MFG/PRO® eB

MFG/PRO For Engineers

ACTIVITIES GUIDE

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Case Study


Quality Products Corp.
User Menu Edit Queue Options Help
Manufacturing
Distribution
Master Files
Manufacturing
Custom
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TIME-TO-BEN
WACAM

Magic Box Failure and Fix Activity

The subject of this activity is a product known as the Magic Box. The part number is 12-100.

You work for a company that manufactures, sells, and services capital equipment. The products are electro/mechanical devices that are large enough to require on-site service and repair.

Shortly after releasing the new model of the product, disaster struck. Field units began to fail. The service calls came pouring in. In spite of the best efforts of your Service Engineers, the failures, electrical in nature, kept occurring. The failures only occur when the machines are running above 80% of their maximum rate.

Following an exhaustive and heroic effort of the combined engineering groups, a solution was found. The bad news is that the mother board, part number 12-102, must be replaced with a newly designed PCB assembly, part number 12-112.

Here are the facts as we know them today:

1. The fabricator for the new PCB can begin delivering part number 12-112 at a rate of 100 per week from their prototype line until the production line tooling is available. The first delivery of 100 mother boards will arrive one week from this coming Monday and will continue at 100 per week for three additional deliveries. After that, the production tooling will meet all of our production needs.
2. There are currently 224 Magic Boxes in the field. The Marketing Vice President has directed that units in the field be upgraded prior to building new systems or retro-fitting Finished Goods Inventory (FGI). The Field Engineers will require a new Service Procedure containing the new systems test routine.
3. The reworking of FGI requires a unique set of instructions contained in a newly written, but yet to be released document. Its release is critical to the availability of the 330 Magic Boxes that are currently held by Quality Control with a quarantine status.
4. All Work in Process (WIP) and future orders will be built using the revised assembly procedure containing the additional systems test routine as well as the changes associated with the new mother board.

Instructions: Your task is to write the change order(s) that will govern the activities and document release or revisions that remedy the current crisis. Be sure that the information you include in your documentation is sufficient to provide Purchasing, Production, Planning, Quality Control, and Field Service all of the instruction that is required to accomplish their tasks with only one possible interpretation.

CHAPTER 1

Initial MFG/PRO Setup Activities

Business Issues

Individually, or in small groups, examine your company (or a company your instructor suggests) against the business issues discussed in the Pre-Setup Business Issues chapter of the Initial MFG/PRO Setup training module. Consider the following:

1. The business expectations given your type of company, and
2. Additional information you may need to gather in order to successfully set up MFG/PRO for your company.

The purpose of this exercise is to help you focus on what is important for your company about the MFG/PRO implementation process.

Your instructor may ask you to list business requirements on an easel or white board to make it easier to share and review your findings with the whole class.

Setup

Item Status Code

Instructions: Use Item Status Code Maintenance 1.1.5 to add a new item status code.

1. Use your down arrow to display existing item status codes.
   a. Advance your cursor the next frame.
   b. Review the restricted transactions for the item status code.
2. Add a new item status code, Exper, with a description of Experimental
3. Add the following Restricted Transaction Codes:
   a. ADD-PS
   b. ADD-SO
   c. ADD-WO
   d. ISS-SO
   e. ISS-WO
4. Press F2 to save.

Cost Center

Instructions: Use Cost Center Code Maintenance 25.3.20 to set up a Cost Center for Magic Box in the General Ledger.

Cost Ctr:	12
Description:	Magic Box
Active:	Yes
From Account:	1035
To Account:	9510

Inventory Status Code

Instructions: Use Inventory Status Code Maintenance 1.1.1 to set up the following inventory status code:

Status Code:	OI-NO
Available:	Yes
Nettable:	Yes
Overissue:	No

Product Line Information

Instructions: Use Product Line Maintenance 1.2.1 to set up the following product line information:

Product Line:	12
Description:	Magic Box
Taxable:	No
Tax Class:	Blank

Inventory Accounts

Inventory Acct:	1500	12
Inv Discrep Acct:	5900	12
Scrap Acct:	5800	12
Work in Process Acct:	1600	12
Method Variance Acct:	6200	12
Cost Revalue Acct:	1550	12

Sales Accounts

Sales Acct:	3000	12
Sales Disc Acct:	3900	12
COGS Material Acct:	5050	12
COGS Labor Acct:	6860	12
COGS Burden Acct:	6480	12
COGS Overhead Acct:	6495	12
COGS Subcontract Acct:	5070	12

Item Status Codes

Instructions: Use Item Status Code Maintenance 1.1.5 to enter the following restricted transactions for item status code Proto:

Item Status:	Proto
Description:	Prototype
Restricted Transactions	ADD-SO
	ISS-DO
	ISS-SO

Site Data

Instructions: Use Site Maintenance 1.1.13 to enter site information for the Magic Box Plant.

Site:	12	
Description:	Magic Box Plant	
Entity:	1000	
Default Inventory Status:	OI-NO	
Automatic Locations:	No	
Database:	Blank	
EMT Supplier:	Blank	
External Supplier:	No	
Transfer Variance Acct:	5030	12

Location Data

Instructions: Use Location Maintenance 1.1.18 to set up a Stock location at Site 12.

Site:	12
Location:	Stock
Description:	Component Stock Room

Instructions: Set up a location for finished goods inventory at Site 12.

