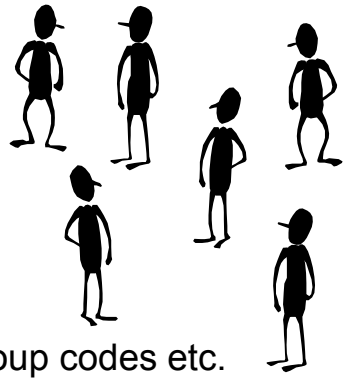
MFG/PRO – Set Up for Success

Cross-functional Teams

Team Decisions for System Set Up

The big picture includes questions for the whole business



- How many?
  - Databases, sites, locations
- What?
  - Account structure
  - Product lines
  - Status codes, type codes, group codes etc.
- Define customer service levels
  - Ship from stock
  - Make to order with lead time of ? days

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Team Decisions

How many?

What?

Ongoing Team Activity

- Continues long after implementation
- Guides policy and procedure creation
  - Manages business re-engineering
  - Tests new process concepts
  - Analyzes effect on business
- Authorizes new codes
  - Procedures
  - Policy changes
  - Expansion into new business areas

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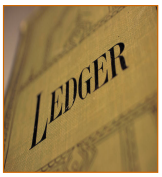
Ongoing Team Activity

After Implementation

GL Chart of Accounts

- Set up inventory accounts
  - Normal inventory accounts are asset type
- You may need other inventory accounts
  - Expense
  - Memo



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General Ledger (GL) Chart of Accounts

Types of Inventory Accounts

Setup Activities

Log In

Instructions: After initial log-in, use your initials in the User I.D. field. No password is required. You may wish to set up your demo database for your preferences.

1 You may maintain the menu style of your preference in User Interface Profile 36.20.4.

2 If you are running the Demo CD version of MFG/PRO eB, “un-check” the radio button “Win Help?” in User Interface Profile 36.20.4. This will improve access to the online help files.

3 At the Main Menu, under options, you may check Menu Substitutions for traditional inquiries or uncheck it for browses.

4 If a printer is set up in the classroom, you may wish to print hard copy (not needed for the course.)

   a You will need to modify the printer set-up in Printer Setup Maintenance 36.13.2. In the Output To field, find the device "Printer".

   b The "Device Pathname" will be specified by your instructor.

   c On the first line of the field 80 Col Start Ctrl, remove the forward slash from the last position on the line.

   d Add a forward slash to the first position of the second line.

5 For the classroom, you may set Printer Default Maintenance 36.13.4 to Window.

6 If you are printing reports, you should modify the special address code ~reports using Company Address Maintenance 2.12 to put your name in the Name field. This will print your name on your reports.

7 Check the items under the User Menu, the left-most menu in your menu bar at the top of the screen. Other items can be added to this list using User Function Maintenance 36.4.11.

Set up General Ledger

1 Use Account Code Maintenance 25.3.13 to set up accounts for indirect inventory.

2 Set-up account 1510, type E (Expensed Inventory), format position 72000.

3 Set-up account 1520, type M (Consignment Inventory), format position 72000.

4 Verify accounts:

   a 1500 Inventory

   b 1530 Goods in Transit

   c 1560 Floor Stock

   d 1600 Work in Process

5 Make entity 1000 NOT the primary entity. Using Entity Code Maintenance 25.3.1, set Primary Entity = No.

6 Create Entity 10 (for Presentation Pens) as the Primary Entity.

7 Set default entity to 10 in the System Account Control File 36.1.

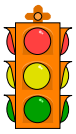
8 Using Cost Center Code Maintenance 25.3.20, set up Cost Center Code 0222 for Pen and Pencil Sets, valid for all account code.

9 Verify GL Calendar for current year using GL Calendar Inquiry 25.3.5. If there is no calendar, add one using GL Calendar Maintenance 25.3.4.

10 If you are a new user, or otherwise uncertain, we recommend checking your maintenance work with the appropriate inquiry.

Status Codes (1 of 3)

- Inventory status codes define whether items are:
  - Available to allocate or issue
  - Nettable (MRP may use to cover gross requirements)
  - Overissue
    - Allows negative on-hand balances
    - Always wrong (there are no negative items)
    - Usually results from a timing problem (issue before receipt)
    - Preventing overissue forces you to correct a mistake before you proceed



Never allow overissue

***Even worse in an average cost environment or regulated industry**

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Inventory Status Codes

Available to Allocate or Issue

Nettable

Overissue

Status Codes (2 of 3)

- Inventory Status Codes
  - May restrict specific inventory transactions
  - You need at least three:
    - **Good** = items you know are OK to use
    - **Bad** = items you know are not suitable to use
    - **Ugly** = items you know need to be evaluated

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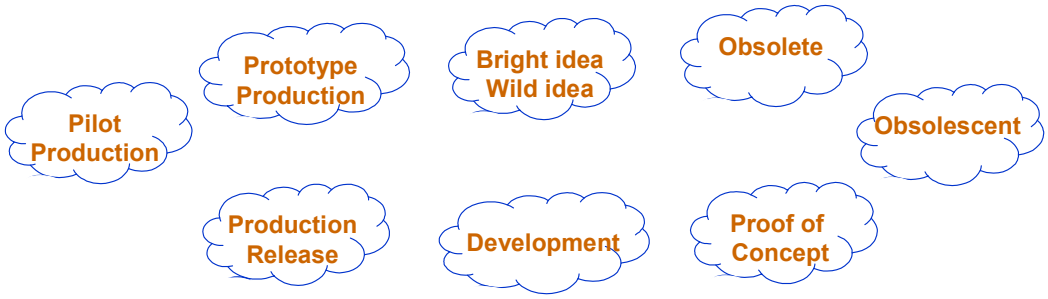
The Good, the Bad, and the Ugly

Status Codes (3 of 3)

- Item Status Codes
  - Use item status codes to manage product life cycle
    - Pre-production, released production, obsolescent, obsolete
    - May also restrict transactions (very handy)
  - How many stages does a product go through in your business?



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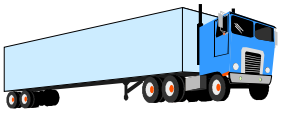
Item Status Codes

Movement Codes

- Required for Global Shipping
  - Allows specific definition of transactions
  - ISS-SO sales order shipment can be defined with movement codes for:
    - Domestic, international, no charge replacement
  - Inventory movement codes may be associated with security
  - Links to shipping group
    - Defines relationships between:

      Source and destination locations

      Carriers and inventory movement codes



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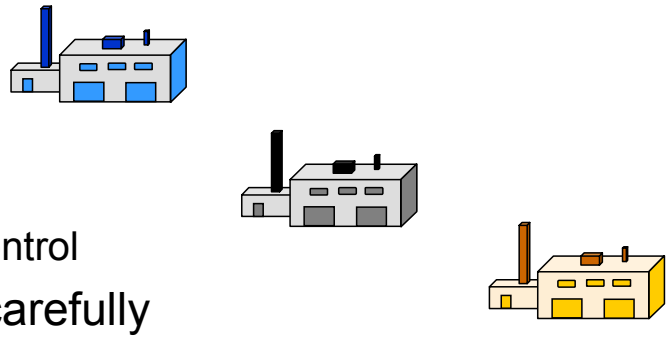
Movement Codes

Sites (1 of 2)

- MFG/PRO manages inventory by site
  - MRP/DRP
  - CRP
  - EMT
  - EOP
  - Cost
  - Inventory Control



- Define sites carefully
  - Not uncommon to have 3 sites in one physical location
    - Manufacturing, sales of finished goods, and service parts
  - Sites may have automatic locations or not (not recommended)

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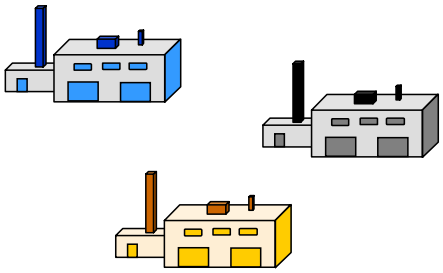
Sites

Define Sites Carefully

Sites (2 of 2)

- Other uses
  - Distribution centers
  - Remote warehouses
  - Repair center
  - Field service office
  - Internal maintenance (MRO)



- Each site needs address code = site code
  - Allows PO to find address from line item site code
  - Required for Global Tax Management
    - Set up address codes in 2.12
    - Set up site codes in 1.1.13

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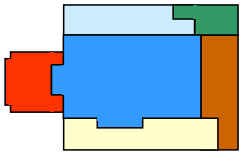
Other Uses

Locations (1 of 4)

- Set up locations
  - You may wish to set up status codes first
- Define every place you keep direct material
  - Use a floor plan
    - Draw lines around every stock location
    - Label every location with a code humans will understand
      - Name or number?
        - If you allocate by location, do not use names
      - If inventory is stored there, Include the:
        - Hallway
        - Janitor's closet
        - Lunchroom refrigerator
        - Supervisor's bottom desk drawer
        - Maintenance tool shed
        - Parking lot



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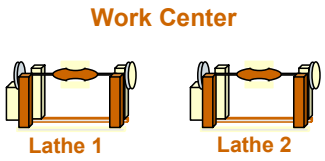
Locations

Set Up Locations

Locations (2 of 4)

- Define inventory locations for work centers
  - Required for advanced repetitive picklist
    - Useful for many environments
      - Tracking floor stock, scrap, rework, recycle, etc.
- Inventory location code = work center code
  - Work Center = 2130
  - Inventory Location = 2130
    - Helpful if work center codes are in a number different range than inventory location codes



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Work Centers

Locations (3 of 4)

- Set up location attributes
  - Default status code
  - May be associated with project codes in eB locations
  - Permanent or not
    - Non permanent locations with no balance may be removed from reports and inquiries
  - Location type (freezer, silo, tank, etc.)
    - System validates against item location type
  - Single item
    - Yes prevents co-mingling items
  - Single lot/reference
    - Prevents co-mingling lots or batches

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Location Attributes

Locations (4 of 4)

- Account code structure for inventory items
  - Normally defined by product line code for items
    - Different product lines may have value of items booked to different inventory accounts
  - Inventory accounts may be defined by:
    - Product line, site, location
    - Use 1.2.13 to assign account codes by site and location
  - GL accounts for inventory are generally:
    - Asset type accounts (25.3.13)
  - May be
    - Expense type (MRO parts inventory)
    - Memo type (consignment inventory)

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Accounts Code Structure for Inventory

GL Accounts for Inventory

Setup Activities

Inventory Status Codes

1 Use Inventory Status Code Maintenance 1.1.1 to set up inventory status codes.

a Good

Available = Yes

Nettable = Yes

Overissue = No

b No Good

Available = No

Nettable = No

Overissue = No

c Maybe

Available = No

Nettable = Yes

Overissue = No

What does this mean?

2 Set up a code to be used for safety stock.

Safe Stk, Available = No

Nettable = No

Overissue = No

3 Check Inventory Movement Codes using 1.1.10.

a Review how the code is used in shipping groups (Shipping Group Maintenance 2.18.1)

b From shipping group 10000, press Go twice, then press Esc twice to see details.

4 Use Item Status Code Maintenance 1.1.5 to set up item status codes.

a Review codes AC, PP, and XX.

b Note what transactions are restricted.

c Add code OBS for Obsolescent.

d Restrict transactions ADD-FC, ADD-PO, ADD-WO, ISS-WO.

What do these restrictions imply?

5 Use Site Maintenance 1.1.13 to set up sites.

- **a** Set up site code 10 as Presentation Pens, entity 10, Default status = Good, Auto Loc. = No
- **b** Set up site code 12 as PP Service Center, entity 10, Default status = Good, Auto Loc. = No
- **c** Set up site code 15 as PP Distribution Center, entity 10, Default status = Good, Auto Loc. = No.
- **d** Set the default site code in the Inventory Control File 3.24 to site 10.

6 Use Company Address Maintenance 2.12 to set up company address codes.

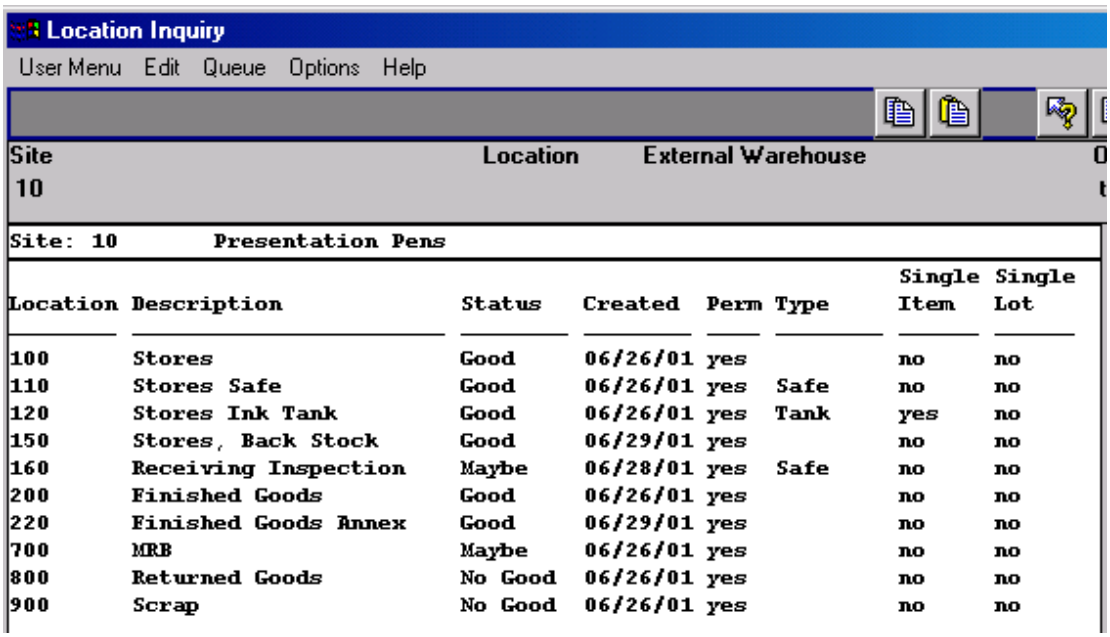
- **a** Set up address codes for each site equal to the site code:

  Address code 10 = site 10 Presentation Pens
  Address code 12 = site code 12
  Address code 15 = site code 15

- **b** For this activity the actual street address is immaterial, but could be different for each site.

7 Use Location Maintenance 1.1.18 to set up locations.

a For site 10 set up the following locations:



Site: 10 Presentation Pens

Location	Description	Status	Created	Perm	Type	Single Item	Single Lot
100	Stores	Good	06/26/01	yes		no	no
110	Stores Safe	Good	06/26/01	yes	Safe	no	no
120	Stores Ink Tank	Good	06/26/01	yes	Tank	yes	no
150	Stores, Back Stock	Good	06/29/01	yes		no	no
160	Receiving Inspection	Maybe	06/28/01	yes	Safe	no	no
200	Finished Goods	Good	06/26/01	yes		no	no
220	Finished Goods Annex	Good	06/29/01	yes		no	no
700	MRB	Maybe	06/26/01	yes		no	no
800	Returned Goods	No Good	06/26/01	yes		no	no
900	Scrap	No Good	06/26/01	yes		no	no

b For Site 12 and 15 set up the following locations:

Site: 15 PP Distribution Center

Location	Description	Status	Created	Perm	Type	Single Item	Single Lot
300	Receiving	Maybe	06/26/01	yes		no	no
400	General	Good	06/26/01	yes		no	no

Product Line Codes

- Product lines link items to account structures
  - Required for all items
    - If it's in the database, it will have a product line code
  - Allow great flexibility in accounting
  - Use product lines for:
    - Different products
    - Same product in different markets
      - Item will require different item numbers
    - MRO items
    - Service and repair items
    - Service contracts
    - Consignment inventory items

MS-IC-SU-180

Product Line Codes

Consider Compliance

- Compliance module offers several features
  - Defined levels of lot control
  - Lot group codes for formatting auto lot numbers
  - Allows:
    - Maintenance of work order item attributes
    - Multi-lot update of work order item attributes
  - Manages work order batch numbers
    - Batch processes run for more than one work order
      - Heat treating, sterilization, painting

MS-IC-SU-190

Compliance

Setup Activities

Product Line Codes

1 Use Product Line Maintenance 1.2.1 to set-up product line codes.

   a Verify product line 1000, Pencil Products.

   b Accept account defaults.

   c Set up product line 1010, Gold Pen & Pencil Sets.

   d Assign cost center code 0222 to all sales accounts and cost of sales (COGS) accounts.

   e Set up product line 1100, purchased gold parts.

   f Accept account defaults.

Note If needed, this inventory account could have a different account structure by modifying the account code structure in Inventory Account Maintenance 1.2.13.

   g Set up product line MRO, for MRO items.

   h Change the account number for the inventory account to 1510.

2 Use the Compliance Control File 1.22.24 to enable the Compliance Module.

   a Set Compliance Active to Yes.

   b Set lot control level to 1.

   c Accept other values at default.

3 Use Lot Group Maintenance 1.22.13 to set up lot group maintenance.

This will allow automatic work order lot numbers with a unique format.

In our case the format will be: PP10-12345-01. This represents Presentation Pens site 10, five numerics, and year 01 (or current year).

You need to manually change the year indicator each year.

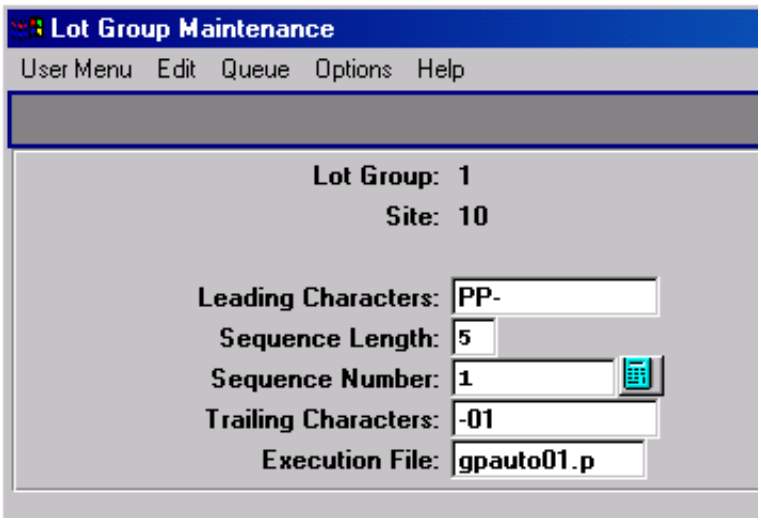
a Set up lot group 1 at site 10

b Leading characters = PP10-

c Sequence length = 5

d Sequence number = 1

e Trailing characters = -01 (or current year)



Items (1 of 2)

- Start with items you will inventory
  - Must be uniquely defined
    - Form, fit, and function
    - If different, it's a different item number
- Unit of measure is critical – get it right the first time
  - Item unit of measure should be unit of measure you choose to use for inventory and issues
    - Example: Glue that comes in 3 and 5 ounce tubes
      - Item numbers for each tube, both stocked in ounces
      - Purchase unit of measure conversion changes tubes to ounces
    - Generalized codes validate unit of measure codes

MS-IC-SU-210

Items

Unique Definitions

Unit of Measure is Critical

Items (2 of 2)

- Everything gets item codes (part numbers)
  - If it doesn't have an item code, it doesn't exist
  - Organize using item type and group codes
  - Manage product life cycle with item status code
    - Pre-production, released, obsolescent, obsolete
    - May also restrict transactions (very handy)
- Consider lot/serial control
    - Compliance Module
    - Define location type code
      - Freezer, silo, tank, for example
    - Specify shelf life
    - Specify default status code for receipts

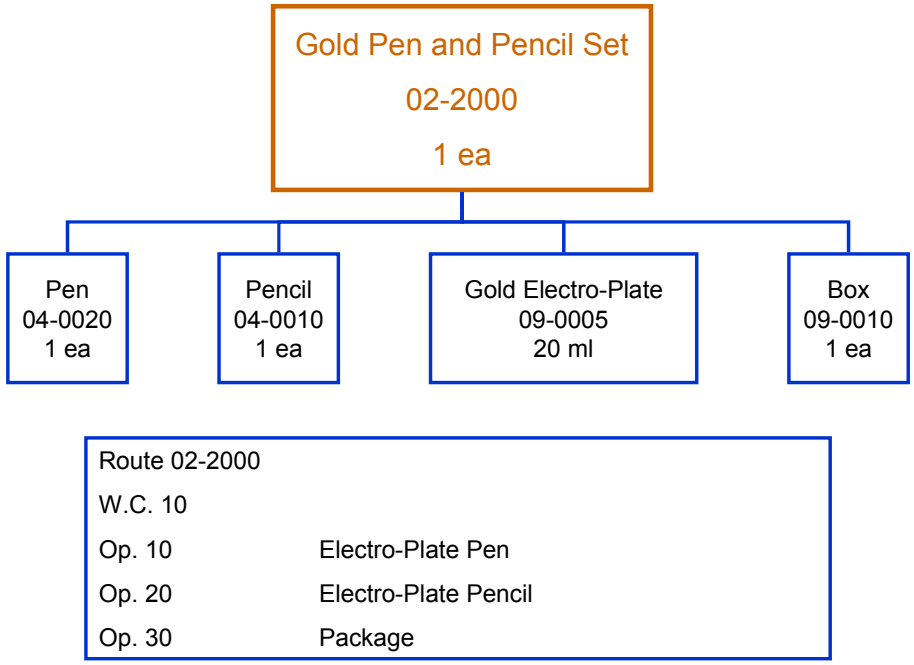
MS-IC-SU-220

Item Codes

Lot or Serial Control

Setup Activities

Activity: Product Structure



Instructions: Use the illustration above as reference information for the following activities.

Items

1 Use Item Master Maintenance 1.4.1 to create the following items:

Item No:	02-2000	04-0010
UM:	EA	EA
Description:	Gold Pen & Pencil Set	Pencil
Prod Line:	1010	1100
Promo Group:	pg1	pg1
Item Type:	FINGOOD	COMP
Status:	AC	AC
Group:	DISCRETE	PUR
Lot/Serial Control:	L	<blank>
Site:	10	10
Location:	200	100
Location Type:	<blank>	<blank>
Auto Lot Numbers:	YES	NO
Lot Group:	1	<blank>
Cyc Cnt Int:	30	30
Shelf Life:	<blank>	<blank>
PO Rcpt Status:	<blank>	GOOD
WO Rcpt Status:	GOOD	<blank>
Active:	Yes	Yes

2 In Item Master Maintenance 1.4.1 use the Ctrl F key while on the Unit of Measure field (UM) to find its database name: pt_um.

3 Use Generalized Codes Maintenance 36.2.13 to validate units of measure.

a For the field name pt_um set up the following values:

EA: Use the comments field for the description, Each.

GM: Gram

ML: Milliliter

L: Liter

CS: Case

4 Use Window Help Maintenance 36.4.21 to call a pop-up Window.

a For field pt_um set the Procedure to Execute to gplu072.p.

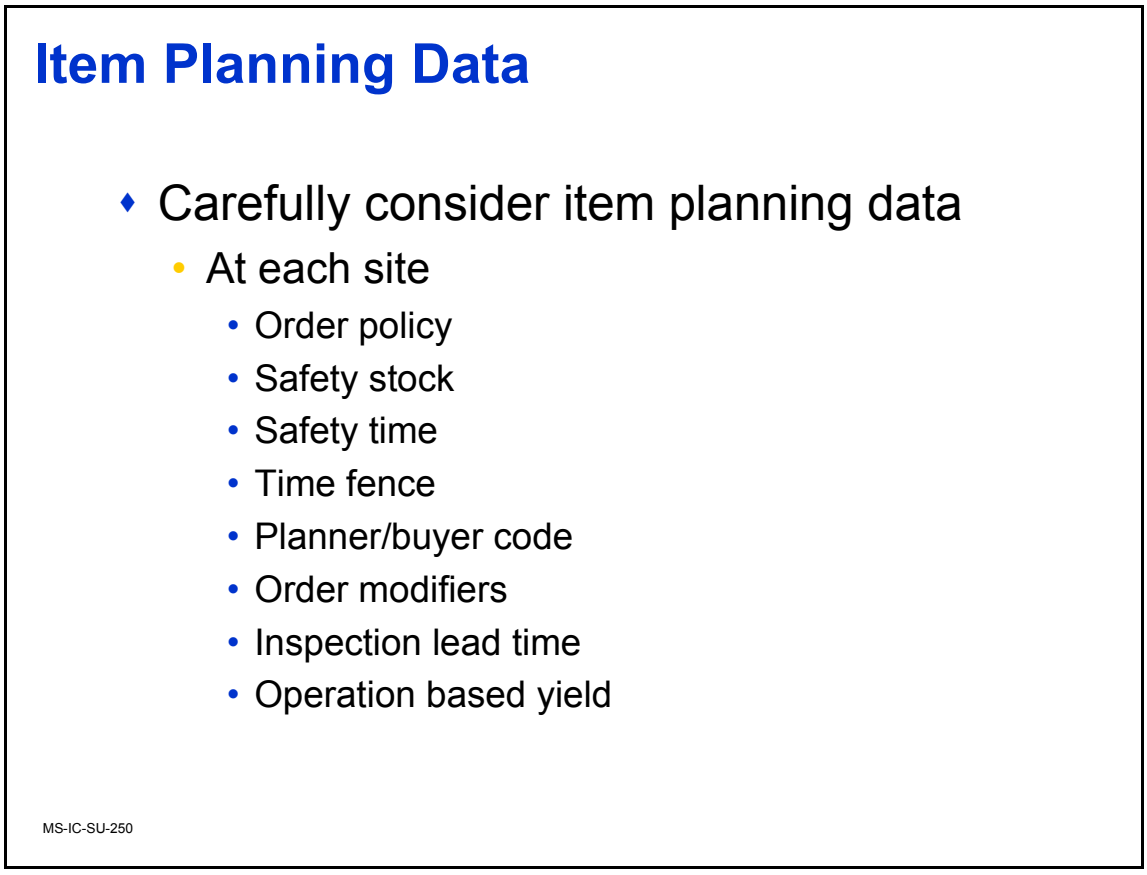
(Please note that is: gplu zero seven two.p)

5 Use Unit of Measure Maintenance 1.13 to verify the conversion of ML to L as 1000 and from L to ML as 0.0010. If these are not in your database, add them.

a Add a conversion for EA to CS for item 02-2000 of 24.

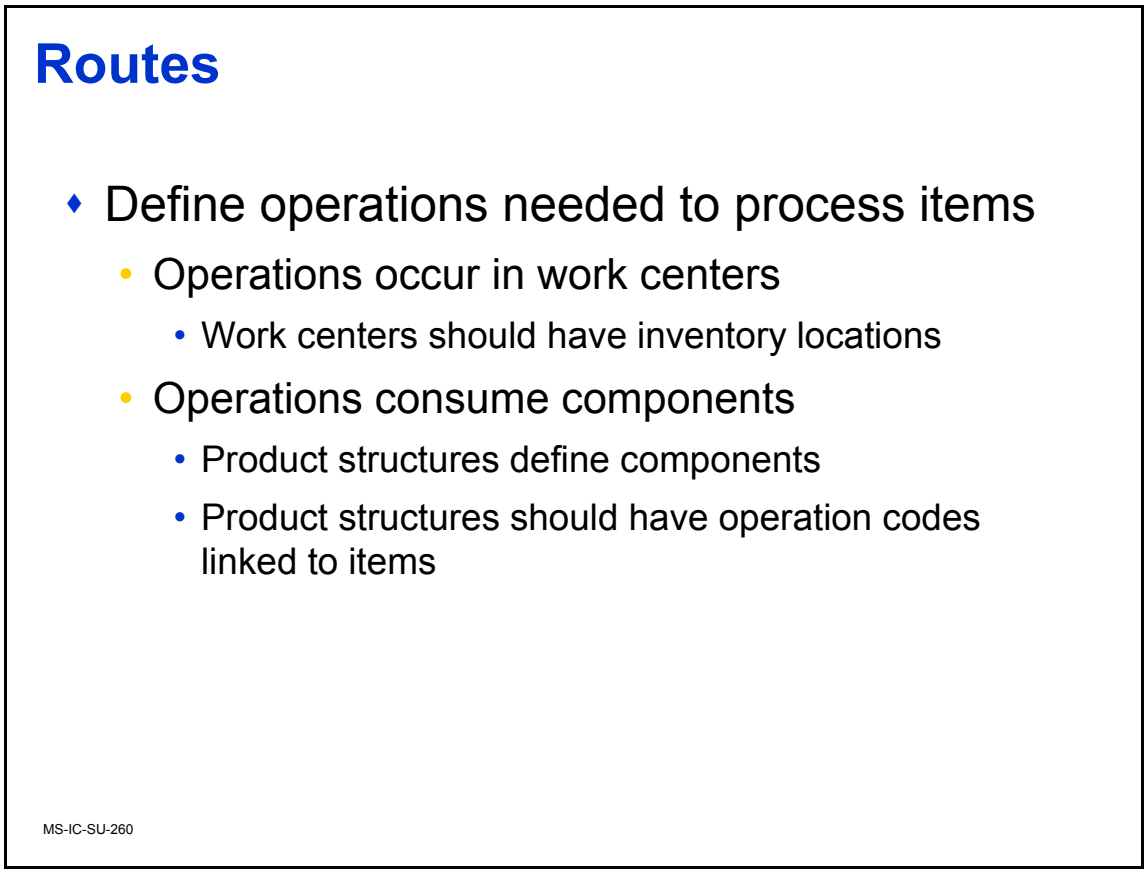
b Add a conversion for ML to CS for item 09-0005 of 24,000. (A case of electroplate has 24 one-liter bottles, or 24,000 ML.)

Note The item will be added later.



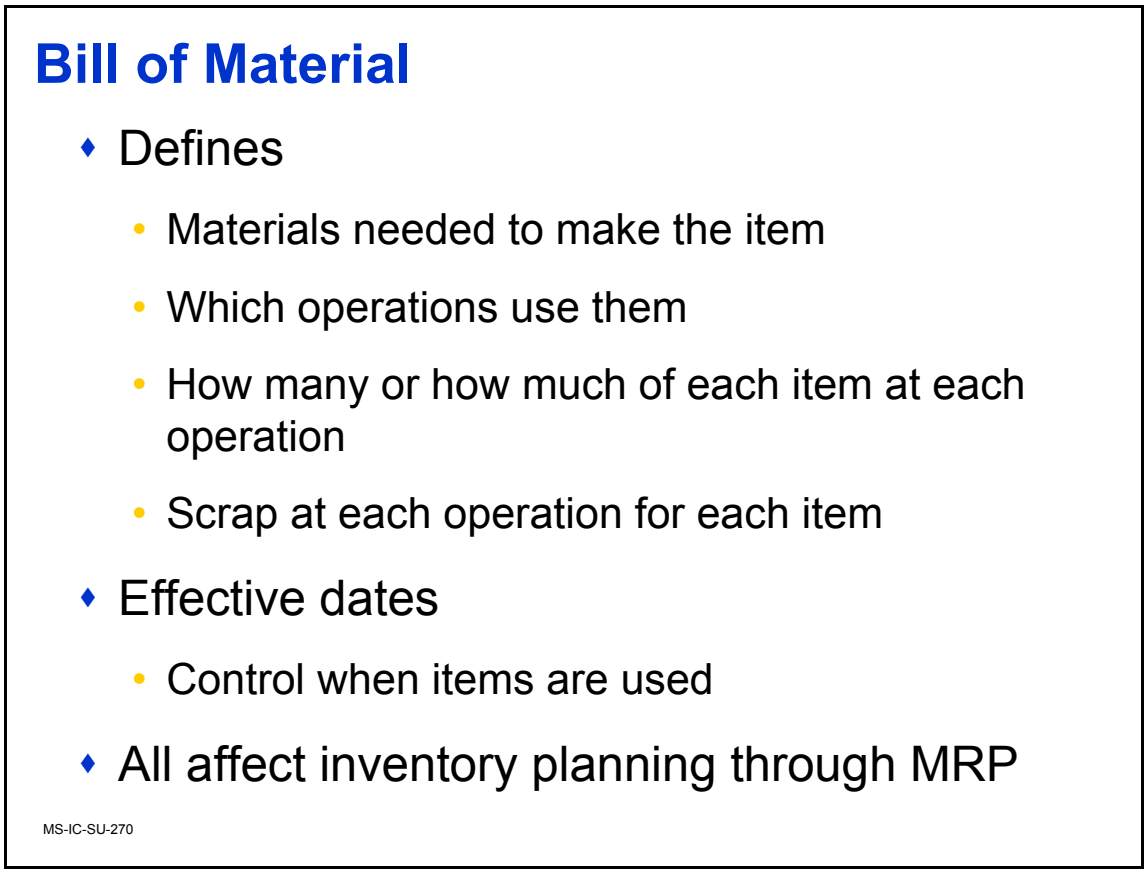
Item Planning Data

By Site



Routes

Define Operations

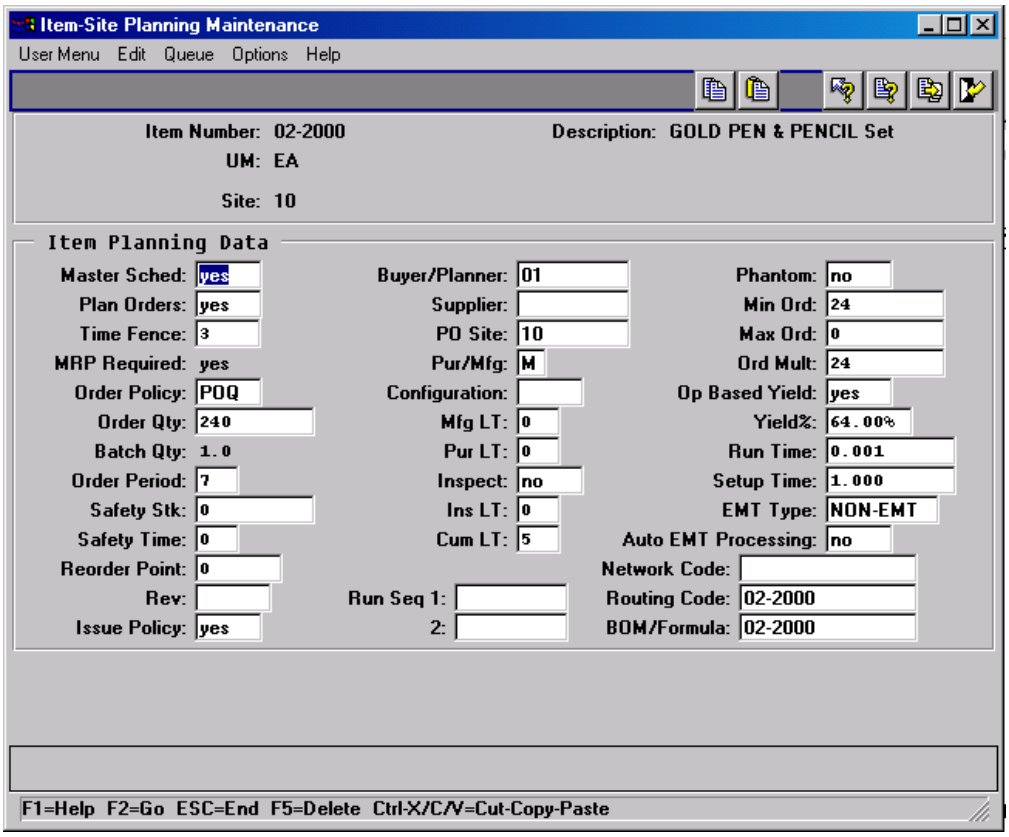


Bill of Material

Setup Activities

Item Planning Data Quiz

1 On the screen shown below, circle all the fields that have any effect on inventory management.



2 Use Item Planning Maintenance 1.4.7 to set up the following Item Planning Data:

Item No:	02-2000	04-0010
Site:	10	10
Master Schedule:	Yes	No
Plan Orders:	Yes	Yes
Time Fence:	3	<blank>
Order Policy:	POQ	POQ
Order Quantity:	240	1000
Order Period:	7	7
Safety Stk:	<blank>	<blank>
Safety Time:	<blank>	<blank>
Issue Policy:	Yes	Yes
Buyer/Planner:	01	01
PO Site:	10	10
Pur/Mfg:	M	P
Pur Lt:	<blank>	10
Inspect:	<blank>	<blank>
Ins LT:	<blank>	<blank>
Min Ord:	24	1000
Max Ord:	<blank>	<blank>
Ord Mult:	24	100
Routing Code:	02-2000	<blank>
BOM/Formula:	02-2000	<blank>

3 Use Item Master Copy 1.4.12 to create the following items from 04-0010. Update the few fields that are different for 09-0005 (shown in bold typeface):

Item No:	04-0020	09-0005	09-0010
UM:	EA	ML	EA
Description:	Pen	Gold Electroplate	Box
Prod Line:	1100	1100	1100
Promo Group:	pg1	pg1	pg1
Item Type:	COMP	COMP	COMP
Status:	AC	AC	AC
Group:	PUR	PUR	PUR
Lot/Serial Control:	<blank>	**L**	<blank>
Site:	10	10	10
Location:	100	**110**	100
Location Type:	<blank>	**SAFE**	<blank>
Auto Lot Numbers:	NO	NO	NO
Lot Group:	<blank>	<blank>	<blank>
Cyc Cnt Int:	30	30	30
Shelf Life:	<blank>	**180**	<blank>
PO Rcpt Status:	GOOD	**MAYBE**	GOOD
WO Rcpt Status:	<blank>	<blank>	<blank>
Active:	Yes	Yes	Yes

Note The item copy function takes you through all the Master File screens (inventory data, planning data, and cost data) to modify fields as required.

Item No:	04-0020	09-0005	09-0010
Site:	10	10	10
Master Schedule:	No	No	No
Plan Orders:	Yes	Yes	Yes
Time Fence:	<blank>	<blank>	<blank>
Order Policy:	POQ	POQ	POQ
Order Quantity:	1000	**<blank>**	1000
Order Period:	7	7	7
Safety Stk:	<blank>	**1000**	<blank>
Safety Time:	<blank>	<blank>	3
Issue Policy:	Yes	Yes	Yes
Buyer/Planner:	01	01	01
PO Site:	10	10	10
Pur/Mfg:	P	P	P
Pur Lt:	10	15	2<blank>
Inspect:	<blank>	**Yes**	<blank>
Ins LT:	<blank>	**2**	<blank>
Min Ord:	1000	1000	1000
Max Ord:	<blank>	<blank>	<blank>
Ord Mult:	100	**1000**	100
Routing Code:	<blank>	<blank>	<blank>
BOM/Formula:	<blank>	<blank>	<blank>

4 Use Item Cost Maintenance 1.4.9 to add Item Purchase Material Costs. Be sure you update the Current Cost Set for Site 10.

Item Purchase Costs	Current Cost Set
04-0010	$5.00
04-0020	$5.00
09-0005	$1.00
09-0010	$5.00

5 Set up the Pen & Pencil Work Center and Route. Use Work Center Maintenance 14.5 and Routing Maintenance (Rate Based) 14.13.2.

a In 14.5, set up work center 10 Electro-Plating in Department 10:

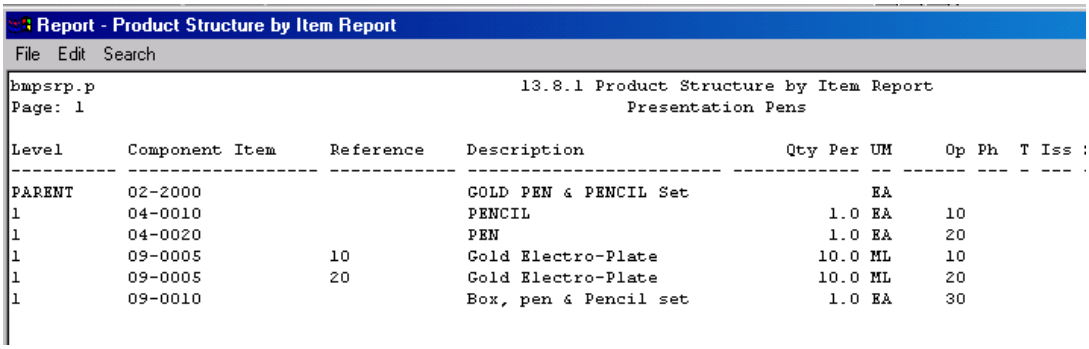
Mach Bdn Rate:	$100
Set Up Rate:	$50
Labor Rate:	$25
Lbr Bdn %:	100

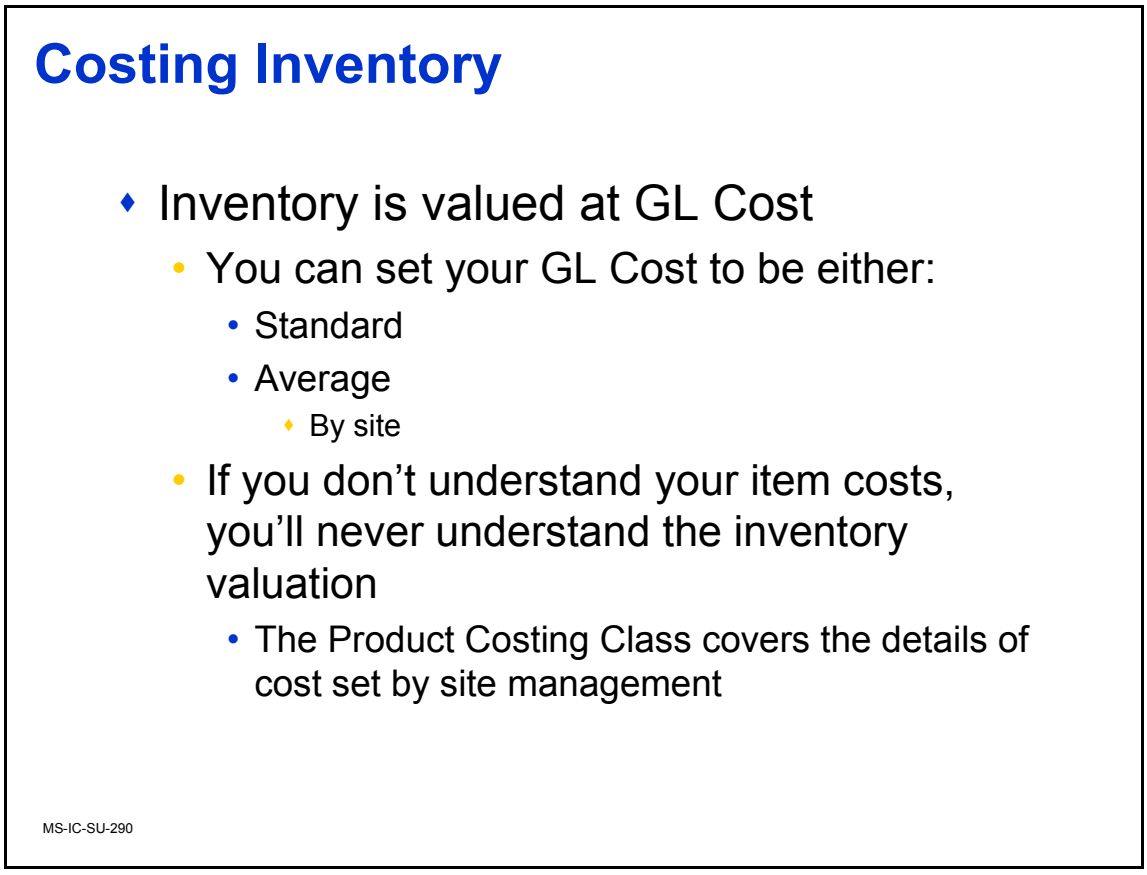
b In 14.13.2, set up the following operations:

02-2000 Route	W.C.	Description	Overlap	Setup	Hourly Rate
OP 10	10	Plate Pencils	1	1	30
OP 20	10	Plate Pens	1	1	30
OP 30	10	Package	1	1	60

6 Use Product Structure Maintenance 13.5 to set up your product structure.

a Be sure that you use the reference field for the gold and include the operation number from the route for each item.





Costing Inventory

Setup Activities

Routing Cost Roll-Up

1 Use Routing Cost Roll-Up 14.13.13 to run routing cost roll-up.

   a Run the report for site 10, Current Cost Set, item 02-2000.

   b Accept all other defaults.

   c Direct the output to the Window.

2 Run Product Structure Cost Roll-Up 13.12.13.

   a Run the report for Site 10, current cost set, and for product lines 1010 to 1100.

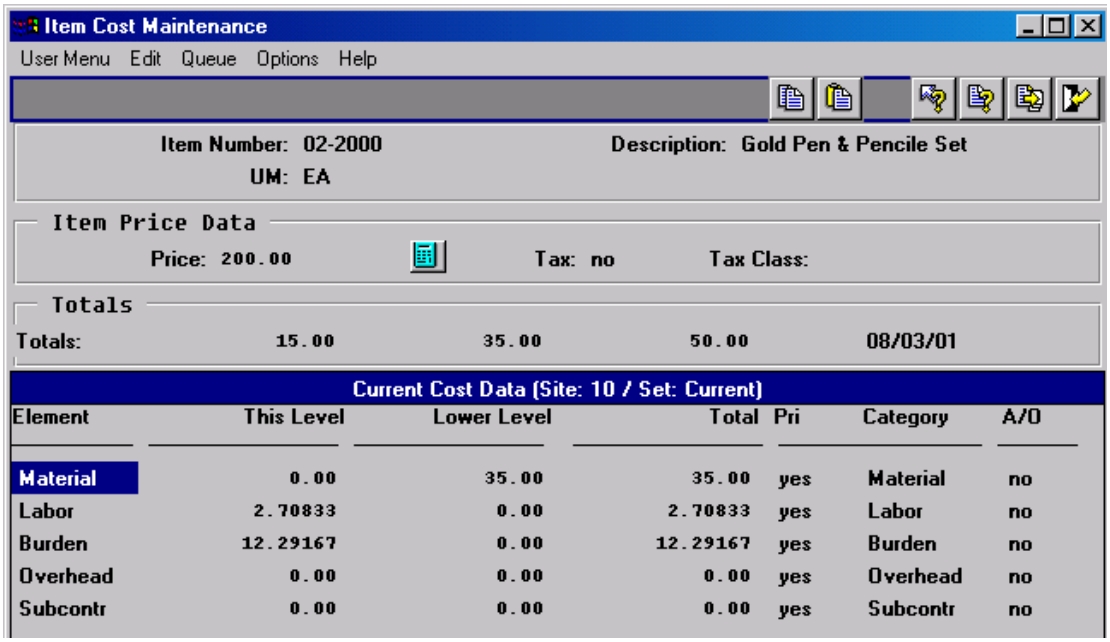
   b Direct the output to the Window.

3 Run Cumulative Lead Time Roll-Up 13.12.14.

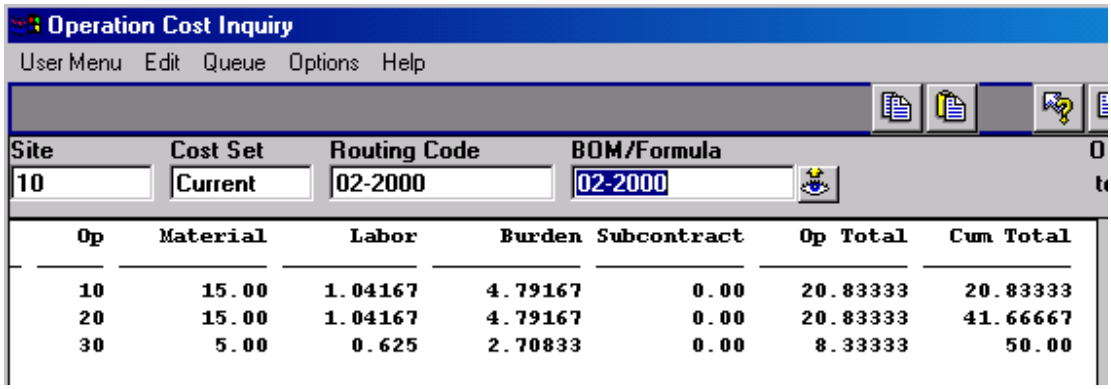
- **a** Select item 02-2000.
- **b** Direct the output to the Window.

4 Review your costs using Item Cost Maintenance 1.4.9.

- **a** As you enter screen 1.4.9, set your Price for the 02-2000 to $200.00.
- **b** Your total cost for the 02-2000 Current Cost Set at Site 10 should be $50.
- **c** If it is much higher, check to be sure that your order quantity for item 02-2000 in Item Planning Data 1.4.7 is set to 240.



d The detail of operation costs can be seen in Operation Cost Inquiry 14.13.18.



Op	Material	Labor	Burden	Subcontract	Op Total	Cum Total
10	15.00	1.04167	4.79167	0.00	20.83333	20.83333
20	15.00	1.04167	4.79167	0.00	20.83333	41.66667
30	5.00	0.625	2.70833	0.00	8.33333	50.00

Current Cost Set Move to GL Set

5 When your costs are correct, use Current Cost Set Move to GL Set 1.4.22 to copy the cost data to the GL data set.

a Select site 10, and type a question mark (?) in the Pct Change Allowed fields.

b Check Item Cost Maintenance 1.4.9 to be sure your GL Cost and Current Cost are the same.

Inventory Control File (1 of 4)

- Important control file (3.24)
  - Count out-of-tolerance setting
    - Used by cycle count and physical inventory
      - Set by ABC class
    - Measured from quantity on hand or annual usage
      - Annual usage calculated by the ABC Status Report
      - Uses averaging interval from item inventory data
    - Currency tolerance is not affected by this setting
  - Item tolerances
    - Set by ABC class
    - Set by percent and currency

MS-IC-SU-310

Inventory Control File

Menu Number 3.24

Item Tolerances

Inventory Control File (2 of 4)

- Current Cost
  - Last
    - Purchase or work order close updates current cost
    - Assumes next cost will likely be closest to this value
    - Track variance between standard and current
    - Current period variances are posted to GL
  - Average
    - Purchase or work order close updates a weighted average cost for all like items in inventory
    - Assumes costs are beyond control
    - Can track a variance between annual standard and current average, or make the GL cost an average
    - No current period variances booked
  - None
    - No automatic cost update at all

MS-IC-SU-320

Current Cost

Refer to the Product Costing and Cost Management training guide for details.

Inventory Control File (3 of 4)

- Sum lower level costs into material cost
  - Only affects reporting
  - All costs kept at all levels
- Current cost from Accounts Payable (AP)
  - AP vouchering may create an AP rate variance
  - Determines whether AP price should update current cost
- Transfer clearing account
  - Cost variances from inter-site transfers booked
- Inter-company account
  - Cost variances from inter-entity transfers booked

MS-IC-SU-330

Lower Level Costs

Current Cost from Accounts Payable

Transfer Clearing Account

Inter-company Account

Inventory Control File (4 of 4)

- Picking logic
  - Also used for allocations
  - Has significant effect on how inventory moves
  - Secondary and tertiary selection logic
  - Ascending or descending
    - Location, lot/serial
      - Useful if location sequence is important
    - Lot/serial, location
      - More useful if you use lot numbers
    - Date, location, lot/serial
      - FIFO or LIFO
      - Requires use of lot, serial, or reference to get unique date
    - Expire date, location, lot/serial
      - Great for age-dated items

MS-IC-SU-340

Picking Logic

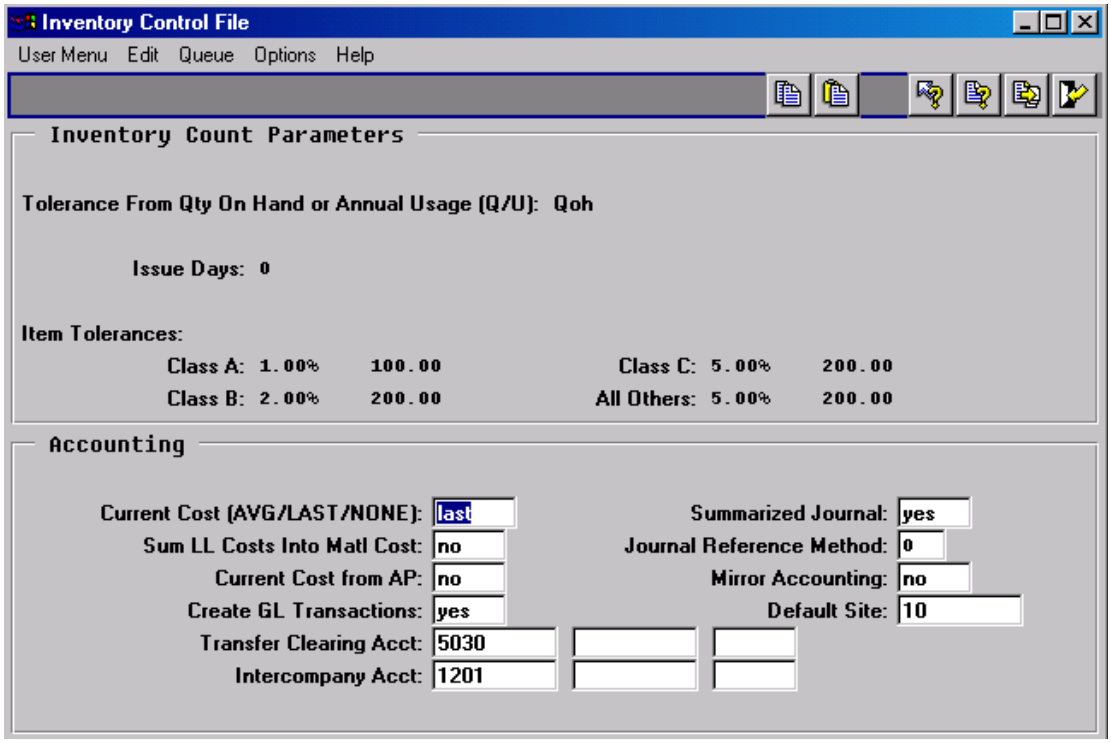
Setup Activities

MS-IC-SU-350

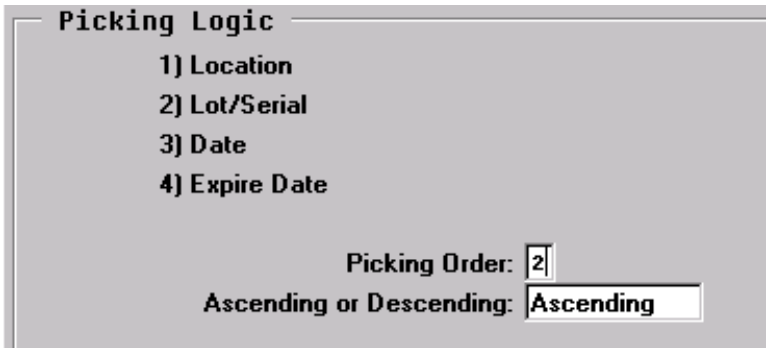
Setup Activities

Inventory Control File

1 Set path Inventory Control File 3.24 so that it looks like this:



2 Set the pick logic to 2, ascending.



Course Overview

- ✓ Introduction to Master Series: Best Practice Inventory Management
- ✓ Business Considerations
- ✓ Set up Best Practice Inventory Management
- ♦ Use Best Practice Inventory Management

MS-IC-SU-400

CHAPTER 4

Use Best Practice Inventory Management

Use Best Practice Inventory Management

In this section you learn how to:

- ✓ Identify some key business considerations before setting up Best Practice Inventory Management
- ✓ Set up Best Practice Inventory Management
- ✓ **Use Best Practice Inventory Management in MFG/PRO**

MS-IC-USE-010

FIFO and LIFO

- Financial concepts
  - Balance sheet reporting of inventory values
  - MFG/PRO values inventory at GL standard cost
- Picking logic can insure physical control
  - FIFO or LIFO
    - Use date ascending or descending
    - Use lot/serial or reference codes to get unique lot dates
  - European Accounting Module handles FIFO or LIFO
    - See Addendum to European Accounting User Guide
      - Inventory Evaluation and Simulation (30.18)

MS-IC-USE-015

First In, First Out (FIFO)

Last In, Last Out (LIFO)

Purchasing Interface

- Much inventory is purchased
  - Receiving is where inventory control starts
- All suppliers in database
  - Set up supplier items for different unit of measures
    - Supplier quotes
    - Multiple suppliers for same items
- Control overshipments
    - Don’t let them become “over-receipts”
    - Set tight tolerances
    - Use one receiver per item

MS-IC-USE-016

Purchasing Interface

Processing Purchase Receipts

- Everything is received from purchase orders (POs)
  - Only for the quantity open on the PO
  - Only on its due date – What's your tolerance?
    - Early three days, late none?
- Everything immediately processed physically and electronically
  - Within four hours (pick your tolerance)
- Discrepancies resolved before goods moved
- No unplanned receipts
- No issues until material is received

MS-IC-USE-020

Purchase Receipts

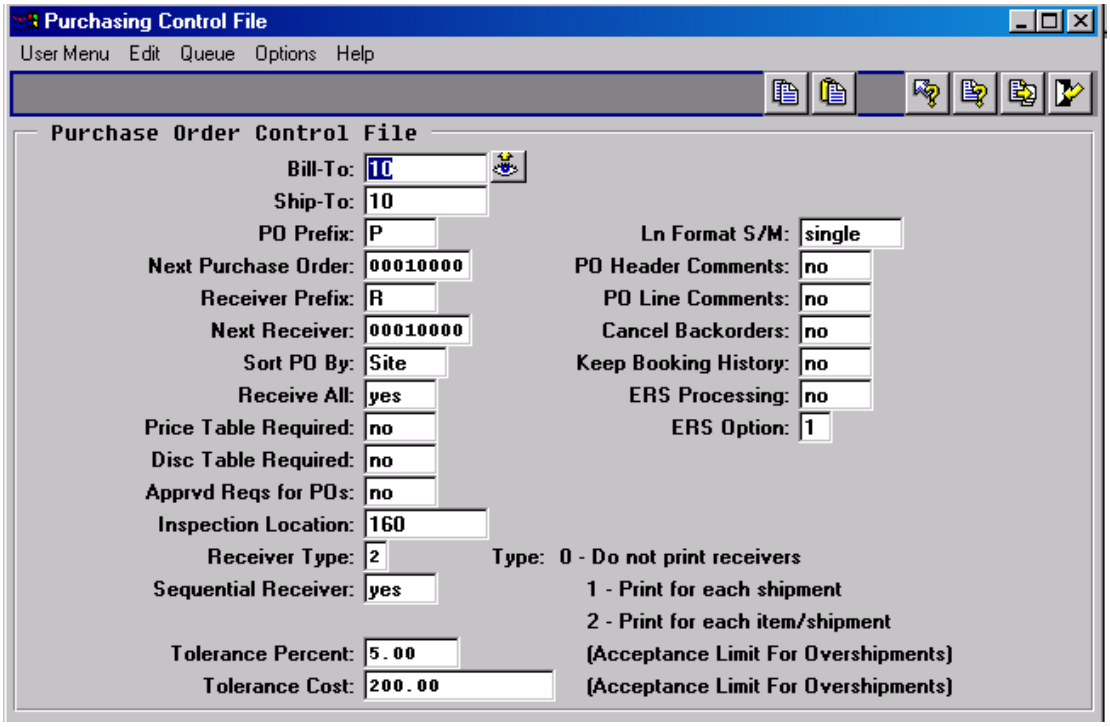
Processing Activities

MS-IC-USE-030

Processing Activities

Purchasing Control File

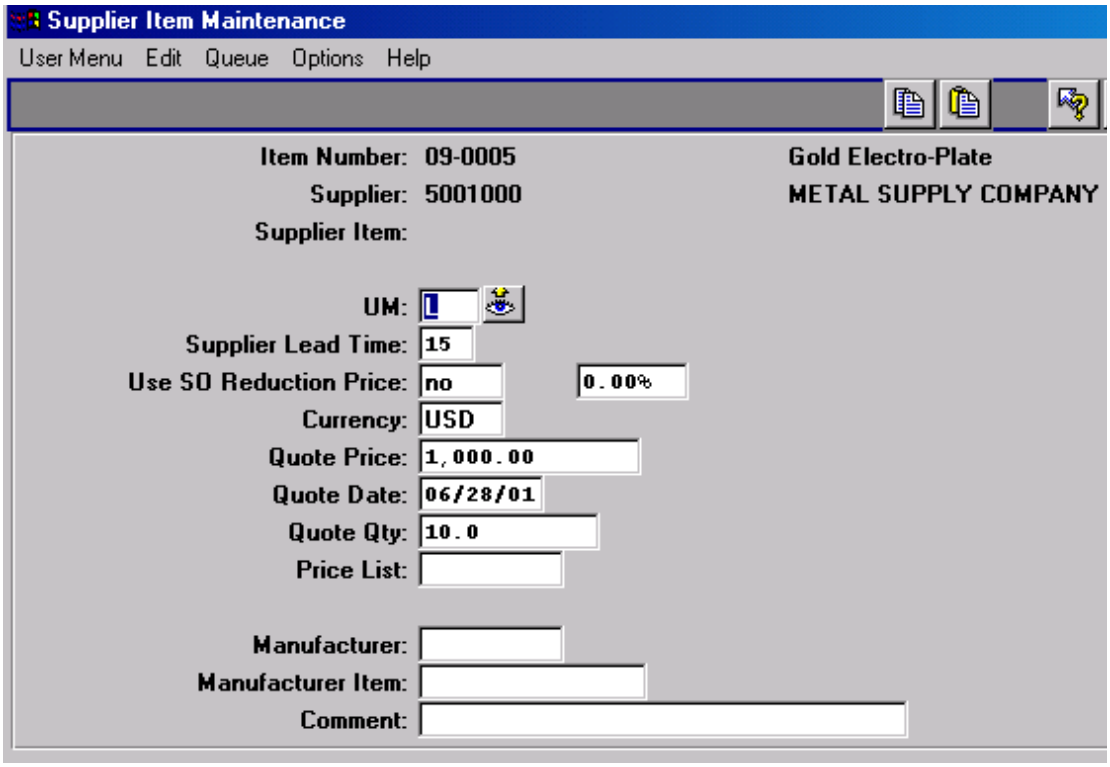
1 Set up Purchasing Control File 5.24 so that it looks like this:



2 Use Supplier Item Maintenance 1.19 to set up supplier item for Gold Electro-plate.

a Supplier sells only in one liter flasks.

b Make your setup look like this:



3 Use Purchase Order Maintenance 5.7 to create a new purchase order.

a Let the system assign the PO number.

b Select supplier 5001000. We will use this supplier for all items to make things easier for the activity. Normally we would have at least three POs for these types of materials.

c Your PO should default to your site 10. If it does not, check control file settings in 5.24.

d Let order date and due date default; no, we don't have enough lead time. (We are cheating.)

e Setting site to 10 on the header will default it to the line items. Press the Go key until you see the line items screen.

f Enter line one for item 09-0005, Qty. 10.

g Unit of measure should default to L from the supplier item record and the price should be $1000.00.

Note Extended Net Cost, at bottom right of PO, = $10,000.00. Note that location defaults to 160 as this item requires inspection (set up in Item Planning Maintenance 1.4.7) and 160 is the inspection location (set up in Purchase Order Maintenance 5.24). The system also displays the Unit of Measure conversion.

h If you get a message about the item having no cost, it probably means you missed the step in the activity on page 92 where we copied the current cost to the GL cost. Inventory uses GL costs for valuation.

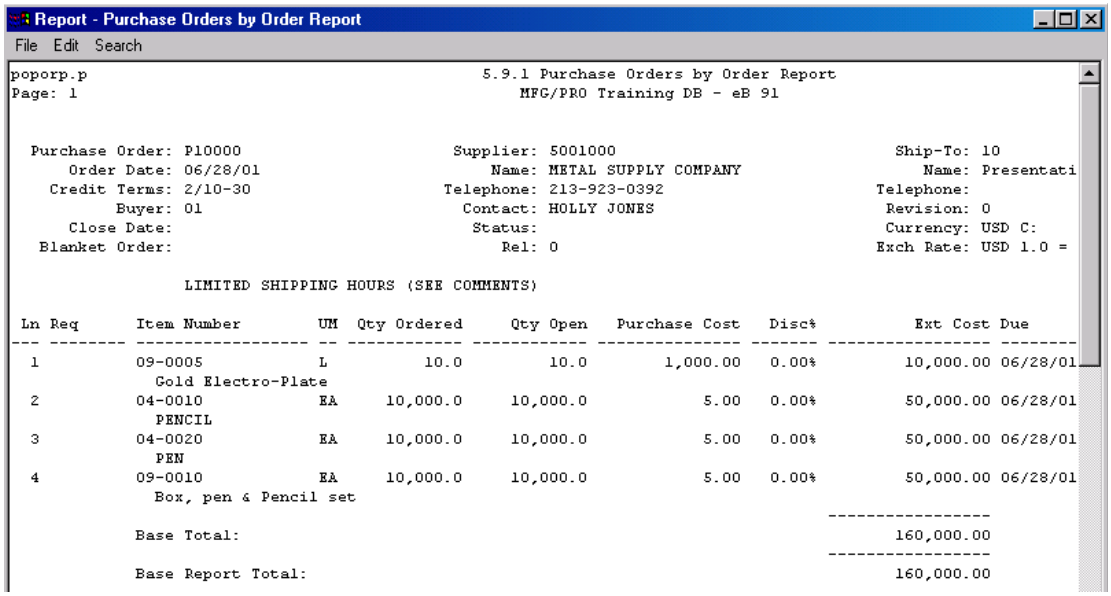
i Enter line two for item 04-0010, qty. 10,000.

j Enter line three for item 04-0020, qty. 10,000.

k Enter line four for item 09-0010, qty. 10,000.

l Escape to PO trailer and Press Go to complete the PO.

To view your PO, use either Purchase Order Print 5.10 or Purchase Orders by Order Report 5.9.1. Your PO should look like this:



Report - Purchase Orders by Order Report

File Edit Search

```
poporp.p                                    5.9.1 Purchase Orders by Order Report
Page: 1                                        MFG/PRO Training DB - eB 91


  Purchase Order: P10000                  Supplier: 5001000                    Ship-To: 10
      Order Date: 06/28/01                    Name: METAL SUPPLY COMPANY          Name: Presentati
    Credit Terms: 2/10-30                Telephone: 213-923-0392              Telephone:
           Buyer: 01                       Contact: HOLLY JONES                Revision: 0
      Close Date:                           Status:                             Currency: USD C:
   Blanket Order:                              Rel: 0                           Exch Rate: USD 1.0 =

                 LIMITED SHIPPING HOURS (SEE COMMENTS)

 Ln Req      Item Number        UM  Qty Ordered     Qty Open   Purchase Cost   Disc%          Ext Cost Due
--- -------- ------------------ -- ------------ ------------ --------------- ------- ----------------- --------
  1          09-0005            L          10.0         10.0        1,000.00   0.00%         10,000.00 06/28/01
               Gold Electro-Plate
  2          04-0010            EA     10,000.0     10,000.0            5.00   0.00%         50,000.00 06/28/01
               PENCIL
  3          04-0020            EA     10,000.0     10,000.0            5.00   0.00%         50,000.00 06/28/01
               PEN
  4          09-0010            EA     10,000.0     10,000.0            5.00   0.00%         50,000.00 06/28/01
               Box, pen & Pencil set
                                                                                  -----------------
             Base Total:                                                                 160,000.00
                                                                                  -----------------
             Base Report Total:                                                          160,000.00
```

4 Use Purchase Order Receipts 5.13.1 to receive your PO.

a Your receipt screen should default to receive all = Yes. This sets the system up with all items on the PO to be received with the complete quantity. You can still make adjustments as required.

b Line one, the 09-0005 Gold Electro-Plate requires a lot number. If you forget, the system reminds you. Enter lot number 123 and enter a supplier lot number (any old number will do).

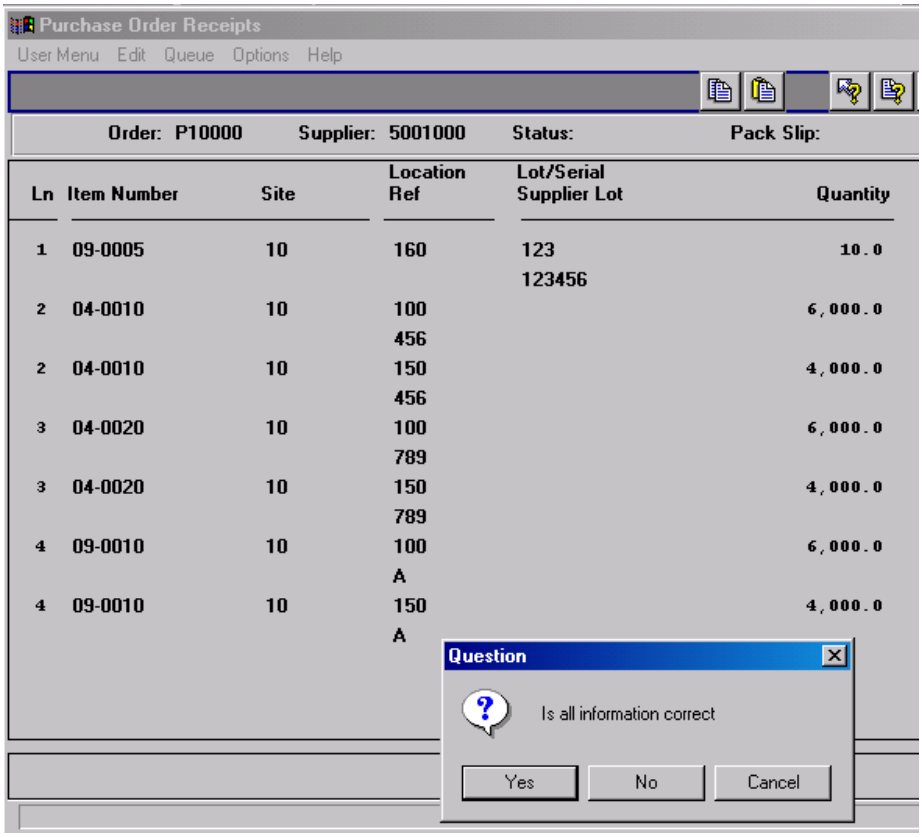
c Accept other defaults. This will receive the 10 one-liter bottles into location 160. The system will convert the 10 bottles into 10,000ML automatically.

d Receive line two and add a Ref 456, then select Multi Entry = Yes. This brings up a Window that allows you to record multiple lines for the same item.

e Receive 6,000 of the 04-0010 into location 100 and 4000 into location 150.

f Do the same for line three with the Ref 789.

g Put 6,000 into location 100 and 4,000 into location 150.



h Receive line four in a similar fashion. Use Ref A and again select Multi Entry and Change Attributes = Yes.

i Put 6,000 into location 100 and 4,000 into location 150.

j As you Esc from this screen, the change attributes screen will pop up. Enter a Grade Code of C for the boxes. (Don't know what grade C means – we're just testing the functionality.)

This activity demonstrates that you can use lot serial or reference codes whether the item has lot control set to Yes or not. We have also seem multiple entry and change attributes.

k When you select Display Purchase Order Lines being Received = Yes, you get a screen displaying the detail of the transaction about to be processed.

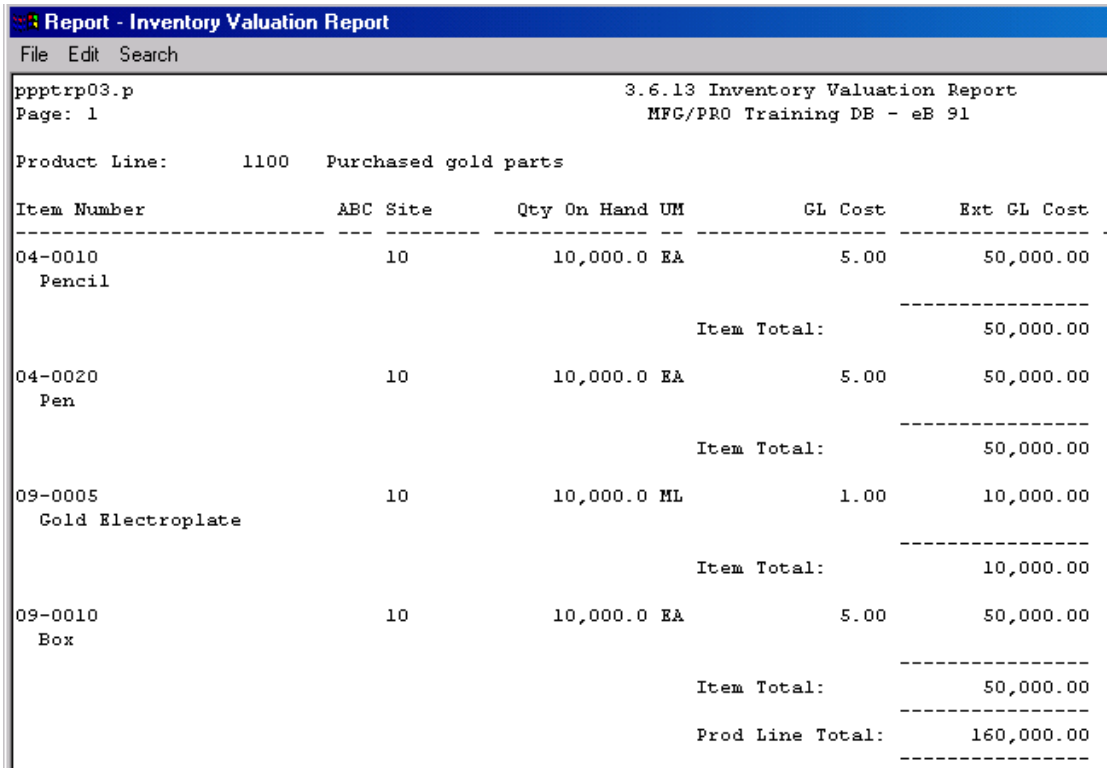
l You can review your receipts with any of the inventory inquires or reports. Try using Inventory Detail by Site Browse 3.3 for site 10, then use the space bar to cycle through the items.

m Also try the Stock Status Report 3.6.1 for site 10.

n Set the output to the Window. Does all the data look correct?

o Check the Inventory Valuation Report 3.6.13 for /site 10.

If you have done the activity as designed, the total value of your inventory at this point should be $160,000.00.


Report - Inventory Valuation Report

File Edit Search

```
pptrp03.p                                    3.6.13 Inventory Valuation Report
Page: 1                                        MFG/PRO Training DB - eB 91

Product Line:      1100   Purchased gold parts

Item Number                ABC Site       Qty On Hand UM          GL Cost      Ext GL Cost
-------------------------- --- -------- ------------- -- ---------------- ----------------
04-0010                        10            10,000.0 EA              5.00        50,000.00
  Pencil
                                                                            ----------------
                                                          Item Total:           50,000.00

04-0020                        10            10,000.0 EA              5.00        50,000.00
  Pen
                                                                            ----------------
                                                          Item Total:           50,000.00

09-0005                        10            10,000.0 ML              1.00        10,000.00
  Gold Electroplate
                                                                            ----------------
                                                          Item Total:           10,000.00

09-0010                        10            10,000.0 EA              5.00        50,000.00
  Box
                                                                            ----------------
                                                          Item Total:           50,000.00
                                                                            ----------------
                                                          Prod Line Total:     160,000.00
                                                                            ----------------
```

Smaller Lots

- One key to control is smaller lots
  - Use lot numbers, reference numbers, and/or:
    - Expiration dates, grade, assay, or lots of locations
- Easier to count and control
  - The JIT concept reduces lot size to one
- Visibility critical
  - If you can't see it, you can't control it
  - High usage volume items require lowest inventory
  - Low usage items maintained where seen and controlled
    - Work center locations

MS-IC-USE-040

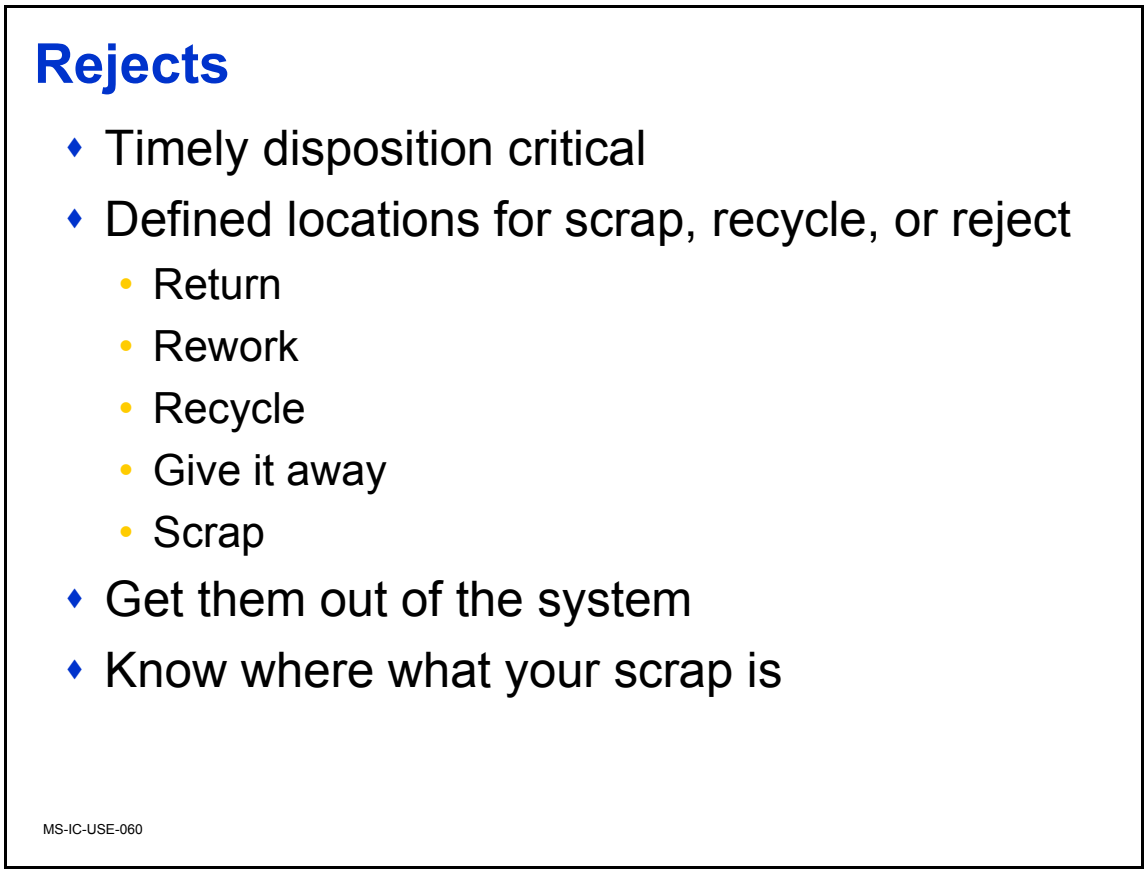
Key to Inventory Management

Reference Numbers

- To control FIFO, make reference a date code
  - Any reference allows a unique date record
- Super set of serial number
  - All these serials were processed with this lot
- Sub-set of lot number
  - This serial is unique within this lot
- Pallet reference (drum, cargo container)
  - Ten pallets, numbered one – ten contain this lot
- Anything that helps control and identify inventory

MS-IC-USE-050

Reference Numbers



Rejects

Processing Activities

Inspection of Received Material

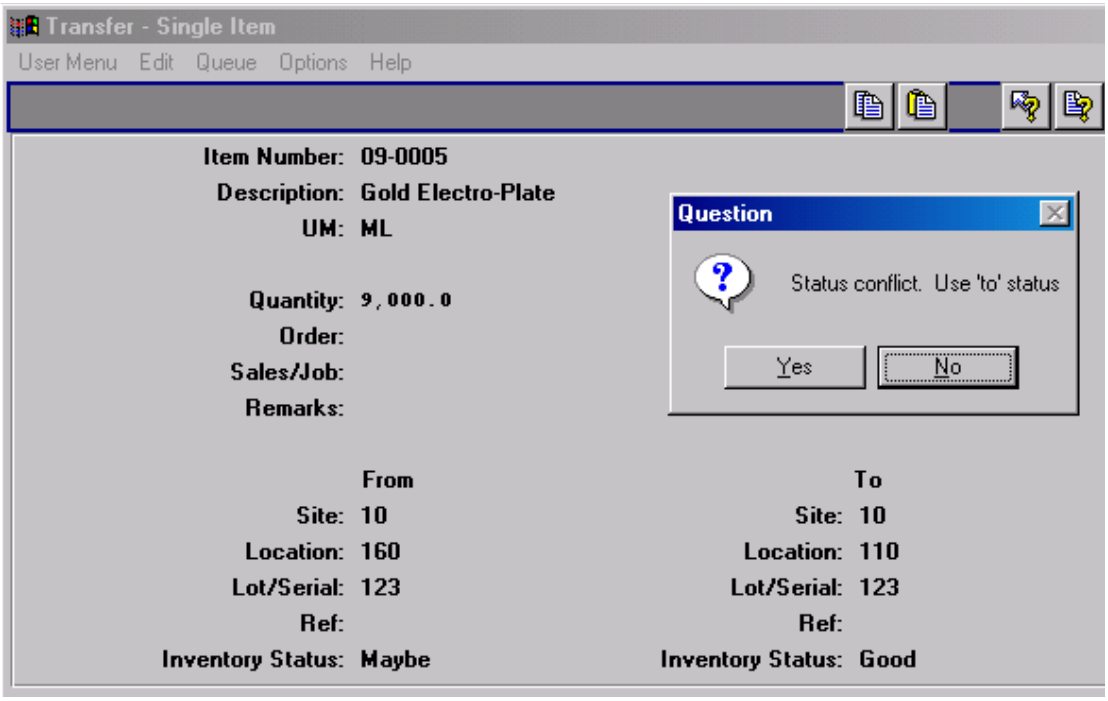
1 The 09-0005 Gold Electro-Plate requires an inspection before it can be moved into normal stores locations and given status Good.

This might normally be done using Quality Order Maintenance 19.7 to insure adequate control; however, we will use a shortcut.

Assume we have checked the material and found 9 liters to be OK and one liter to be suspicious.

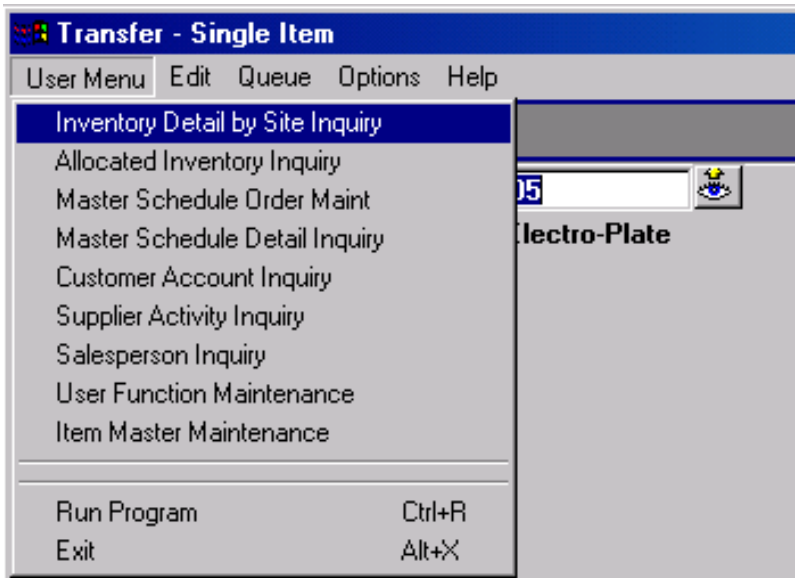
Low Control Method

2 Use Transfer - Single Item 3.4.1 to transfer the 9,000 ML from location 160 to location 110. You will get a status conflict message. Click on the Yes button and the transaction completes.



3 Alternately you can change the status first using Inventory Detail Maintenance 3.1.1, which we will do for the other bottle.

Remember if you forget a lot or reference number, you can always check inventory details at anytime.



4 Using Inventory Detail Maintenance 3.1.1, change the status of the 1,000 ML of 09-0005 still in location 160 to No Good.

The material can be returned to vendor (RTV) using Purchase Order Returns 5.13.7 or, with agreement from the vendor, scrapped. The preferred method is RTV because this corrects all the booking transactions automatically.

Any other method requires human intervention to book the correcting inventory and accounting transactions.

Disposition of the No Good 09-0005

1 Check Inventory Detail by Site Inquiry 3.3 for this item.

2 Check Stock Availability Inquiry 3.17. See the difference?

3 Use Purchase Order Returns 5.13.7 to return the Gold Electro-Plate for replacement.

a Use the original PO.

b Answer Yes to the message: Reopen PO.

c Set Return All to No.

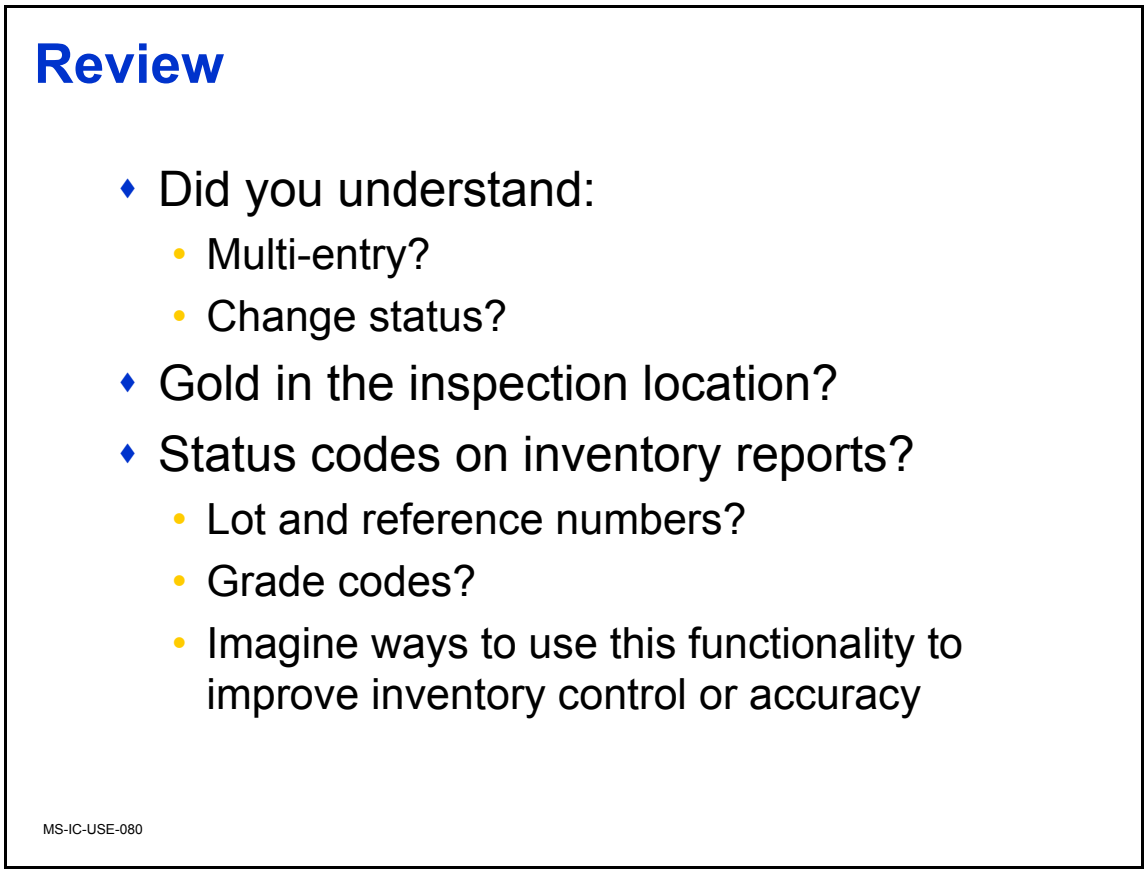
d Set Return for Replacement to Yes.

e Fill in line one to return 1 of Lot 123.

4 Check Stock Availability Inquiry 3.17. You should see 9,000 on hand and available and 1,000 on order.

5 Optional

Use the User Function Maintenance screen (pull down user menu) or User Function Maintenance 36.4.11 to add the most used inquiries and reports, such as Stock Availability Inquiry 3.17, Inventory Detail Report 3.6.5, Inventory Valuation Report 3.6.13, and so forth.



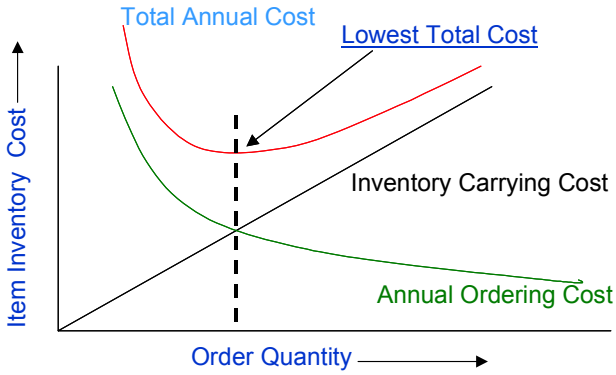
Review

Economic Order Quantity vs Smaller Lot Size

Economic Order Quantity (EOQ)
The wave of the past comes round again

$$EOQ = \sqrt{\frac{2\,Cp * A}{Ch}}$$

Cp = Cost of placing order, currency units
A = Annual Demand, units
Ch = Cost of Carrying Inventory, % of Inv. value



The cost of carrying an item in inventory needs to factor such elements as the cost of a stock out and the risk of obsolescence, as well as the overhead associated with the storage facility.

MS-IC-USE-090

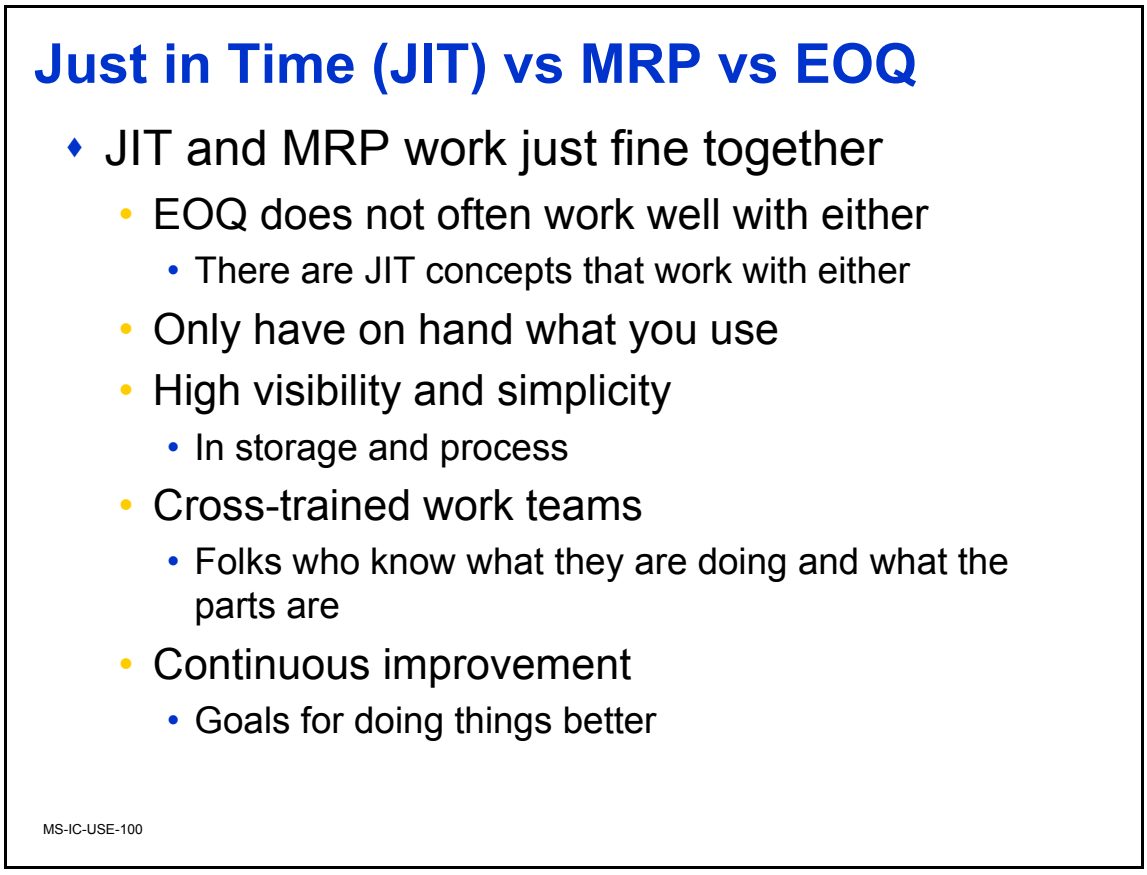
Economic Order Quantity (EOQ) vs Smaller Lot Size

Historically, EOQ has gotten bogged down in the calculation of the order of placing an order, or order cost as it is referred to. In some cases this is as silly as taking the entire overhead of the purchasing function and dividing by the average number of purchase orders placed in a year. Or on the manufacturing side the entire overheard associated with the planning function divided by number of work orders per year. In a JIT environment there are no work orders, but rather pull signals and the workers in the flow cell are often responsible for requesting replenishment parts from their suppliers.

EOQ has also often been confused about the best way to calculate set up cost which is a part of order cost. If the goal is to generate large batch sizes (which production traditionally has liked) all kinds of ways will be found to inflate set up time and cost. When the goal becomes not having any inventory we get very creative in reducing set up time and cost.

The Carrying Cost of inventory usually gets inflated because we usually assume the overhead associated with the warehouse is fixed. If we revise our thinking to assume a smaller warehouse or no warehouse (items stored at the point of consumption) we get very different answers. Carrying cost also seldom correctly costs the risk of obsolescence, excess, or expiration of material.

EOQ could be used to calculate kanban quantities if we take a fresh approach to defining order cost and carrying cost of inventory.



Just in Time (JIT) vs MRP vs EOQ

In a JIT environment with MRP the work order is usually replaced with a repetitive schedule whose planned quantity for a given period is the sum of the maximum kanban quantities possible in that period. Actual production reported will be driven by the kanban signals.

In a JIT environment the need for greater inventory accuracy should be evident. The goal of continuous improvement in inventory accuracy becomes one of the JIT of continuous improvement goals.

Safety Stock

Processing Activities

Create Safety Stock Location

1 We have decided the 09-0005 Gold Electro-Plate needs safety stock. Using Location Maintenance 1.1.18 for site 10.

   a Create a Location 170, Safety Stock, Status = Safe Stk (previously defined) and type "Safe."

   b Review Location Inquiry 1.1.19 to be sure data is correct.

2 Use Purchase Order Receipts 5.13.1 to receive the PO for the replacement 09-0005 Gold Electro-Plate.

3 The only open line on this PO should be line five. Receive lot number 789.

The receipt will put the one liter bottle into location 160, the inspection location, as 1,000ML.

4 Create Safety Stock of 09-0005 Gold Electro-Plate.

- **a** Use Transfer - Single Item 3.4.1 to transfer the 09-0005 Gold Electro-Plate from location 160 to location 170.
- **b** Is all information correct = Yes (when prompted).

5 Check Inventory Detail by Site Inquiry 3.3 to see current status of your inventory of 09-0005 Gold Electro-Plate.

6 Check Stock Availability using Inquiry 3.17 and Allocated Inventory Inquiry 3.18.

Note the difference between the two inquires.

7 Run Stock Status Report 3.6.1 to the Window for site 10 and item 09-0005.

Note that you can see the records of the places where the 09-0005 was.

8 Run the Inventory Detail Report 3.6.5 for site 10 and item 09-0005.

Note the differences.

9 Run Zero Balance Delete/Archive 3.23, for site 10.

- **a** Set Delete to Yes.
- **b** Set Archive to No.

This function does as the name implies – it deletes those records with a zero balance, in the range of sites, location, items, etc., selected.

10 Check Inventory Detail by Site Inquiry again.

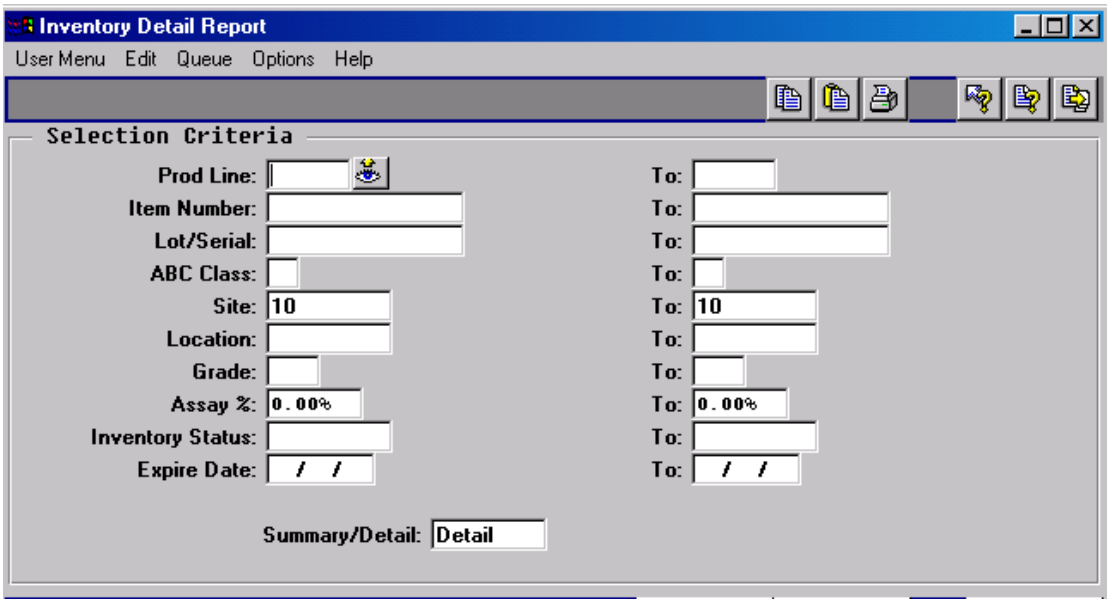
The records with the zero balances are gone.

11 Check Inventory Detail by Item Inquiry 3.2 for item 09-0005.

This will show you where all 09-0005 is located, its status, and expire date.

12 Become familiar with the Inventory Detail Report 3.6.5. This report has a large range of selection criteria. This allows it to be tailored for many uses.

As an example from the last exercise, you can sort by status code, so you could always find all items with the status “Safe Stk.” You can find all occurrences of a given lot number a or range of lot numbers. Find items by their expiration date or grade code etc. You can also get summary or detail information.



Run this report for all inventory at site 10 first in summary format then in detail format and note the differences.

Demand (1 of 3)

- Requirements
  - Total demand seen by the system
- Allocations
  - Reservations of inventory to meet specific statements of demand
  - General allocations
    - Simple statement of need for an item
      - No detail as to which item
        - Like an airline ticket for a specific flight on a given date
  - Detail allocation
    - A specific item in inventory, by date, lot and or location
      - Like a boarding card for your flight with a specific seat

MS-IC-USE-120

Demand

Requirements vs Allocations

General Allocations

Detail Allocation

Demand (2 of 3)

- See demand in the system
  - Stock Availability Inquiry 3.17
    - Convenient overview by item
    - Quantity on hand, required, allocated and on order
  - Allocated Inventory Inquiry 3.18
    - Shows detail of which orders are consuming allocations
  - Master Schedule Summary Inquiry 22.18
    - Focus on sources of demand
    - Shows time buckets
    - Projections into future Master Schedule Detail Inquiry 22.21
    - Shows all transactions
      - Demand and supply, by date, with projections

MS-IC-USE-130

Viewing Demand in the System

Demand (3 of 3)

- MRP Summary and Detail Inquiries
  - 23.13 and 23.16 focus on supply
- Sales Order Control File
  - Affects allocations
    - Quantity available to allocate
    - Allocate days (zero turns off allocations)
    - Limit allocations
    - Detail allocations
    - Pick only allocated lines
    - Shipping lead time

MS-IC-USE-140

MRP Summary and Detail Inquiries

Sales Order Control File

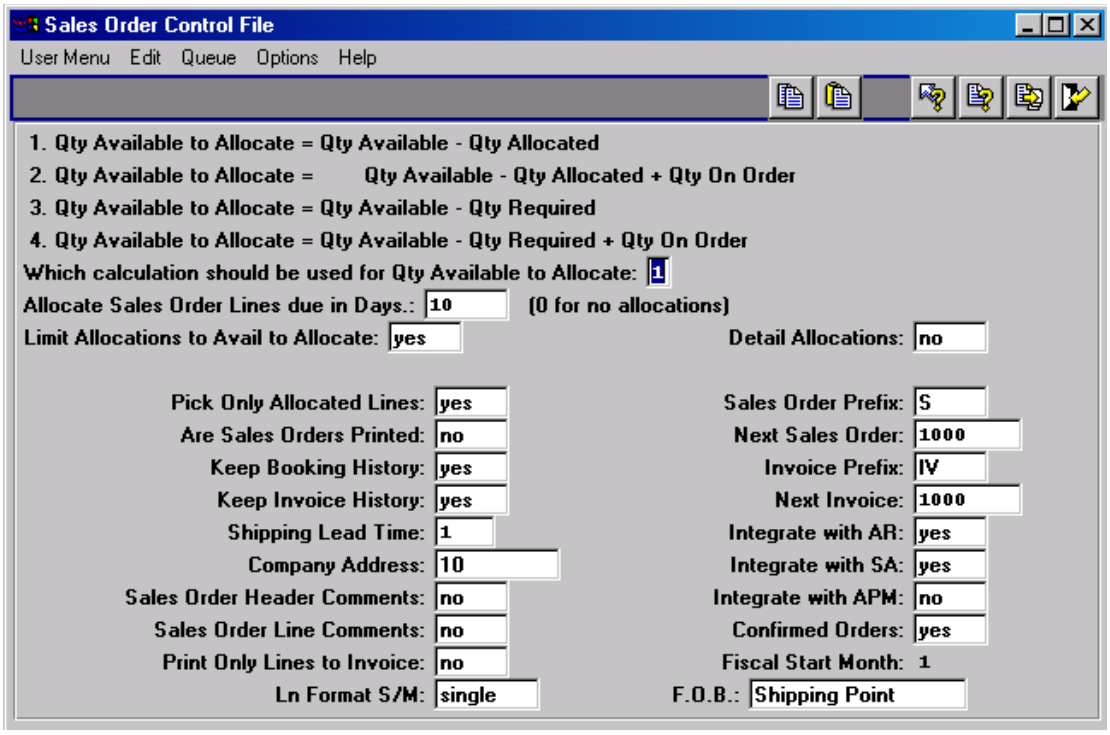
Processing Activities

Sales Order Control File 7.1.24

1 Set the following:

Quantity available to Allocate:	1
Allocate Sales Order Lines due in Days:	10 Note: 0 turns off allocations)
Limit Allocations to Avail. To Allocate:	Yes
Detail Allocations:	No
Pick Only Allocated Lines:	Yes
Shipping Lead Time:	1
Company Address:	10
Sales Order Prefix:	S
Next Sales Order:	1000
Invoice Prefix:	IV
Next Invoice Number:	1000
Confirmed Orders:	Yes

Your Sales Order Control File (frame one) should now look like this:



Set up Demand Data

1 Use Work Order Maintenance 16.1 to create a work order for item 02-2000, type <blank>, site10.

a Make the work order for a quantity of 240.

b Type a question mark in the release date field.

c Make the due date the last day of the month after next. (Use the calendar widget).

d Set Status to E (Exploded). Press the Go key through the following screens.

2 Check Stock Availability Inquiry 3.17 for the item 02-2000.

You should see the quantity on order.

3 Check Stock Availability Inquiry for any component of the 02-2000 (09-0010).

You should see a requirement for the component. If you check Allocated Inventory Inquiry 3.18 for that component, you will see that the requirement has not been allocated.

4 Create another work order for the 02-2000 for a quantity of 240.

5 Let the due date default and set the Status to R (Released).

This will cause components to be allocated.

6 Check field help for Status to see the effects of the other status codes.

7 Check Stock Availability Inquiry again for the component 09-0010.

You should see requirements for two sets of components and an allocation for another set of components.

If you check Allocated Inventory Inquiry 3.18, you will see the work order that is creating the allocations.

Create Sales Order Demand

1 Use Customer Maintenance 2.1.1 for customer 1001000, Century Hallmark, default to site 10, and increase credit limit to $1,000,000.00, and remove the freight list (or add the freight list to Site 10 using Freight List Maintenance 2.20.1).

2 Use Sales Order Maintenance 7.1.1 to create a sales order, due in three weeks, for 100 each of item 02-2000. (Use calendar widget.)

3 Create a sales order, due in one week, for 100 each of item 02-2000.

4 Check the Stock Availability Inquiry and Allocated Inventory Inquiry.

You see the requirements but no allocations. Why?

Allocations have been limited to Available to Allocate and there is no inventory.

Work Order Allocations

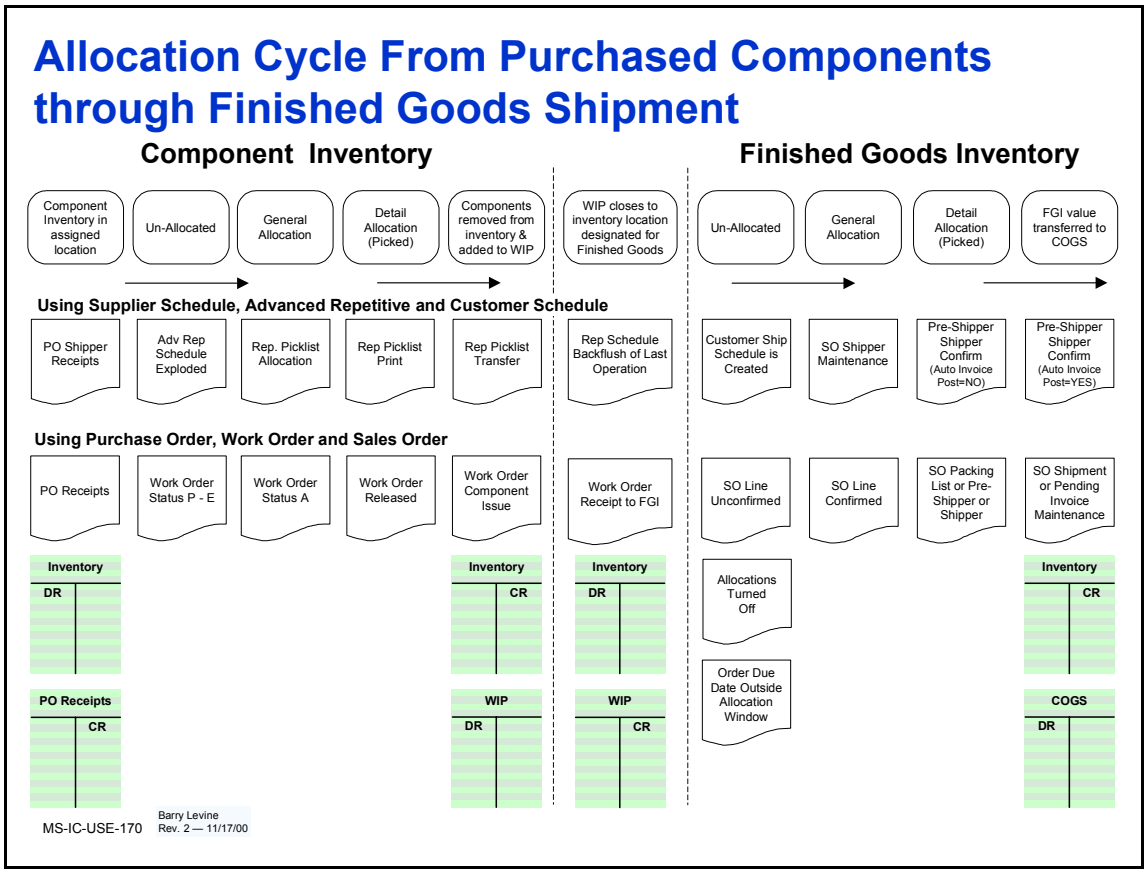
- Managed by system logic
  - Based on work order (WO) status

Work Order Status	
P, F, and E	Not allocated
A	General allocation
R	Detail allocation

    - Allocation status = picked
  - WO component issue transaction
    - Changes allocation status from picked to issued

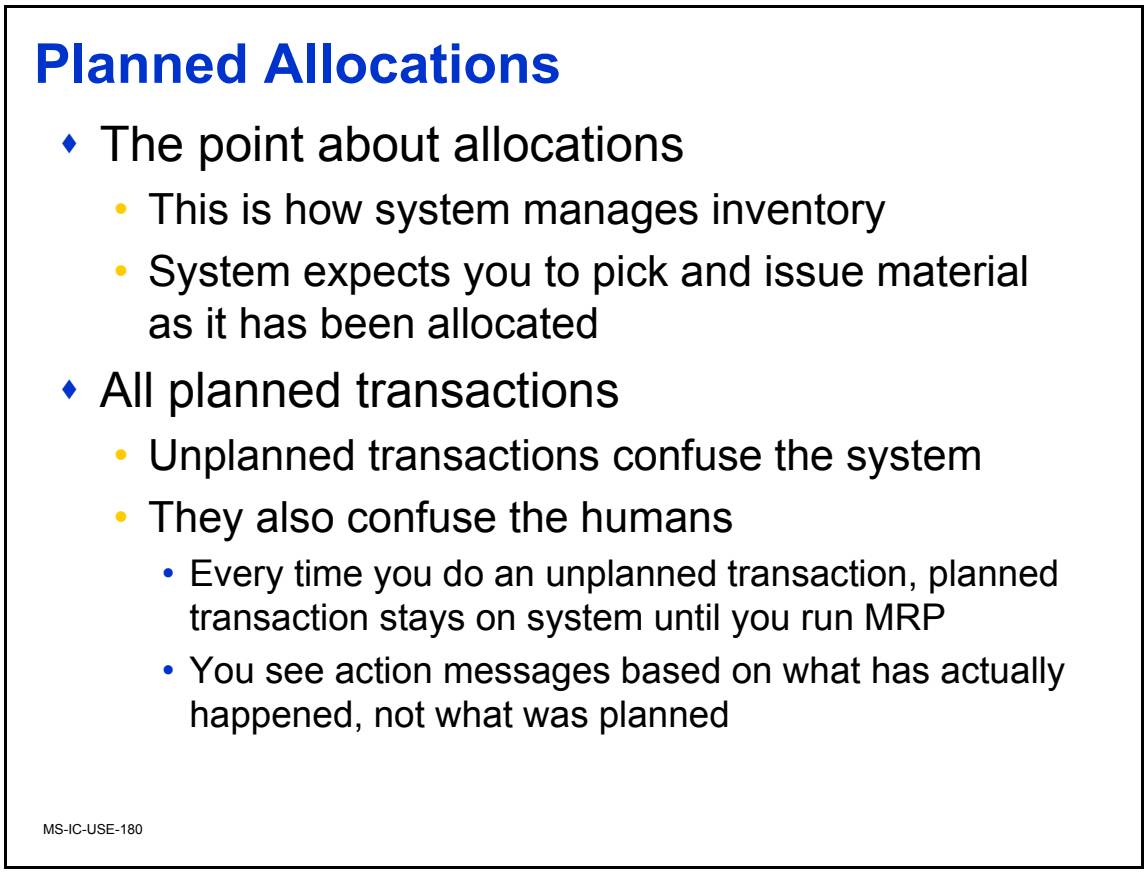
MS-IC-USE-160

Work Order Allocations



Allocation Cycle

See a close-up of this diagram in Appendix C, *Component Inventory on page 212* and Appendix C, *Finished Goods Inventory on page 213*.



Planned Allocations

Processing Activities

Process Work Orders

1 Find the work order number for item 02-2000 that is due soonest. Use Work Order Inquiry 16.2 if necessary.

This should be a work order for 240 each of item 02-2000 Gold Pen & Pencil Set.

2 Using Work Order Component Check 16.5, check on-hand stock of components. Set Short Only to No.

You should have plenty of stock on hand.

3 If you wanted to check stock for an item for which you did not have a work order, use Simulated Picklist Item Check 13.8.17.

Please note this inquiry does not check allocations.

4 Using Work Order Bill Maintenance 16.13.1, check allocations for your work order.

a Enter your order number.

b With the cursor on the component field, use the up and down arrows to scroll through your components.

Note that with status Released, your components are allocated, but not picked or issued.

Note also that these are detail allocations by location.

You should see that the Gold Electro-Plate is allocated from location 110 and the other components from location 100.

c If you check your exploded order, you will see it has no allocations.

5 Using Work Order Release/Print 16.6, print a picklist for your work order to the Window.

You will see the detailed picklist as it would be printed to paper.

6 Check Work Order Bill Maintenance again and see that the allocations for the components are now shown as picked.

7 Use Work Order Component Issue 16.10 to issue the components to the work order.

a Be sure to set the Issue Alloc = Yes.

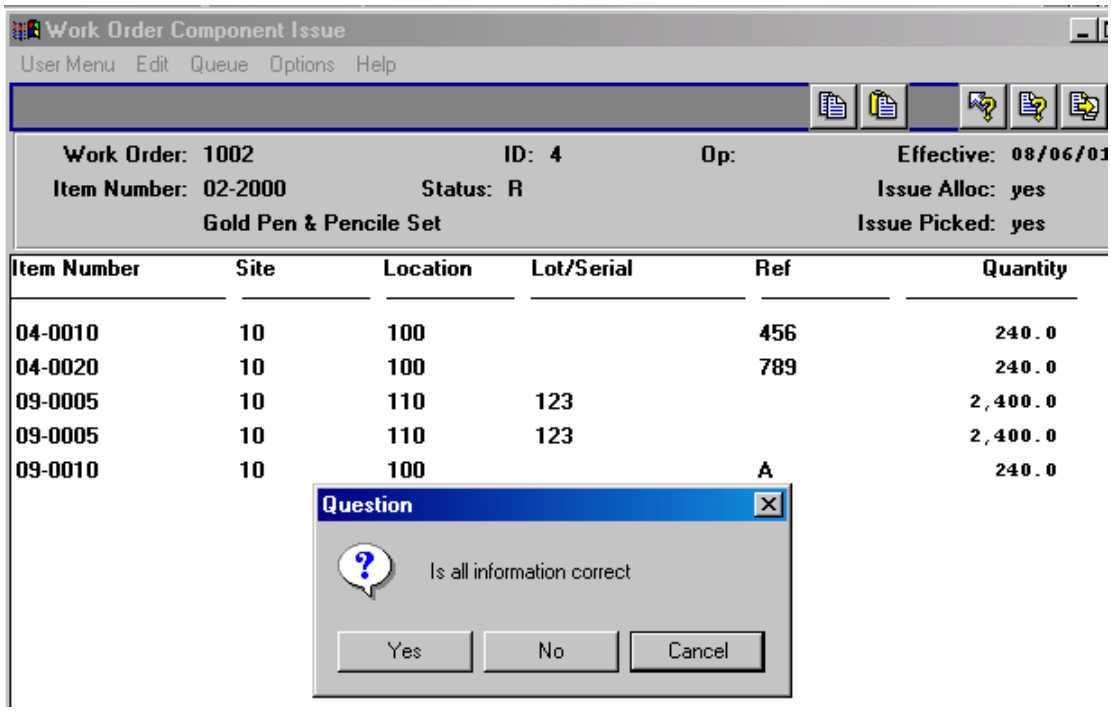
This sets up the issue screen to issue all components as allocated.

As the issue screen appears, you should see all of your required components with both the picked quantity and the issue quantity displayed.

b Pressing the Go key will bring up a message: Display items being issued? Answer Yes.

8 Review the data displayed and respond to the question: Is all information correct? If it is not, respond No, which will return you to the transaction Window to make corrections.

Your screen should look like this:



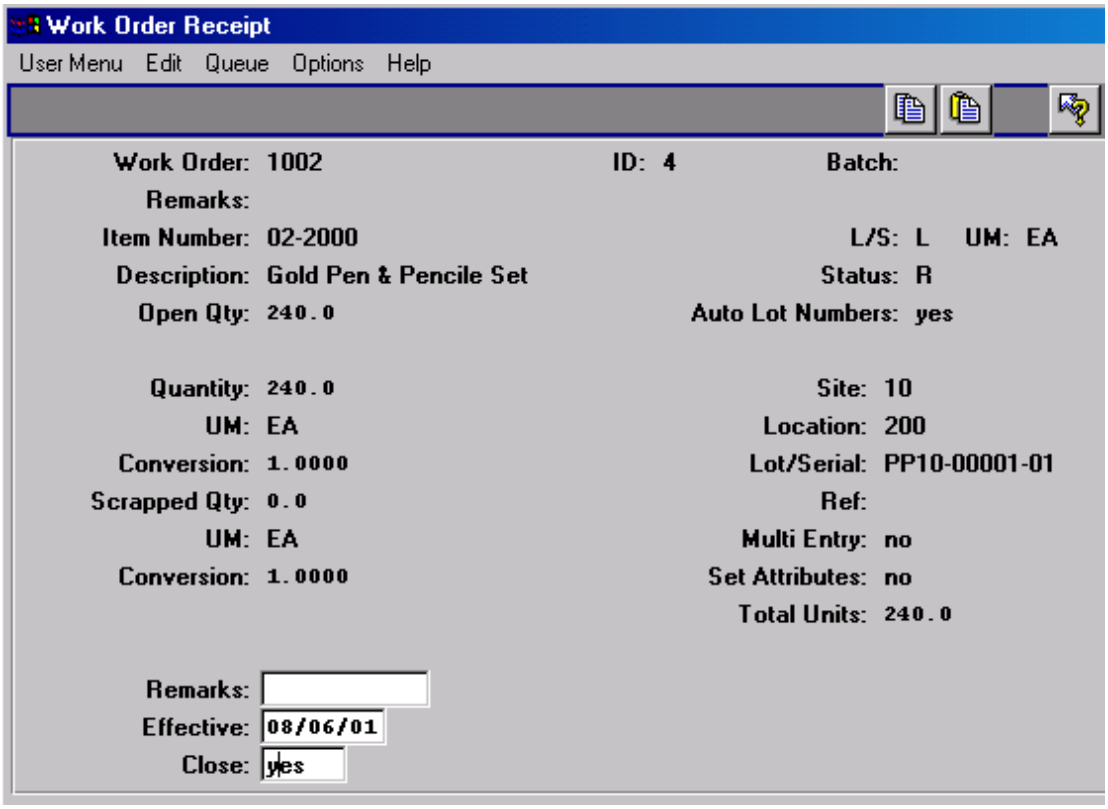
Work Order Bill Maintenance will now show the components as issued. This screen can be used to modify allocations, and add or delete items from the work order bill of material.

9 Using Work Order Receipt 16.11, close the work order.

a Close the order for 240 each.

Note that the screen pre-fills with the site and location 200 (from the item master data file) and has assigned a lot number based on the information set up in the compliance module (Lot Group Maintenance).

b Set the Close Order flag = Yes.



10 Use Inventory Detail by Site Inquiry to verify your stock and status on hand.

11 Check Stock Availability Inquiry to see how this data has been updated.

Note the receipt of the items required has not allocated them.

12 Using Sales Order Auto Allocations 7.1.7, allocate the sales order that is due in one week.

a Run this transaction for the one sales order. The default 10 days into the future should work.

b Check Stock Availability Inquiry to see that 100 units are now allocated. Allocated Inventory Inquiry will show which specific order the allocation is for.

Note, however, that this is a general allocation – that is, no lot/location is defined.

c You can see the detail allocation by running Sales Order Packing List 7.9.13.

If you run this transaction for your sales order with the Update = No and send the output to your Window, you will see a simulation of the detail allocation that would have been created.

d Run this transaction again with the Update = Yes.

The allocation status is changed to Picked which you can now see in Allocated Inventory Inquiry, along with the detail for the allocation by lot and location.

e You could have done a manual detail allocation using Sales Order Manual Allocations 7.1.6.

f At any time you can also check the details of sales order allocations, pick and ship status using sales order line item detail in Sales Order Maintenance 7.1.1.

13 Use Sales Order Shipments 7.9.15 to ship the sales order.

a Select your sales order and set the Ship Allocated flag = Yes.

Note that the order is ready to go.

b Pressing the Go key brings up the question: Display items being shipped? Respond Yes if all the data is correct. Then press the Go key through the Sales Order trailer to complete the transaction.

14 Check Stock Availability Inquiry and Allocated Inventory Inquiry to see how they have been updated.

15 Check Lot Where-Used Inquiry 3.22.4 for your lot number or part number.

This will show the receipt of the work order and the shipment of the sales order.

16 Using Work Order Release/Print 16.6 to process another work order.

a Use your status E (Exploded) order due at the end of next month. Use Work Order Inquiry 16.2 if needed.

b Release and print this order to your Window. Be sure you see the picklist with lot numbers. (Note: You are short 600 ML of 09-0005.)

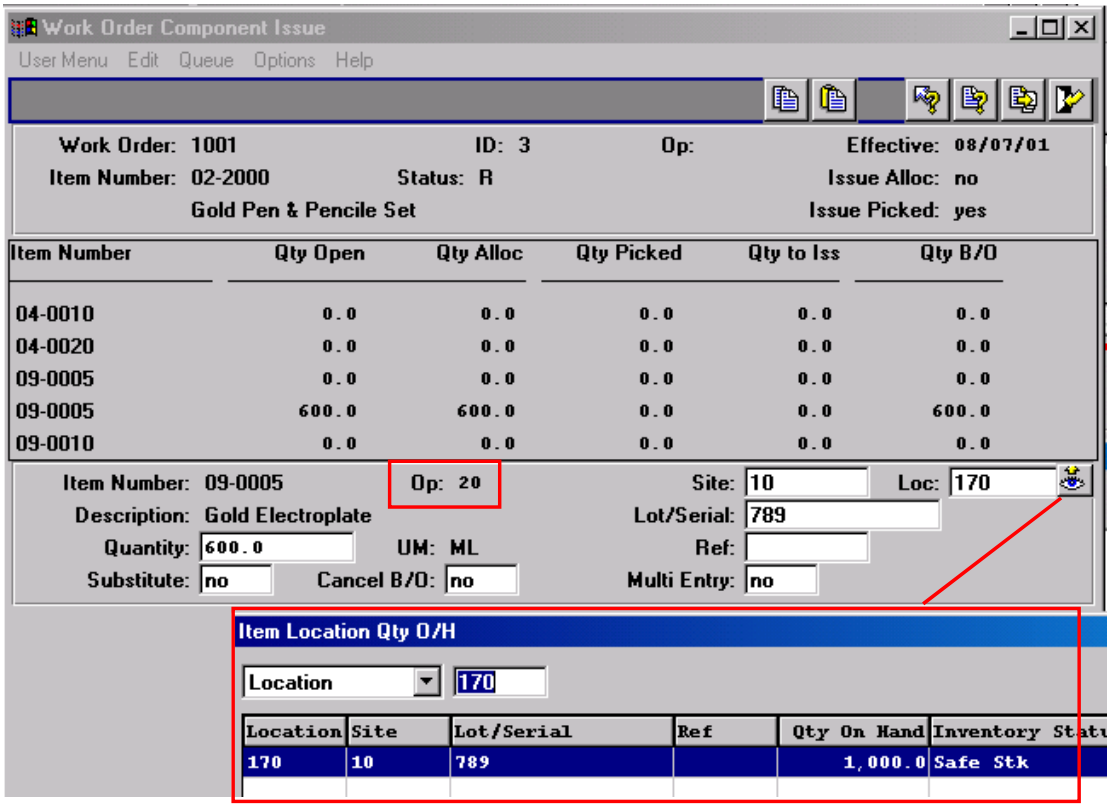
17 Use Work Order Component Issue 16.10 to issue the components. Set “Issue Alloc:” to Yes. Accept defaults and press Go to complete the transaction.

Note the back order.

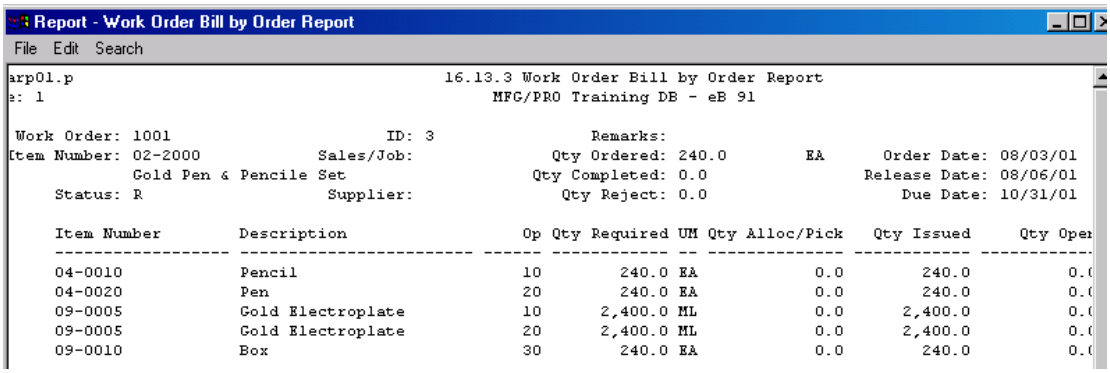
a Use Work Order Bill Shortage Inquiry 16.15 to see the back ordered 600 ML of 09-0005. This inquiry keeps track of all work orders issued short.

b We are short 600 ML of the 09-0005, this is what safety stock is for. We could transfer the safety stock from its location to the normal stores location using Transfer - Single Item 3.4.1, or we can issue it to the work order directly from the safety stock location.

c Use Work Order Component Issue 16.10 to issue the additional 600 ML of 09-0005 to your work order. You can use the look up icon on the location field to find the location and lot number. Be careful to issue to operation 20 component, as operation 10 has been issued complete.



d Check Work Order Bill by Order Report 16.13.3 to see that your component issues are complete and correct.



18 Use Work Order Receipt 16.11 to receive the order.

a Select Multi Entry and receive 100 units into the default location 200.

b Put the other 140 units into the annex location 220.

c Close the order.

19 We are now very short of 09-0005.

a Create a purchase order to buy a case of 24 one-liter bottles.

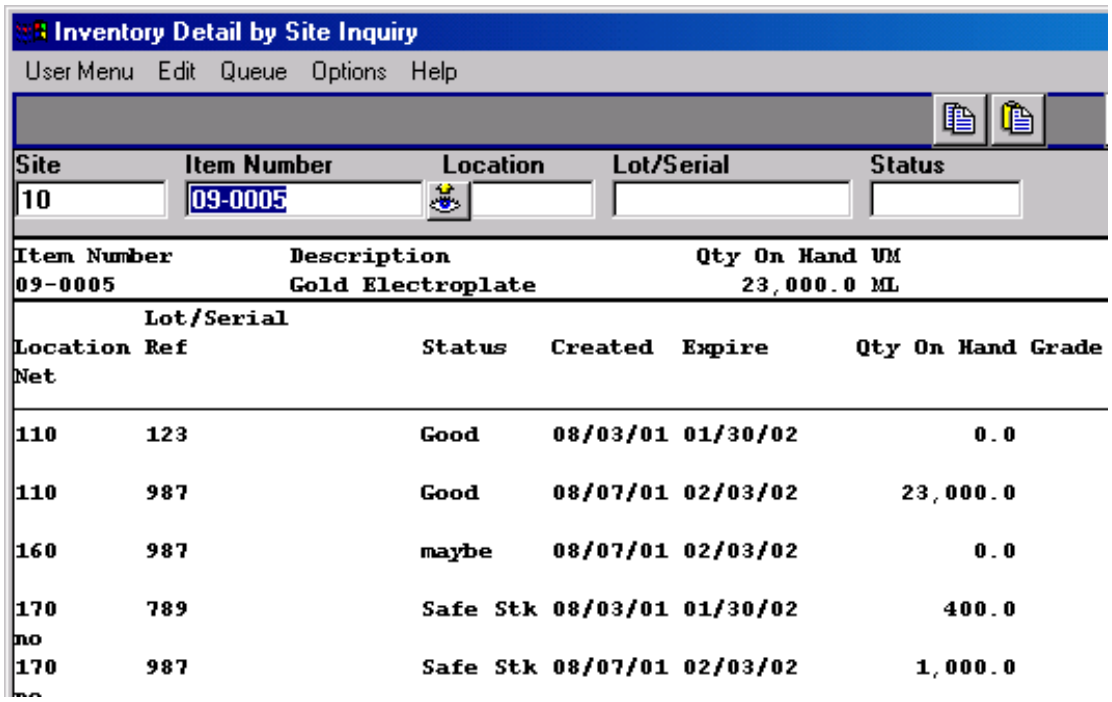
You may ignore the warnings about the unit of measure; just be sure when you type "CS" in the unit of measure field, you see the conversion factor of 24,000.

b Receive the PO complete for lot number 987.

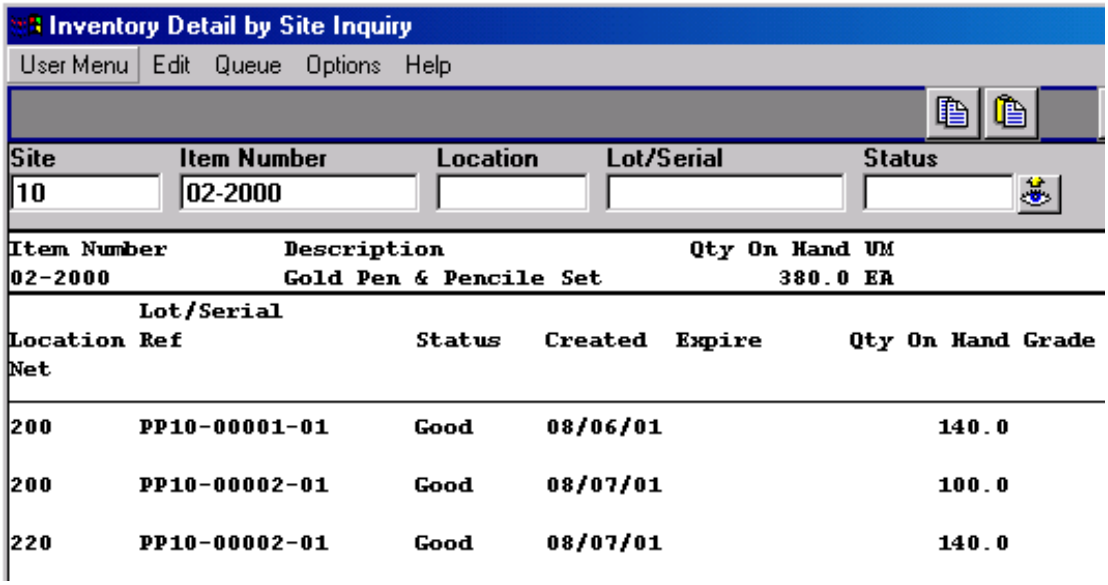
c Use Transfer - Single Item 3.4.1 to move 23,000 ML of 09-0005 from the inspection location 160 to the stores safe 110.

d Move 1,000 ML to the safety stock location 170.

e Use Inventory Detail by Site Inquiry 3.3 to check current status of 09-0005.



20 Check Inventory Detail by Site Inquiry 3.3 for your 02-2000 to see its current inventory status.



Cycle Counting (1 of 5)

- Key to high levels of inventory accuracy
- Features of successful cycle count program
  - Everything is counted
  - Use ABC for control of the “A” items first
    - Then “B”s and “C”s
      - Beware the sum of the “C”s phenomena
  - Define areas and responsibilities
    - Count some items every day
    - Every person counts something
    - Count by MFG/PRO inventory detail
      - Site, location, item, lot, reference

MS-IC-USE-200

Cycle Counting

Key to Accuracy

Features of Successful Cycle Count Program

Cycle Counting (2 of 5)

- Define policy with goals
  - Primary goal is to discover source of errors and remove them
- Use system capabilities
  - Run reports, analyze data
  - Set tight tolerances for all items
  - Let system set ABC class
  - Run reports by gross margin
  - Stick to schedule
    - Review every discrepancy and explain it
- Get the “A”s first – but keep going

MS-IC-USE-210

Define a Policy and Goals

Use System Capabilities

Cycle Counting (3 of 5)

- Common problems
  - Folks can't count, don't have right equipment
    - Bar code, counting scales, weight scales, counters, flow meters
    - Accept wrong counts from vendors, production departments, or the last person who counted
    - Fitted containers, cases, egg crates
    - Purchasing focused on bulk buys, not convenient containers
      - Labeling was not part of purchase specification
      - Labeling not required of Production

MS-IC-USE-220

Common Problems

Cycle Counting (4 of 5)

- Common problems
  - Folks can't recognize things
    - Too many similar items or containers
    - Lack of proper labeling
      - Every package requires a label
      - Re-label everything decanted or re-packaged
    - Lack of familiarity with materials
      - Teach folks what the stuff is, what it's used for, and why it's important – this is empowerment
      - This is also required for hazardous material

MS-IC-USE-230

Cycle Counting (5 of 5)

- Common problems
  - Folks can't find things
    - Lack of:
      - Organization
      - Proper storage facilities
    - Unauthorized access or movement
    - Too much junk in the way (old, scrap, reject, excess)
    - Co-mingled inventories
      - R&D stuff mixed in with production material
  - Folks don't take time to fix problems at source
    - Can't get support to fix problems

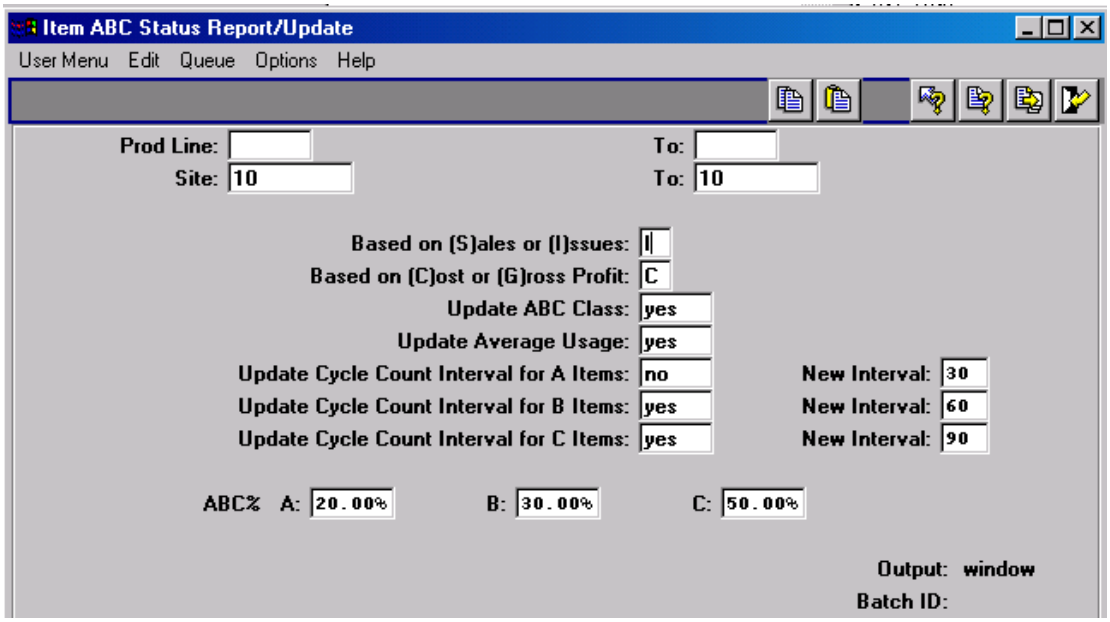
MS-IC-USE-240

Processing Activities

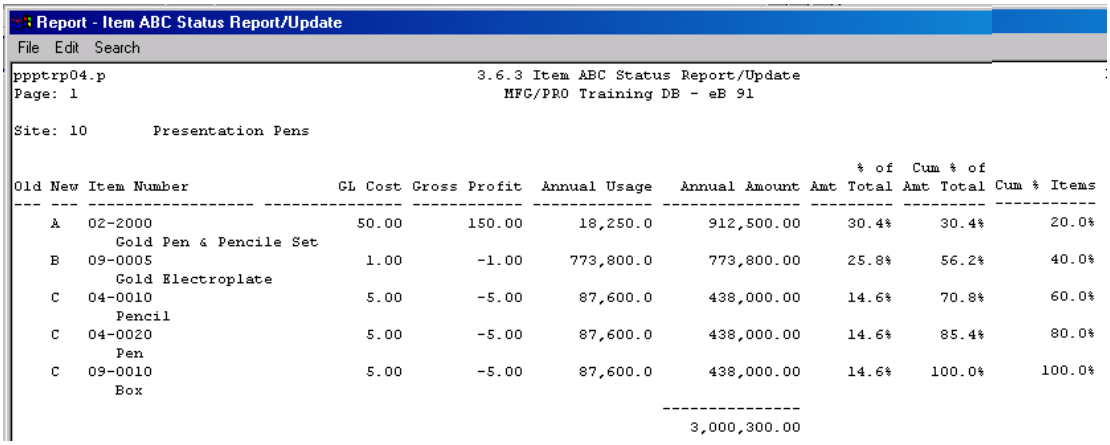
Cycle Count Process

Instructions: Begin the cycle count process by establishing ABC classifications for your items. This can be done manually, but you now have some data in your system, so use that.

1 Use the Item ABC Status Update Report 3.6.3 (also at 1.5.9) for site 10. Set the screen selections as shown below:



Your report should look like this:



Report - Item ABC Status Report/Update

File Edit Search

```
pptrp04.p                                  3.6.3 Item ABC Status Report/Update
Page: 1                                       MFG/PRO Training DB - eB 91

Site: 10       Presentation Pens

                                                                                                  % of  Cum % of
Old New Item Number                GL Cost Gross Profit  Annual Usage   Annual Amount Amt Total Amt Total Cum % Items
--- --- ------------------ ---------- ------------ ------------- --------------- --------- --------- -----------
    A   02-2000                  50.00       150.00      18,250.0      912,500.00     30.4%     30.4%       20.0%
          Gold Pen & Pencile Set
    B   09-0005                   1.00        -1.00     773,800.0      773,800.00     25.8%     56.2%       40.0%
          Gold Electroplate
    C   04-0010                   5.00        -5.00      87,600.0      438,000.00     14.6%     70.8%       60.0%
          Pencil
    C   04-0020                   5.00        -5.00      87,600.0      438,000.00     14.6%     85.4%       80.0%
          Pen
    C   09-0010                   5.00        -5.00      87,600.0      438,000.00     14.6%    100.0%      100.0%
          Box
                                                                     ---------------
                                                                       3,000,300.00
```

a Run this report again with the (S)ales or (I)ssues flag set to "S."

This is a classic distribution. The negative gross margin for the components is because we did not give them a price in the item master cost screen in Item Cost Maintenance 1.4.9.

2 Use Item Cost Maintenance to add a price to the pen and pencil as if we anticipated selling them as individual replacement items.

a Make the price $15.00 for each item, 04-0010 and 04-0020.

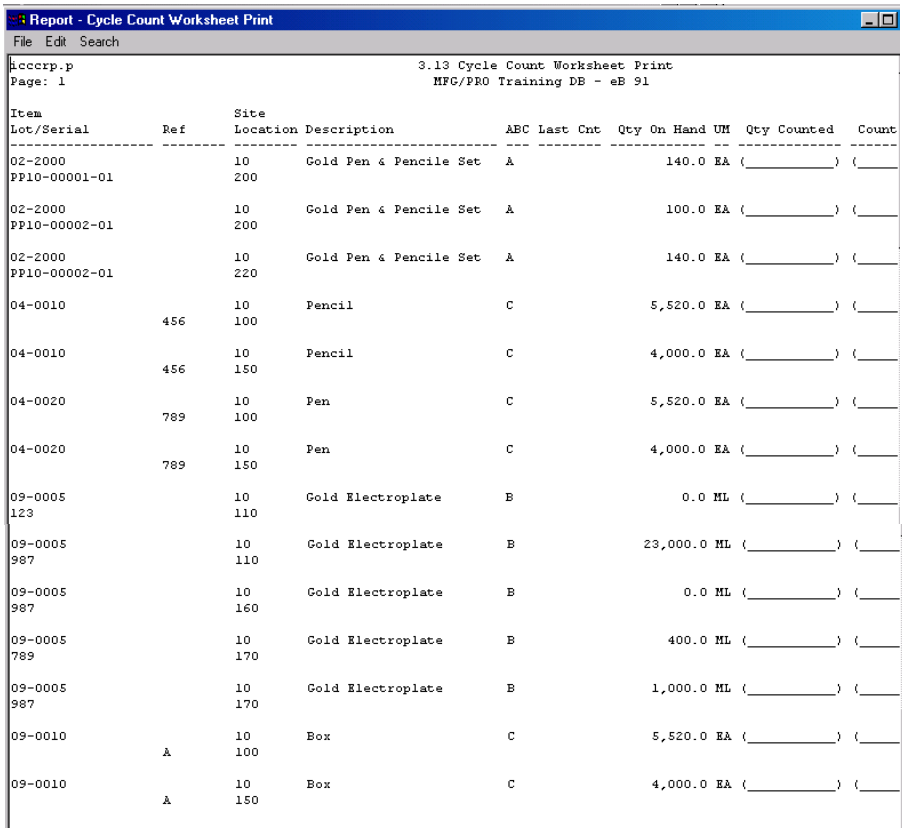
3 Run Cycle Count Worksheet Print 3.13 for Site 10.

4 Set the Print Quantity On Hand and the Include Zero Quantity = Yes.

a All other fields may be left at default.

b If you have a printer available in the classroom, this is a good time to use it. Otherwise, run your output to the Window, and make note of your quantities and locations.

Your report should look something like this:



Report - Cycle Count Worksheet Print

File Edit Search

icccrp.p 3.13 Cycle Count Worksheet Print
Page: 1 MFG/PRO Training DB - eB 91

Item Lot/Serial	Ref	Site Location	Description	ABC	Last Cnt	Qty On Hand	UM	Qty Counted	Count
02-2000 PP10-00001-01		10 200	Gold Pen & Pencile Set	A		140.0	EA	(_____)	(_____
02-2000 PP10-00002-01		10 200	Gold Pen & Pencile Set	A		100.0	EA	(_____)	(_____
02-2000 PP10-00002-01		10 220	Gold Pen & Pencile Set	A		140.0	EA	(_____)	(_____
04-0010	456	10 100	Pencil	C		5,520.0	EA	(_____)	(_____
04-0010	456	10 150	Pencil	C		4,000.0	EA	(_____)	(_____
04-0020	789	10 100	Pen	C		5,520.0	EA	(_____)	(_____
04-0020	789	10 150	Pen	C		4,000.0	EA	(_____)	(_____
09-0005 123		10 110	Gold Electroplate	B		0.0	ML	(_____)	(_____
09-0005 987		10 110	Gold Electroplate	B		23,000.0	ML	(_____)	(_____
09-0005 987		10 160	Gold Electroplate	B		0.0	ML	(_____)	(_____
09-0005 789		10 170	Gold Electroplate	B		400.0	ML	(_____)	(_____
09-0005 987		10 170	Gold Electroplate	B		1,000.0	ML	(_____)	(_____
09-0010	A	10 100	Box	C		5,520.0	EA	(_____)	(_____
09-0010	A	10 150	Box	C		4,000.0	EA	(_____)	(_____

Note This report was sorted by item, by lot, then by site, by location. If we had run the report sorted by site, the items would be in site – location sequence, then by item, by lot. Note also that the system captures this data whether you print it or not.

Cycle Count Feedback

1. Use Cycle Count Feedback 3.14 to cycle count your inventory.

   Note the initial/recount flag as you enter the screen. Use initial.

   Also note the cost and quantity data presented on this screen. You can find the lot numbers from the look-up icon on the lot number field. Cycle count the correct quantity until you get to the 09-0005, Gold Electro-Plate.

   If you get an out-of-tolerance warning, check your location code and lot/reference number. The system requires an exact match.

   For the 09-0005 in location 170 safety stock, the 400 ML represents a little less than half a bottle. Assume we cannot find this and count zero for this lot, location.

2. Finish cycle counting your materials.

3. Run the Cycle Count Results Report 3.15 and send the output to your Window.

   Note that the variance in the 09-0005 Gold Electro-Plate is 100% to quantity on hand but only 0.05% to annual usage.

   Note that the quantity on hand was not updated.

   Our cycle count has shown the difficulty of maintaining inventory of items stocked in bulk rather than the unit it is consumed in. The decision is made to make the work center the primary stock location for 09-0005 Gold Electro-Plate.

   a. First use Cycle Count Results Entry 3.14 to “recount” the 09-0005 lot 789 in location 170 to zero.

   b. Run Cycle Count Results Report again.

4. Use Location Maintenance 1.1.18 to set up a location equal to the work center.

5. For site 10, create location 10 with the Description Work Center 10 Stock location.

   a. Default status is Good.

   b. Type is Safe.

6. Use Item Inventory Data Maintenance 1.4.5 to change the default location for the 09-0005 to location 10.

   Note that the planning data will still receive the purchased material into the inspection location 160. When passed, it will then be transferred to location 10. As a safeguard we will still keep five liters in safety stock, location 170.

   a. Transfer 4,000 ML of 09-0005 from location 110 lot 987 to location 170.

7 Someone has found the 400 ML of 09-0005 in work center 10. Adjust location 10 inventory for 09-0005.

The hypothesis is that there are 400 ML of 09-0005 in work center 10, left over from the two work orders.

If we do a cycle count, we will get an inventory write up.

If we do an unplanned receipt, we create the impression that the material just materialized from nowhere.

The correct response requires that we think through the effects of the transactions.

In this case, it appears that while the work order component issue was for the exact quantity required, stores issued a full bottle. Stores then did a cycle count write down of the material they had on hand in safety stock.

So, in this case the correct transaction is a cycle count adjustment in location 10 which will create a write up in value that offsets the currency value of the previous transaction, with the material now in the correct location.

a Use Cycle Count Results Entry 3.14 to do a cycle count adjust for 400 ML of 09-0005, in location 10.

b You may need to check your lot number using Inventory Detail by Site Inquiry.

This is lot 789 from the safety stock 170 location. You should get an out-of-tolerance warning as 400 ML is more than a 5% error from zero on hand.

c Do the transaction again as a Re-Count.

d If you use Cycle Count Results Report 3.15, you will see that both cycle counts were captured, but only the recount updated the on-hand balance.

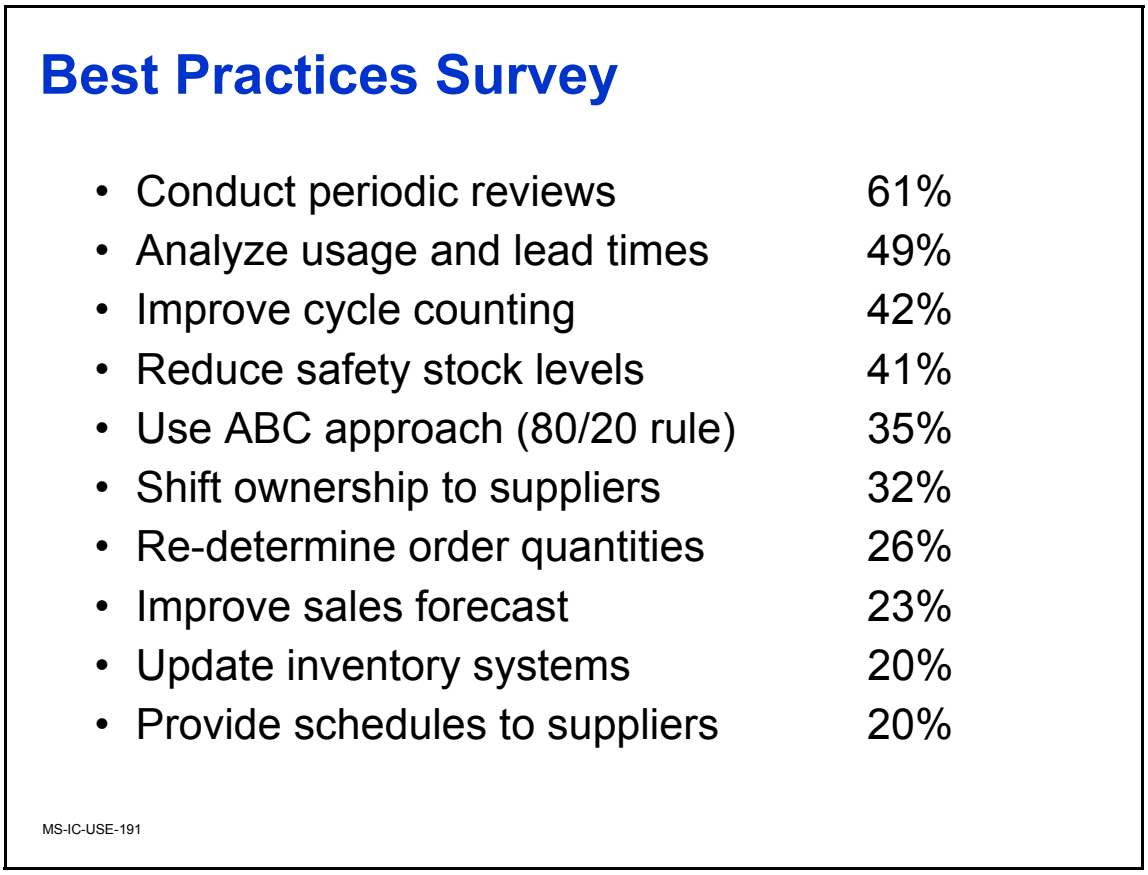
8 Check Inventory Detail by Site Inquiry for item 09-0005.

Is your inventory in all the right places?

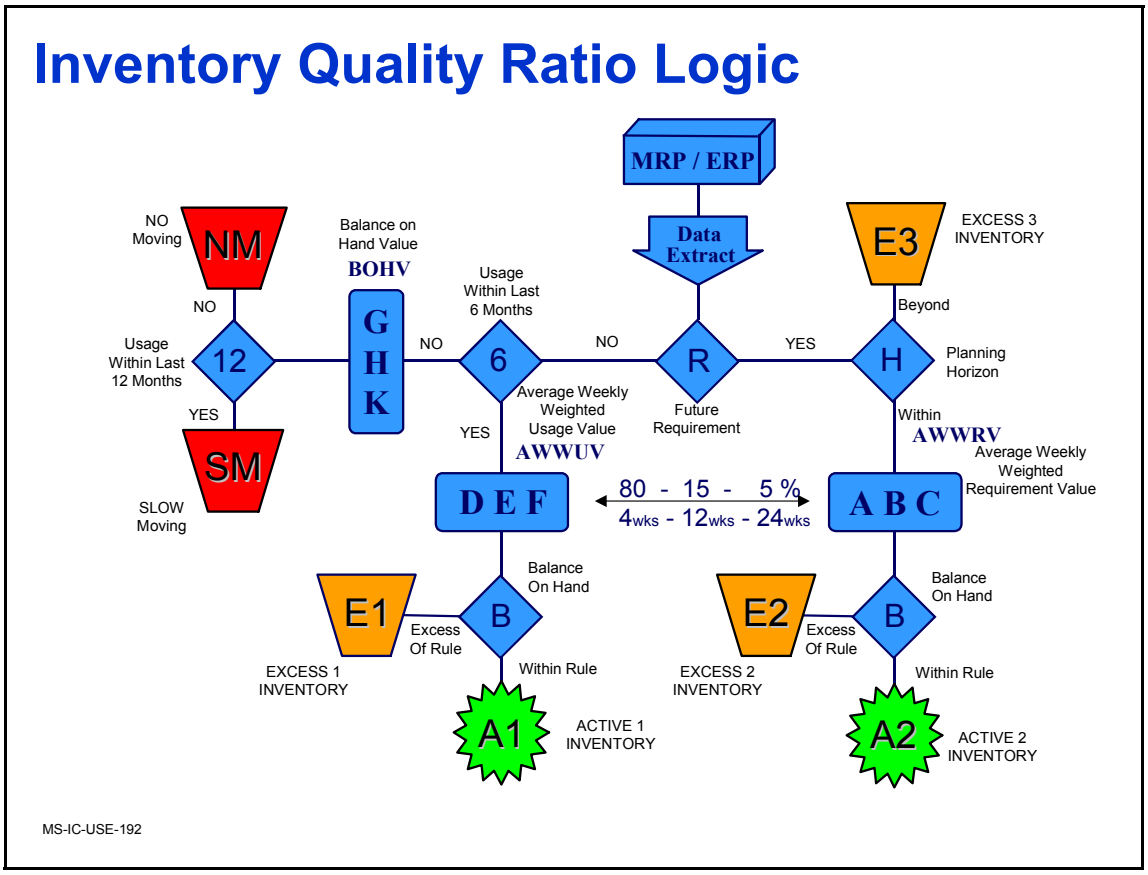
9 As location 10 is now the default for 09-0005, transfer the 19,000 ML in location 110 to location 10.

a Check Inventory Detail by Site Inquiry 3.3 for this item. You should have 5,000 ML in location 170 and 19,400 in location 10 of two different lots.

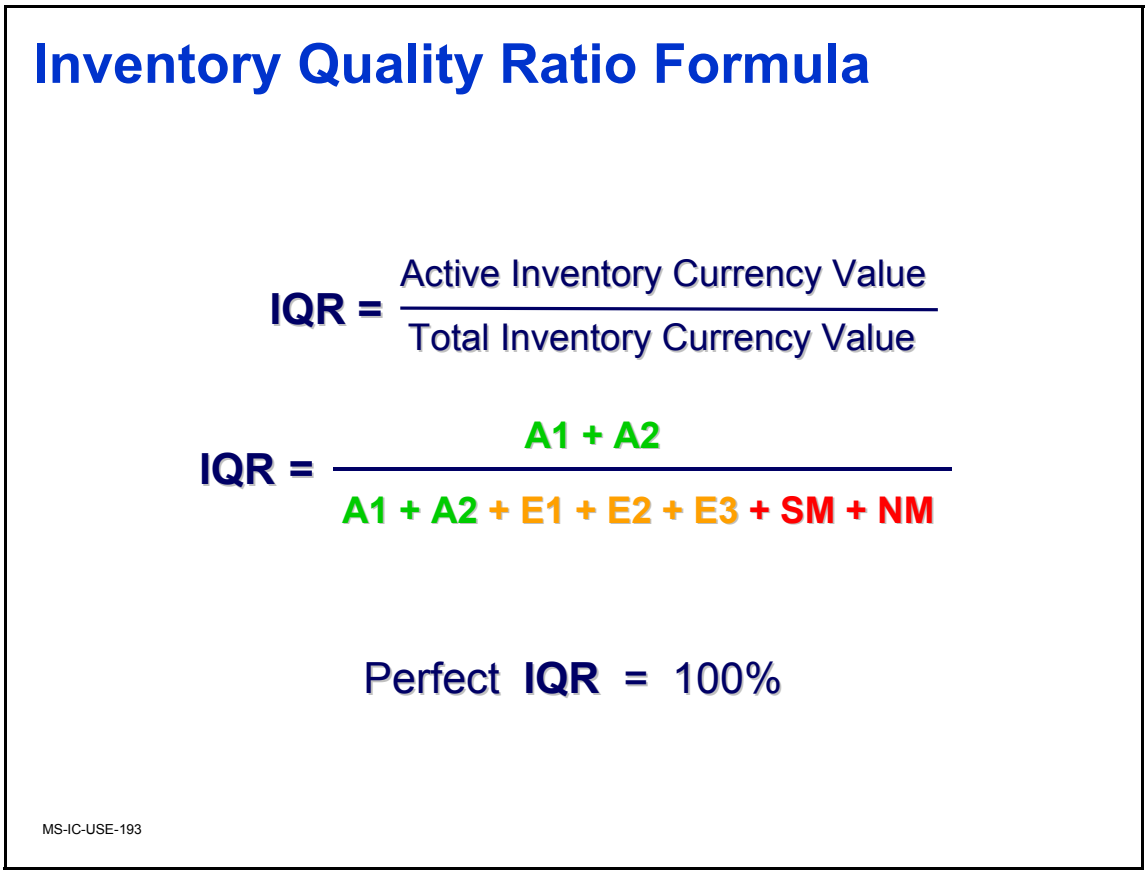
b Run Zero Balance Delete/Archive 3.23 with Delete = Yes and Archive = No.



Best Practices Survey



Inventory Quality Ratio (IQR) Logic



IQR Formula

Work in Process (1 of 2)

- Work in Process (WIP) is a special inventory class
  - Tracked by work order number
    - If full traceability and accounting is needed, implement WIP Lot Trace – 3.22
  - Adds lot/serial number for operations
  - Offers highest level of control

MS-IC-USE-250

Work in Process (WIP)

Work in Process (2 of 2)

- Don’t let WIP hide mistakes
  - Close work orders on time for the right quantity
    - Disposition non-conforming items
    - Return unused components to stores
  - Ensure work orders have due dates in the future
    - Close or cancel past due orders
  - Ensure work order issues are timely
    - If you use floor stock, ensure that it is handled correctly

MS-IC-USE-251

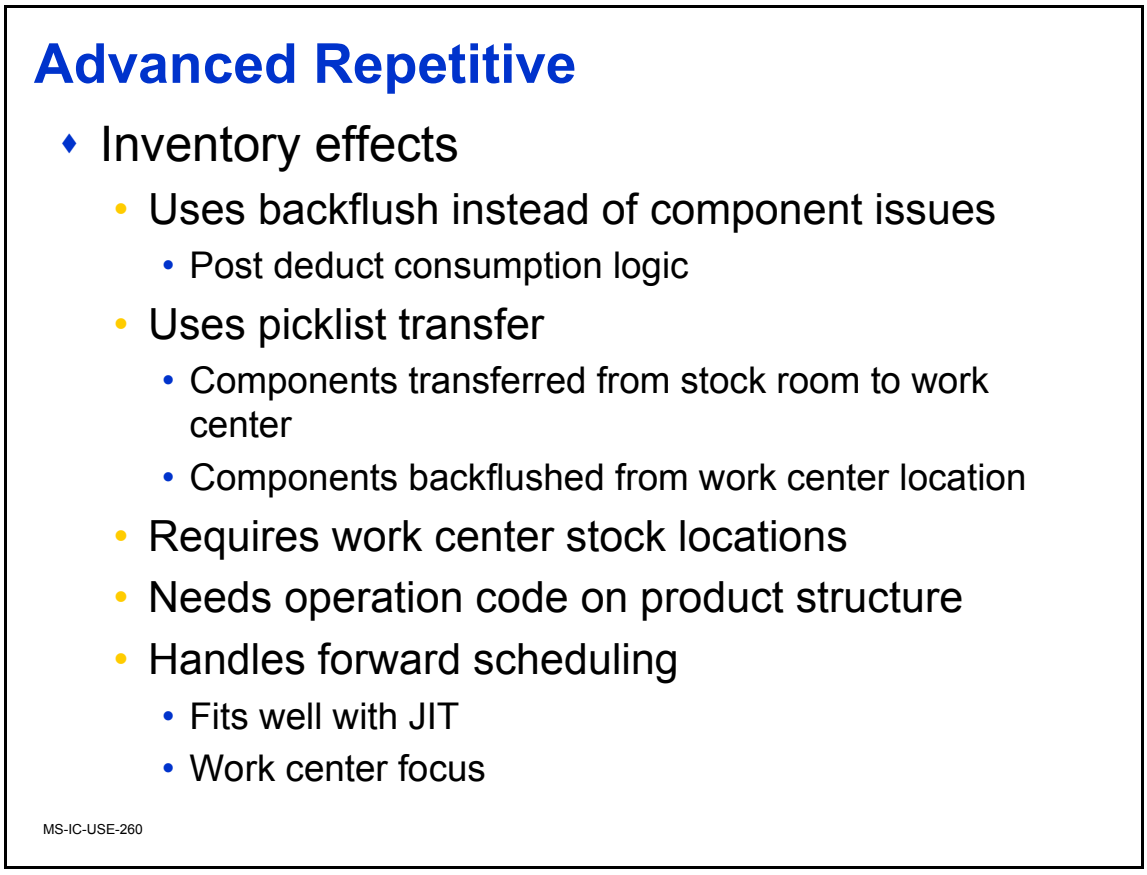
Don’t Let WIP Hide Mistakes

Just in Time (WIP)

- Just in Time requires, or often includes:
  - Work cell stock
    - Called point of use, or point of consumption
  - This requires work center stock locations
    - Transfers from main stockroom to work cell
    - Or, receive directly into work cell from supplier

MS-IC-USE-252

Just in Time



Advanced Repetitive

Sub-contract WIP (1 of 2)
Advanced Repetitive

- Sub-contract operations
  - Set up work center for each sub-contractor
    - Equal to vendor number (2.3.1 = 14.5)
  - Define operations in route 14.13.1
    - Optionally create WIP item codes and costs
      - Unique to route operation
  - Use sub-contract POs
    - Create supplier schedule
    - Link PO line item to the route
  - Use repetitive sub-shipper to move WIP to sub-contractor
    - Month-end WIP now tracked and costed automatically
    - PO shipper receipt or PO receipt to receive back into WIP

MS-IC-USE-270

Sub-contract WIP

With Advanced Repetitive

Sub-contract WIP (2 of 2)
Without Advanced Repetitive

- Use same setup
  - Sub-contract POs linked to WO operation
  - Find another way to ship
    - Manual shipper
    - SFC tracks WIP to sub-contract operation
    - Month-end WIP work order operation cost
  - PO receipt places material back into WIP at next operation
  - If you must see inventory at sub-contractor
    - Set up WIP item with zero cost
    - Use unplanned receipts and issues to sub-contractor location

MS-IC-USE-280

Without Advanced Repetitive

Reprocess Material

- Regrind plastic, end cut metal, or wood
  - Assign item code, plastic reject
  - Assign item code for regrind material
    - Plastic regrind
  - Collect reject material in work center location
    - Unplanned receipt or by-product receipt
  - Issue reject material to regrind route
    - Work order that regrinds the material (plastic reject)
      - Into the item “plastic regrind”
      - Closes to normal stores location or work center location
  - Issue regrind to new work order
    - BOM may call for both in allowed ratio
    - Regrind may be a substitution item
    - Works well with joint products

MS-IC-USE-290

Reprocess Material

Recycle Material

- Recycle items
  - Process scrap, metal chips, shavings, end cuts, etc.
  - Solvents and other process chemicals
  - Any direct material with salvage value
- Define in item master
  - 09-0005 bottle or 09-0010 scrap, for example
    - Assign unique type, group, and status codes
      - Unplanned receipt into work center location as created
      - When the bottle is empty, receive it into stock
    - When sufficient quantity is accumulated, send to recycle with unplanned issue
  - Co-by products allow some level of automation
  - Circular relationship not allowed

MS-IC-USE-300

Recycle Material

Consignment Inventory Receipts (1 of 4)

- Issues to be resolved
  - Receive material with or without PO?
  - No book value of material
    - We don't own it
  - Let MRP see material on hand
    - Don't want to order more
  - Issue material to work orders
  - Pay for material only when it's used
  - Reconciliation
    - What's been shipped to you
    - What you've paid for
    - What you still have

MS-IC-USE-310

Consignment Inventory Receipts

Issues to Resolve

Consignment Inventory Receipts (2 of 4)

- Workaround ideas 1
  - Simple approach
    - GL account code for consignment – type “Memo”
  - Set up inventory location for consigned stock
    - In production site
    - One per supplier and/or item
      - Location should be nettable for MRP planning
    - Receive items with unplanned receipt
    - When production consumes them, create AP voucher
      - Process payment
    - Need notification method
      - Wait for eB2

MS-IC-USE-320

Workaround Ideas – 1

Consignment Inventory Receipts (3 of 4)

- Workaround ideas 2
  - GL account code for consignment – type “Memo”
  - Set up inventory location for consigned stock
    - In production site
    - One per supplier and/or item
      - Location should be nettable for MRP planning
    - Use Inventory Account Maintenance 1.2.13 to assign memo account code to location
      - Allows costing without hitting balance sheet
  - Create PO line for each item
    - Payable terms long enough to allow consumption
  - Receive items using PO receipt
    - “Memo” account inventory location

MS-IC-USE-330

Workaround Ideas – 2

Consignment Inventory Receipts (4 of 4)

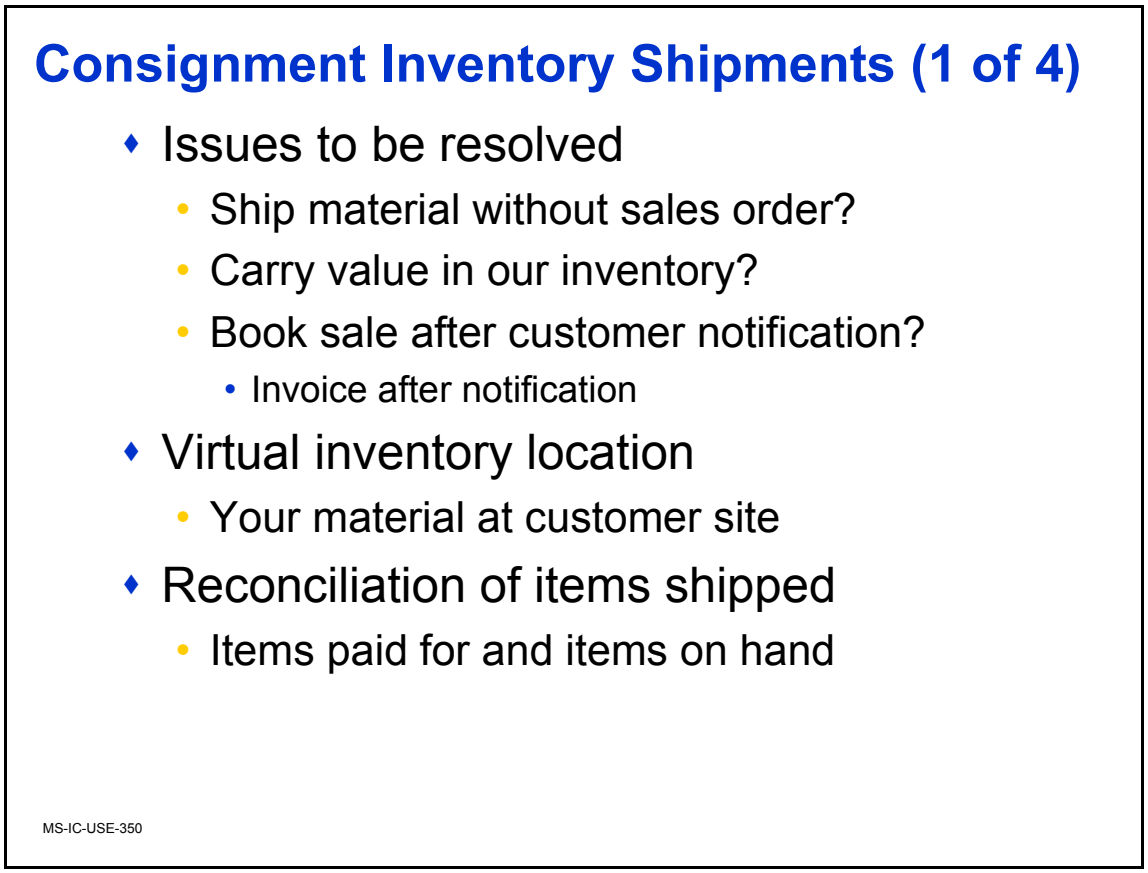
- Issue or backflush items as required by production
  - Create message document to AP
- Process voucher to pay supplier
  - Backed up by production issue document
  - PO line item detail
- PO receipt shows implied liability
  - Correct
    - Either pay for items or return them
  - Periodic reconciliation per agreement

MS-IC-USE-340

Issue or Backflush Items

Supplier Voucher

Purchase Order Receipt



Consignment Inventory Shipments

Issues to Resolve

Virtual Inventory Location

Reconciliation of Shipped Items

Consignment Inventory Shipments (2 of 4)

- Workaround ideas 1
  - Create “Memo” type inventory location
    - Per customer and/or per item?
  - Ship material to customer
    - Requires manual shipping documents
    - Transfer inventory to memo account location
  - Upon notification of consumption
    - Pending invoice maintenance for item and quantity
      - From correct inventory location
      - Books sale and sets up invoice
    - Periodic reconciliation per agreement

MS-IC-USE-360

Workaround Ideas – 1

Consignment Inventory Shipments (3 of 4)

- Workaround ideas 2 – as above, except
  - Set up sales quote
    - To ship from the “Memo” account location
      - With correct pricing, etc.
  - Upon notification of consumption
    - Release quote to sales order
      - Process shipment (from memo account location)
      - Process invoice

MS-IC-USE-370

Workaround Ideas – 2

Consignment Inventory Shipments (4 of 4)

- Workaround ideas 3
  - Set up consigned location as a DRP site
    - One per customer
    - Account codes, as appropriate
  - Allows placing demand as inter-site request
    - Not a sale
  - Ship using distribution order
    - Has shipping document
  - Upon notification, ship from distribution site
    - Use Sales Order Maintenance or
    - Pending Invoice Maintenance
      - Books sale
      - Allows invoicing

MS-IC-USE-380

Workaround Ideas – 3

Supply Chain Visualization
MFG/PRO eB internet tool

- Vendor managed inventory
- Your vendors have access to your inventory data for their items only
  - Allows vendors to see
    - Minimum and maximum inventory levels
    - Average usage
    - Suggested delivery
  - Allows vendors to send
    - Advanced shipping notice of goods shipped

MS-IC-USE-390

Supply Chain Visualization

Vendor Managed Inventory

MRO Items (1 of 2)

- Set up MRO items in unique product line
  - May also have unique type, group, status, and planner/buyer codes
- May use a unique range of item codes
- Set up unique inventory locations
  - May be “Expense” or “Asset” type accounts
    - “Asset” if items are expensive or remain in inventory a long time (could be called “pre-paid Expense”)
      - Allows full inventory and asset tracking
    - “Expense” with an unplanned issue when consumed
      - If expensed at purchase, be aware of value and timing
        - Still requires an unplanned issue to track quantity on hand

MS-IC-USE-400

Maintenance, Repair, and Operating (MRO) Supplies

Unique Product Line

Unique Item Codes

Unique Inventory Locations

MRO Items (2 of 2)

- When transferred from direct material stock
  - If you use direct material for some MRO activities
    - Set up accounts as previously described
    - Use inventory transfer transaction to move items from direct material stock location to MRO stock location
      - If MRO location is an “Expense” type account, items will be expensed as they transfer
      - If MRO location is pre-paid expense “Asset” type account, the value of the inventory moves to the new account

        Should be expensed when taken from MRO location by an unplanned issue. Check your account structure.

MS-IC-USE-410

Transfer from Direct Material Stock

Physical Inventory (1 of 4)

- If you have to do one, we have the system
  - Full tag supported
  - Inventory update may be either
    - Net change
      - Difference in count from frozen balance added to frozen
    - Overwrite
      - Replace frozen balance with count balance
  - Count can be taken while processing transactions
  - Can be used for a partial physical
    - Or, more formal cycle count

MS-IC-USE-420

Physical Inventory

Physical Inventory (2 of 4)

- The process
  - Tag delete and archive
  - Freeze balances
    - Implement appropriate physical controls
      - Shipping and receiving
  - Create and print tags
    - Creates a tag for each detailed inventory record
    - Sets up system for easy feedback of counted results
  - Create and print bulk tags
    - Some clients use all bulk tags

MS-IC-USE-430

The Process

Physical Inventory (3 of 4)

- The process (continued)
  - Count and enter tag counts
    - Reconcile out-of-tolerance counts and enter recount
    - Void unused or mutilated tags
  - Evaluate variance report
  - Update balances
  - Delete and archive tags
- To do an overwrite
  - Zero tag counts using 3.16.15
  - Count using all bulk tags
  - Not recommended with use of serial or lot control

MS-IC-USE-440

Doing an Overwrite

Physical Inventory (4 of 4)

- Hints for success
  - Get rid of excess, expired, obsolete, recycle, scrap, etc., before you start
  - In the weeks before the count
    - Minimize WIP and receipts
    - Maximize shipments
  - Cycle count everything you can
    - Tag and tape seal items in excess of a few weeks requirements
    - Use personnel who know the locations, procedures, and items

MS-IC-USE-450

Hints for Success

Processing Activities

Physical Inventory

1 Use Inventory Balance Freeze 3.16.4 to freeze balances for site 10.

2 Using Item Tag Create 3.16.1:

   a Set Include Zero Quantity and Negative Quantity to Yes.

   b Set Sort Option to 2.
   The system will display how many tags it has created.

3 Look at Bulk Tag Create 3.16.2. The system starts with the next tag number and inquires how many tags you want.

Note that most clients will want a break in the tag number sequence between the item tags and the bulk tags. Just change the starting number.

4 Using Tag Print 3.16.6, print to paper if a printer is available. Otherwise direct your output to the Window.

5 We'll use a shortcut here. It will be easier if you were able to print your tags. Use the Inventory Detail by Location Report 3.6.6 for site 10.

This should show your current on-hand balances in the same order as your tags. Run this report to your screen and just write down the counts. If you want to experiment with miscounts or variances, put in some incorrect data.

6 Use Tag Count Entry 3.16.11 to enter the tag number.

- **a** The system finds all the data except the count quantity, which you enter.
- **b** Then enter your login code or initials as the Counted by and the Date.
- **c** On the next tag, the system will remember the Counted by and Date until you change them. This speeds data entry.
- **d** Continue entering tag counts.

Note recounts have their own screen, Tag Recount Entry 3.16.12.

7 Check the Counted Tag Report 3.16.14.

8 Check the Inventory Variance Report 3.16.18. Look for warnings.

9 Use Inventory Balance Update 3.16.21 to update balances.

10 Delete the tags using Tag Delete/Archive 3.16.22.

Excess and Obsolete

1 Run the Projected Surplus Inventory Report 3.6.9.

- **a** Set the effective date to the month end, two months form now.
- **b** Direct the output to the Window.

  Why is everything surplus?

2 Set up a forecast using Forecast Maintenance 22.2 starting one month from now. Enter eight weeks of forecast for item 02-2000 at 100 per week for site 10.

3 Check your surplus report again for the same effective date.

Note the finished goods item is no longer on the report.

Why are the components?

4 Run Net Change Materials Plan 23.1 for site 10.

5 Check the surplus report again. Everything is now needed.

Extra Credit

1 Set up one of the following:

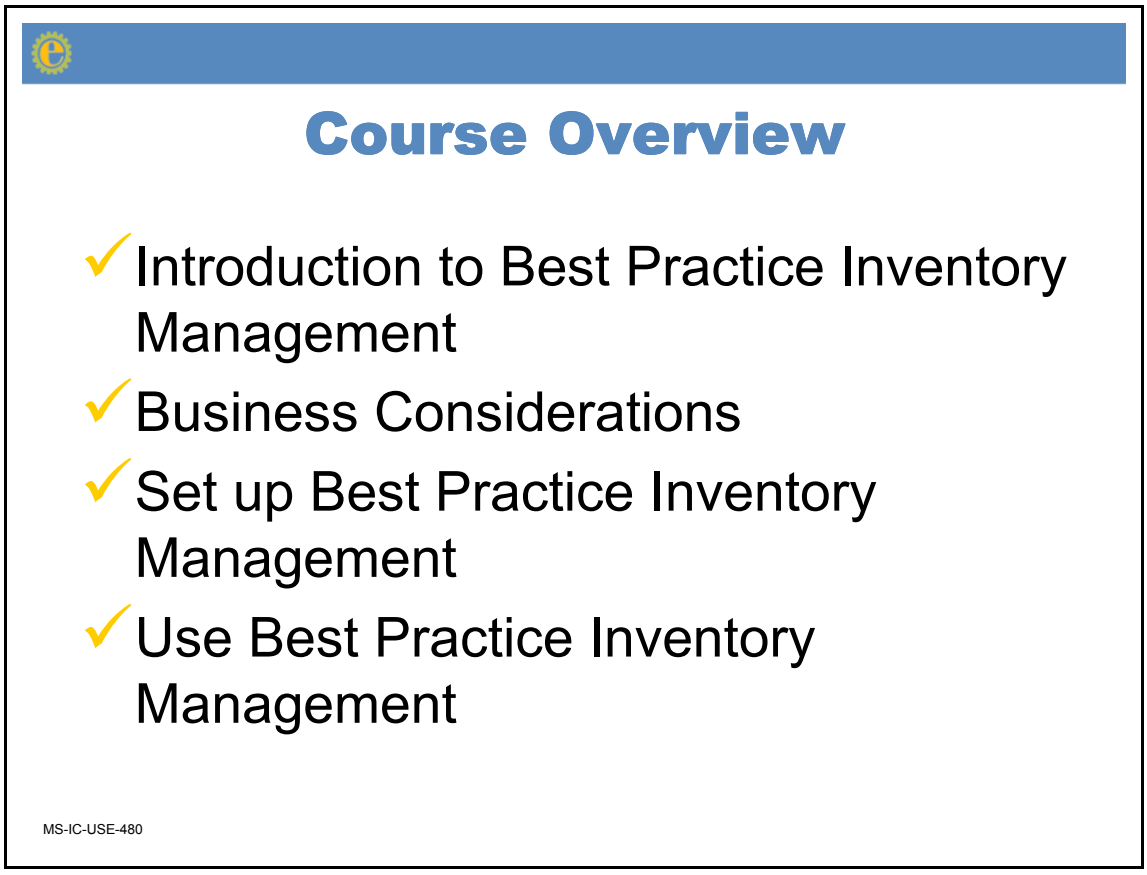
   a An MRO item and inventory location using the account code you that you set up in *Set up General Ledger* on page 52, or a consignment location using the account code that you set up in *Set up General Ledger* on page 52.

   b Process transactions in and out of these locations.

2 Run a balance sheet to see inventory asset value.

   a Use Transaction Post 25.13.7 and post transactions for entity 10.

   b Run your balance sheet using Balance Sheet 25.15.8.



Course Overview

APPENDIX A

Master Inventory Policy to Support Business Plan

The intent of this appendix is to demonstrate the kind and type of policy and procedure required to effect an outstanding inventory control process.

Not all possible situations are covered and no one policy or procedure will work for any given business. However, you should be able to point to your internal policy and procedure that covers the main points of those shown here, and any others required for your business.

Finished Goods Inventory

Finished goods inventory levels for product lines 1 and 2 shall be maintained to support a 98% service level–defined as 98% of all customer orders shipping within 24 hours from stock on hand. These values will be based on standard statistical analysis of our historic forecast error and current forecast sales.

Product line 3 will be supported to an 80% service level.

Product line 4 will be managed on a make to order basis, with the component inventory levels maintained to support a two-week shipping lead-time.

Quarterly, the Materials Manager and the Cost Manager will quantify the inventory valuation to support these service levels at current forecast and report to the Controller. The Controller will insure adequate financing to support these service-level goals.

Work in Process (WIP) Inventory

All WIP inventory will be maintained at lowest possible levels consistent with the finished goods service level.

Raw Materials Inventory

Raw materials inventory levels will be maintained consistent with the standard MRP plan for purchases and lead times, based on the sales forecast.

This will be modified by a statistical allowance for forecast error; and, from time to time, various promotional considerations which must be approved in advance by the Sales Support Team:

- Sales manager
- Marketing manager
- Materials manager
- Production manager
- Cost accounting manager

Raw materials inventory levels may be modified only by minimum buys required by some vendors and, occasionally, safety stock considerations which must be justified by the Materials Manager to the Cost Accounting Manager based on some business need, such as (but not limited to):

- Variable scrap or reject performance
- Unreliable vendors
- Inadequate planning to support market research or engineering development.

A quarterly report of the value of safety stock inventories will be prepared by the Cost Accounting Manager, justified by the Materials Manager and presented to the Sales Support Team and the Controller.

Inventory Evaluation Review

Monthly, the Sales Support Team and the Controller will review the costed ABC Analysis Report to insure that target inventory levels are being maintained–but not exceeded.

Master Inventory Transaction Control Policy

To insure timely and accurate perpetual inventory balances (and costs), the following general transaction guidelines will be supported by Procedural Work Instructions in all function areas.

All computer inventory transactions, receipts, issues, shipments, adjustments, moves, transfers, etc., shall be completed on the system by the operator who does the physical transaction immediately prior to doing the physical activity.

For example, purchase receipts are done on the system just before the material is received into Quality Assurance (QA) inspection. QA inspection does the electronic transfer to production stores immediately prior to moving the material into the production stores warehouse.

Any obvious discrepancy must be resolved before proceeding with the inventory transaction (receipt quantity does not agree with purchase order quantity, or item appearance does not match item description, for example). This discrepancy must be resolved before completing the material transaction. Material issues that cannot be resolved within one-half business day must be either received into, or moved into, a nearby “discrepant material” location until resolved.

Transactions with non-standard units of measure, for which there is no system unit of measure conversion, must be suspended (moved into a nearby “discrepant material” location) until resolved by the Materials Manger and the Engineering Manager.

Bar code devices will be used whenever and wherever available to record item number data.

Every area required to count inventory, receiving, stock room, finished goods shipping, QA inspection, production, and so forth, will be provided with appropriate counting devices, such as but not limited to:

- Optical counters
- Mechanical counters
- Sampling weight count scales
- Other electronic scales
- Machine-driven parts counters

All items stocked in inventory locations will be maintained in appropriate containers designed to both protect the material during storage and transport, as well as facilitate accurate counting.

All containers will be labeled at all times with the item number and quantity. Items decanted or unpacked from vendor-supplied containers must be repacked into appropriate containers and relabeled. Stores areas which repack–relabel material will be provided with appropriate bar code label printers to facilitate labeling.

Inventory Status Codes Procedure

All inventory will be maintained by status code. No blank status codes are allowed. The three codes used are: Good, Bad, and Maybe.

Additional codes may be requested from the materials team, (Inspection Manager, Engineering Manager, Materials Manager, Cost Accounting Manager). Justification for new codes will be rigorous.

- Good

  This code will be used for all materials and items which have been inspected and found to be in conformance with specification.

- Bad

  This code will be used for all materials and items which have been inspected and found to be out of conformance with specification. This material should be moved to either a return to vendor location, a scrap location, or a re-work location as soon as possible.

- Maybe

  This code will be used for all materials and items which have not been inspected and/or whose conformance with specification is questionable. This material should be moved to either an inspection location or Material Review Board (MRB) location as soon as possible.

Customer Returns

All customer returns will be received into the Returned Goods Location as Maybe, pending inspection and disposition to either re-work (labeling and packaging only) or scrap.

It is the responsibility of the Customer Service Team to insure all returns are dispositioned within five business days. Support from Quality Engineering, Accounts Receivable and/or Service and Repair is expected to insure that the customer return is either replaced, repaired, or credited, depending on customer wishes and circumstances.

The item returned must be either:

- Repaired and returned to customer
- Repaired and placed in re-furbished goods inventory
- Transferred to Service and Repair for salvage parts
- Scrapped

See Customer Service Policy for further details.

Expired Material

Age-dated material or items will be treated as any other Maybe material.

These materials may be retested at the discretion of the MRB and the expiration date extended. Retesting and extension of expiration date are the responsibility of the Quality Engineering Group. Otherwise, expired materials are processed as Bad.

Expired Material is determined by using the Current Surplus Inventory Report 3.6.8 once each month and dispositioning all material which has expired. To prevent excess write offs of expired material, the Inventory Detail Report 3.6.5 should be run at least once each month with the expiration dates set from the current date to a date two months from now. This will produce a list of material about to expire. Every effort should be made to use this material before expiration.

Excess Material

On-hand inventory in excess of two years requirements is excess. Excess inventory will be evaluated quarterly, based on current forecasts and MRP plans.

At least once a quarter use the Projected Surplus Inventory Report 3.6.9 set to use MRP plans, with the Effective Date set for one year from now. This will show if there is any remaining on-hand balance of any items. If there are any balances the report should be re-run with the effective date

set for two years from now. Any on hand balance after two years must be dispositioned as excess inventory.

Excess inventory may be dispositioned by any of the following methods.

- Develop a plan to use the material (consumed as COGS)
- Return the material to the supplier for credit (or partial credit) balance of cost written off as scrap
- Sell on open market to high bid (revenue taken as special sales, cost taken as COGS)
- Deliver to R&D, Engineering, Sales & Marketing, or Quality Engineering (write off cost to department budget)
- Deliver to Service and Repair (transfer cost to service and repair inventory)
- Otherwise disposition as Bad Material per procedure

This is the responsibility of the Materials Team:

- Inspection Manager
- Engineering Manager
- Materials Manager
- Cost Accounting Manager

and the Sales Support Team:

- Sales Manager
- Marketing Manager
- Materials Manager
- Production Manager
- Cost Accounting Manager

Material appearing on the excess inventory report two quarters in succession must be dispositioned.

Finished goods items in the category Excess are the responsibility of the Sales Support Team, and may be:

- Sold at discount
- Given away
- Donated to non-profit groups
- Used as test or demonstration samples
- Salvaged

- Recycled
- Scrapped

Raw material and component items in the category Excess are the responsibility of the Materials Team and may be:

- Returned to vendor
- Transferred to service and support
- Assigned substitute status by Engineering
- Transferred to Research and Development (R&D) for development use
- Donated to non-profit groups
- Salvaged
- Recycled
- Scrapped

The only exception to this standard are service and repair inventories. Service and Repair is covered by its own policy which allows up to ten years of forecast usage since the item was made obsolete.

Note Retention samples maintained by Quality Engineering for R&D and Engineering evaluation are not inventory. These items have been expensed and are maintained under separate policy and control.

Disposition of Bad Material

Finished goods items which are non-conformant for cosmetic reasons only and cannot be reworked may be dispositioned to:

- R&D
- Marketing or Engineering for testing, evaluation, or other use
- Employees for their personal use
- Charities with an appropriate use for the item
- Scrap

Finished goods items which are non-conformant for functional reasons, and cannot be reworked, may be dispositioned to:

- R&D or Engineering for testing, evaluation, or other use
- Marketing or Sales for static display or demo use only

- Scrap

WIP items which are non-conformant may be reworked if an approved rework procedure exists and is known to be cost-effective. The unit may be disassembled to salvage usable components and/or materials which must be inspected before being returned to stores. Otherwise, disposition is to scrap.

Raw material items which are non-conformant should be returned to the vendor. Otherwise, they are reprocessed to a salvage or recycle facility. If other methods are not possible, disposition is to scrap.

All non-conformant material must be dispositioned within 60 days. A status report will be reviewed monthly. Material which appears on the report at two consecutive month ends will be dispositioned to scrap.

Scrap Procedure

Items dispositioned to scrap will be moved to the scrap location.

At least once each month the Inspection Manager and the Cost Manager will review these items to evaluate the possibility of:

- Rework
- Repair
- Reprocess
- Recycle
- Salvage
- Return to vendor

If no practical alternate disposition is possible, the material will be placed on the pending scrap report with the cost of the transaction.

At least once per month (as required), the Inspection Manager, the Materials Manager, and the Regulatory Compliance Manager will insure and verify that this material is shipped, with appropriate documentation, using approved transportation, to an approved disposal site.

The Cost Accounting Manager will insure that the scrap inventory location is relieved and the appropriate booking to the scrap account occurs.

Material Storage Locations

All direct material must be stored in approved, system-defined storage locations.

Direct Materials Stores Locations will have Location Codes in the range of 20XXX.

Finished Goods Inventory will have Location Codes in the range of 80XXX.

Production Work Centers will have Location Codes equal to their Work Center Codes which are in the range of 50XXX.

Inspection Locations will have Location Codes in the range of 70XXX.

Departments which routinely hold inventory of direct materials for non-production use will have valid inventory locations set up for them. Non-Direct Material locations which store direct materials will have location codes in the range of NDXXX. These locations will have General Ledger Inventory Account Codes which are either expense type accounts or memo type accounts to correctly reflect the use of the material in those locations.

Each location will determine its need for the following special types of locations which, if needed, will conform to these codes:

- Returns XX600
- MRB XX700
- Discrepant Material XX800
- Scrap XX900

Material found in non-system defined locations will be assumed to have status Maybe and will be transferred to a Discrepant Material Location, an inspection location, or MRB location as soon as possible.

Additional storage locations may be requested from the Materials Team, (Inspection Manager, Engineering Manager, Materials Manager, Cost Accounting Manager). Justification for new locations will be rigorous.

All system locations will have a location type code. All items will have a location type code. Those locations and items which do not have special storage requirements or conditions will have the location type General.

Use of Direct Production Material

Non-production Use

All issues of direct material require an approved internal statement of demand.

Requests for direct material for non-production use, such as sales samples, engineering test units, material to be used by maintenance, field service, the repair center, or any other use, must be approved by the Materials Manager and must be issued to a valid internal document.

Approved documents for this use include:

- Expense type Work Orders with an valid Project Code
- Material Order with a valid Project Code, or Call ID (SSM) either internal or external (PRM module)
- Written request for Direct Material Transfer signed by the Material Manager. The latter will authorize an inventory transfer to the location code associated with the requesting department from which it will be expensed.

Unplanned Inventory Transactions

Unplanned transactions are not used by direct material inventory locations.

Unplanned inventory transactions, specifically:

- Issues Unplanned 3.7
- Issues Return to Supplier 3.8
- Receipts Unplanned 3.9
- Receipts Sales Order Return 3.10
- Receipts Return to Stock 3.11
- Receipts Backward Exploded 3.12

are never used in our system. See appropriate department procedures for detailed instructions on how to handle routine returns and adjustments.

Note Some indirect locations may use unplanned transactions where specified by their procedures.

Exceptional situation: If it appears a situation cannot be correctly accounted for by any other means, a written document explaining the situation and with the written concurrence of the

Materials Team, (Inspection Manager, Engineering Manager, Materials Manager, Cost Accounting Manager) may be submitted to the Controller for approval.

The Materials Manager may then be granted one-time access to the required transaction by the IS Manager. System lockout of the transaction will be replaced as soon as the transaction is completed.

Purchase Order Receipts Policy

All direct material purchases must be received against a valid purchase order (PO). There are no possible exceptions to this policy.

In the event an item is delivered to the receiving dock and either references no PO or references a PO which is not valid (has no open line quantity for the item being received within the current receiving date range tolerance), or the PO cannot be found on the system, the Buyer or Materials Manager must be notified immediately.

If the material is in fact needed, the Buyer must prepare the appropriate PO immediately and the PO receipt processed. If the material is not needed, it will be immediately returned to the vendor.

All vendors are required to label all shipments with bar code compatible data to include:

- Vendor name
- Vendor number and address
- PO number
- Item number
- Item description
- Quantity

All containers within a shipment must be so labeled.

Work Order Receipts & Returns Policy

All direct material receipts into a stores location must be made with a work order receipt transaction or an inventory transfer transaction.

There are no possible exceptions to this policy. Material being received into stores without a work order recode on the system will be returned to the submitting work center for correction of the information.

Materials (items) being received must be in proper storage containers, correctly labeled with item number, lot number, quantity, and reference number and grade code if appropriate.

Work orders are always received, never backflushed.

Work order returns, that is materials not needed to complete the work order for any reason, are returned to stores via Quality Assurance, who will verify the materials are as labeled and compliant with current standards. Materials will be presented to the stores personnel with the appropriate QA documentation verifying their status. Stores personnel will process the transaction using a negative work order issue to return the items to stores inventory.

Inventory Transfer Procedure

It is occasionally necessary to move materials between stores locations.

Stores personnel are granted broad flexibility to move materials between stores locations using inventory transfer transactions. Moving finished goods items to raw material locations and moving raw materials to finished goods locations are specifically prohibited.

Movement of raw materials from stores locations to work center stock locations may be done with a repetitive pick list transaction. Lacking a repetitive pick list, material may be moved with an inventory transfer transaction if a system-generated statement of demand is provided (a work order pick list with floor stock items, for example).

Cycle Count Procedure

All direct material inventory locations will be cycle counted.

Our cycle count intervals are:

- 30 days for A items
- 60 days for B items
- 90 days for C items

No other class codes are used. Specifically, class Z items are not used.

The system is used to assign all Class Codes based on cost. No manual override is allowed. An item deemed to require Class A control whose value does not put it in Class A may be controlled using other system features, such as safety stock or location controlled allocation by humans.

Each day the cycle count worksheet report will be run for all locations. The report will be run for overdue items only. The items in each area location, to be counted each day, will be divided equally among the personnel in that location, on that day. Work center locations are counted by work center personnel, stock room locations by stock room personnel.

Mindful of picking cutoffs, the raw materials area is generally counted in the afternoon as receipts are being processed in the morning. The finished goods area is generally counted in the morning as shipments are processed in the afternoon. Work center locations are counted at the discretion of the supervisor.

The cycle count worksheet for all areas will be completed each day. Overtime is authorized if required and justified.

All out-of-tolerance counts will be researched and reported on, with corrective action taken. Corrective actions requiring the cooperation of other groups will be submitted in writing to the Materials Team for implementation.

Zero Lot Adjust

Every time an issue or move transaction consumes the last of a lot, a cycle count of zero will be made.

APPENDIX B

Inventory Transaction Codes

Transaction Codes

Transaction codes in ***bold italics*** are system required and cannot be restricted except by menu security access.

These codes are used in Inventory Status Code Maintenance, 1.1.1 to restrict transactions for inventory of a given status. There are used in Item Status Code Maintenance, 1.1.5 1 to restrict transactions for items of a given status. There are used in Inventory Movement Code Maintenance, 1.1.9 to define the transaction that is associated with a specific Inventory Movement Code. Inventory Movement Codes are associated with Global Shipping functionality.

ADD-FC	Add Forecast
ADD-PO	Purchase Order Maintenance
ADD-PS	Product Structure Maintenance
ADD-RE	Repetitive Functions
ADD-SO	Sales Order Maintenance
ADD-SQ	Sales Quote Maintenance
ADD-WO	Work Order Maintenance
CST-ADJ	Cost Adjustment
CUM-SADJ	Cumulative Order Schedule Adjustment
CUM-RADJ	Cumulative Order Receipt Adjustment
CYC-CNT	Cycle Count - Initial
CYC-ERR	Cycle Count Error
CYC-RCNT	Cycle Count - Recount
ISS-CHL	Inventory Detail Maintenance location change issue
ISS-DO	Distribution Order Shipment
ISS-FAS	Configured Item Component Issue
ISS-GIT	Distribution Order Issue to Goods in Transit
ISS-PRV	Purchase Order Return to Vendor (supplier)
ISS-RMA	Pseudo Trans-Type for RMA Receipt
ISS-RV	Inventory Return to Vendor (supplier)
ISS-SO	Sales Order Shipment (issue)
ISS-TR	Inventory Transfer Issue

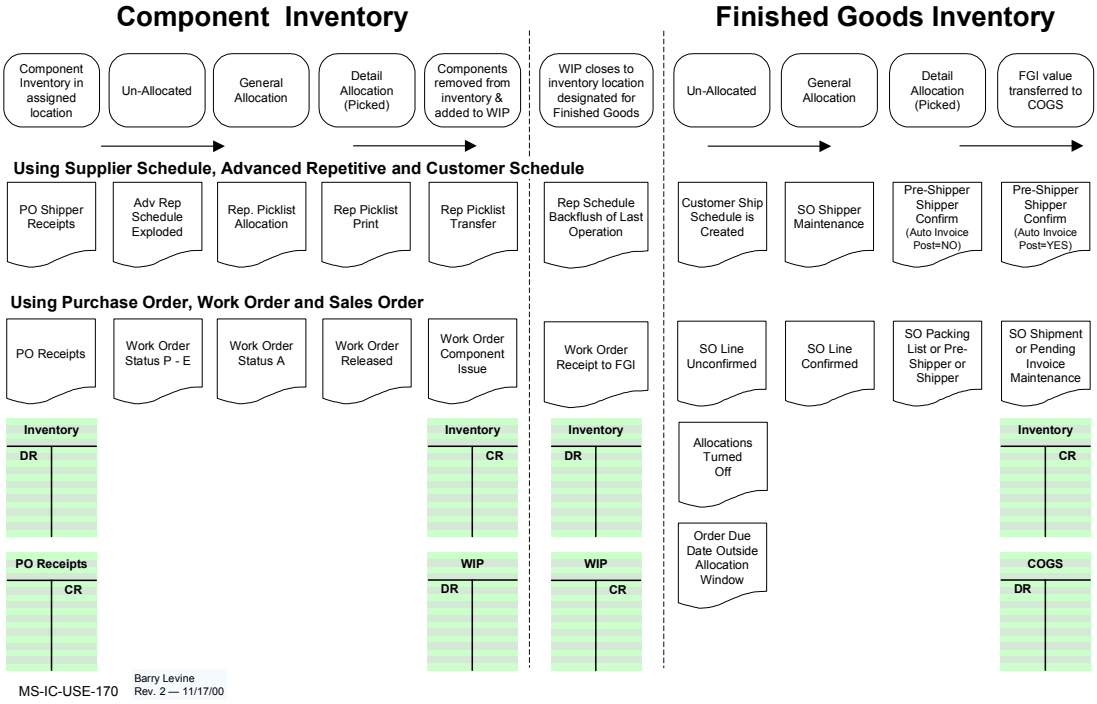
ISS-UNP	Inventory Unplanned Issue
ISS-WO	Work Order Issue, Component Backflush
ORD-PO	Purchase Order Booking
ORD-SO	Sales Order Booking
RCT-CHL	Inventory Detail Maintenance location change receipt
RCT-DO	Distribution Order Receipt
RCT-FAS	Configured Product Receipt
RCT-GIT	Distribution Order Receipt from Goods in Transit
RCT-PO	Purchase Order Receipt
RCT-RS	Inventory Return to Stock
RCT-SOR	Inventory Sales Order Return
RCT-TR	Inventory Transfer Receipt
RCT-UNP	Inventory Unplanned Receipt
RCT-WO	Work Order Receipt, Repetitive Receipt
RJCT-WO	Work Order Reject
TAG-CNT	Physical Inventory Update
WIP-ADJ	Work-in-Process Adjustment
WO-CLOSE	Work Order Close

- Use Transactions Detail Inquiry 3.21.1 to display:
  - Detailed inventory transaction history records ordered by transaction number
- Use Transactions by Item Browse 3.21.2 to display:
  - Inventory transaction history for an item number ordered by transaction date, starting with the most recent
- Use Transactions by Order Report 3.21.13 to display:
  - Inventory transaction history by sales order or work order number

APPENDIX C

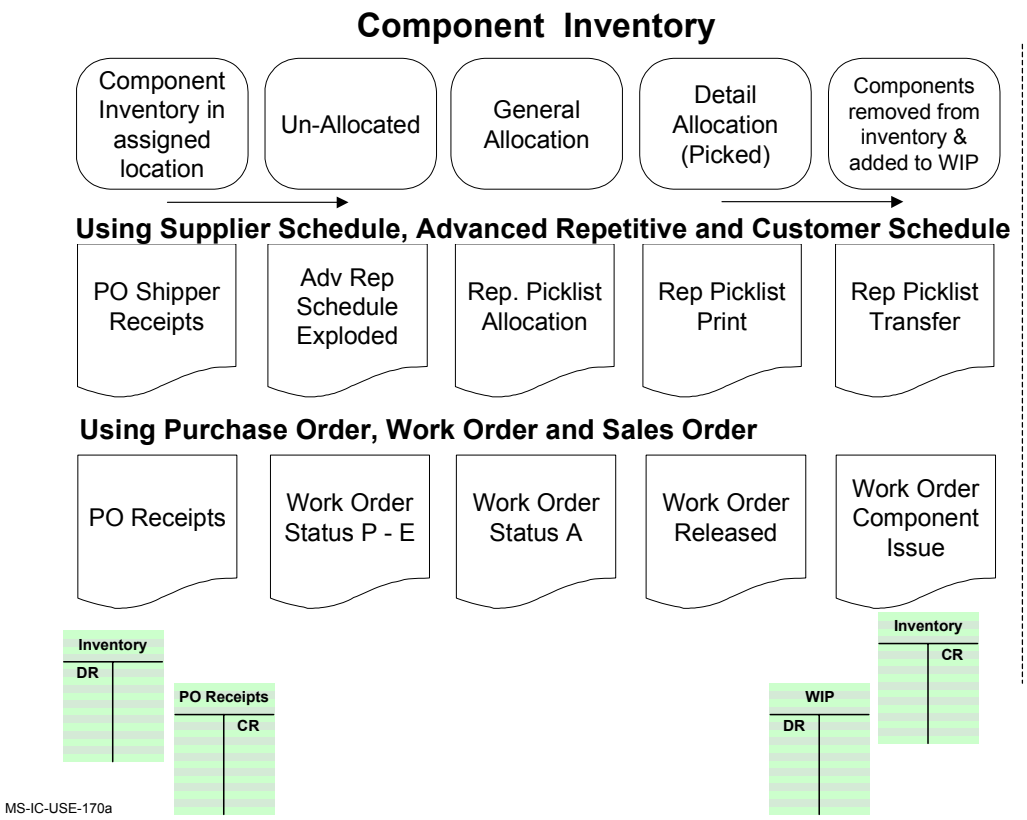
Allocation Cycle

Allocation Cycle From Purchased Components through Finished Goods Shipment

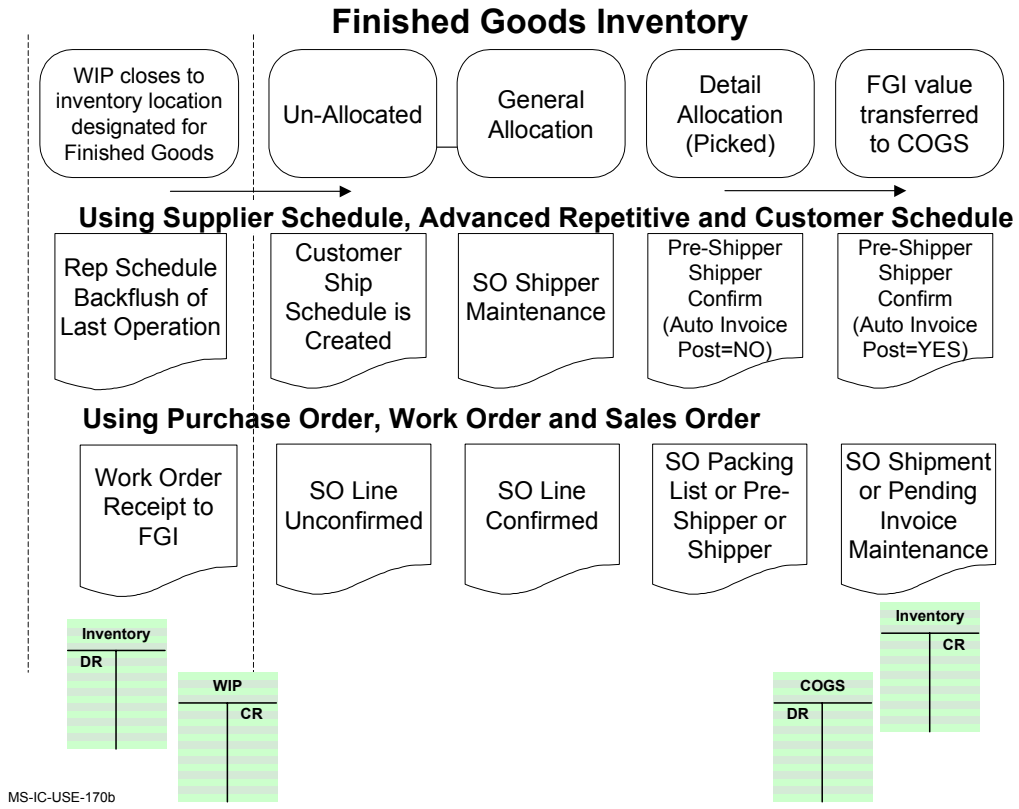


Allocation Cycle: Purchased Components Through Finished Goods Shipment

See close-up on next pages.



Component Inventory



Finished Goods Inventory

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Item number: 70-2837B

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