Site:	12
Location:	FGI
Description:	Finished Goods Inventory

Inventory Control File

Instructions: Use the Inventory Control File 3.24 to enter the following information:

Summarized Journal:	Yes
Journal Reference Method:	0
Default Site:	12

Addresses and Company Name

Instructions: In this exercise, use Company Address Maintenance 2.12 to customize the screens and reports to show your company name.

1 Add the company address for Magic Boxes Inc., Company ID = 12, has already been entered into the system. Personalize your database by replacing the Quality Products company name with your name in address code 10000.

2 Enter your name under the Address codes ~reports and ~screens. This causes your name to be displayed on the top of all reports and at the top of all the menu screens.

Note Menu screen changes may not take effect until reentering MFG/PRO.

User IDs

Instructions: Use User Maintenance 36.3.18 to set up the following user IDs:

User ID	Language	User Name	Employee
Eng1	US	Engineer 1	Yes
Eng2	US	Engineer 2	Yes
Pln1	US	Planner 1	Yes
Pln2	US	Planner 2	Yes
Mfg1	US	Mfg. Manager 1	Yes
Mfg2	US	Mfg. Manager 2	Yes
QEng1	US	Quality Engineer 1	Yes
QEng2	US	Quality Engineer 2	Yes
Acct	US	Cost Accountant	Yes
Your Login	US	Your Name	Yes

Note There are no default values for E-Mail Definition Maintenance 36.4.20 because e-mail systems vary widely. When implementing PCC in your business, you need to set up the system parameters before using e-mail notification.

There are no exercises for setting e-mail in this training course, because of the system-specific administration. Your e-mail system administrator needs to be involved in setting up the parameters of e-mail within MFG/PRO. Continue with the User ID exercise.

Generalized Codes

Instructions: Use Generalized Codes Maintenance 36.2.13 to enter the following:

Field Name: pt_rev

Value	Comments
1	Prototype Rev
2	Prototype Rev
3	Prototype Rev
4	Prototype Rev
5	Prototype Rev
6	Prototype Rev
7	Prototype Rev
8	Prototype Rev
A	Production Release
B	Production Revision
C	Production Revision
D	Production Revision
E	Production Revision
F	Production Revision
G	Production Revision
H	Production Revision

Instructions: Continue entering the following generalized codes:

Field Name: ECM_ECR_DSPN

Value:	UAI	POO	WIP	FGI	FUP
Comments:	Use as is	Rework parts on order	Rework WIP	Revise thru FGI	Requires field upgrade

Reason Code Severity Levels

Instructions: Use Reason Code Maintenance 36.2.17 to enter the information below in order to set up reason code severity levels.

Reason Code	Reason Type	Description
10	PCO	No effect parts/process
20	PCO	Rework parts on order
30	PCO	Rework on order/WIP
40	PCO	Rework thru WIP/scrap
50	PCO	Effect thru FGI
60	PCO	Rework thru FGI/scrap
70	PCO	Rework thru field units
80	PCO	Replace field units

Window Help

Instructions: Use Window Help Maintenance 36.4.21 to add the following information:

Field: ECM_ECR_DSPN

Calling Procedure: Blank

Procedure to Execute: GPLU072.P

PCC Groups

Instructions: Use Group Maintenance 1.9.1.1 to create PCC groups and assign members to the groups. Enter group name and press GO. Enter description and press GO. At right of window, press ADD. Enter user ID and press GO twice. Press Group Master button to enter next group. Repeat until all user IDs are entered.

Group	Description	User IDs
Design	PCC Design Group	Eng1
		Eng2
		QEng1
		QEng2
		Your Login
Eng/Apv	Engineering approval	Eng1
		Eng2
		Your Login
Pln/Apv	Buyer/planner approval	Pln1
		Pln2
		Your Login
Mfg/Apv	Mfg. manager approval	Mfg1
		Mfg2
		Your Login
Qual/Apv	Quality Eng. approval	QEng1
		QEng2
		Your Login
Dist	PCO Distribution List	Pln1
		Mfg1
		QEng1
		Acct
		Your Login

Item Data

Instructions: Use Item Data Maintenance 1.4.3 to enter the item data information below.

Item #	Description	Prod Line	Design Group	Status	Rev
12-100	Magic Box Assy	12	Design	AC	A
12-101	Assembly	12	Design	AC	A
12-102	PCB Assy	12	Design	AC	A
12-103	Packaging material	12	Design	AC	A
12-104	Label	12	Design	AC	A
12-105	Switch	12	Design	AC	A
12-115	Sub-assembly	12	Design	AC	A
AP12-101	Assembly procedure for Magic Box	12	Design	AC	A
AP12-100	Assembly procedure for packaging Magic Box	12	Design	AC	A

Item Inventory Data

Instructions: Use Item Inventory Data Maintenance 1.4.5 to enter the following inventory data:

Item #	Lot/Serial	Site	Location
12-100	S	12	FGI
12-101	L	12	Stock
12-102	S	12	Stock
12-103		12	Stock
12-104		12	Stock
12-105		12	Stock
12-115	L	12	Stock

Item Planning Data

Instructions: Use Item Planning Maintenance 1.4.7 to enter the following item planning data:

Item #	Order Quantity	Pur/Mfg	Mfg LT	Pur LT
12-100	10	M	1	
12-101	10	M	1	
12-102	10	P		5
12-103	10	P		2
12-104	10	P		12
12-105	10	P		5
12-115	10	P		12

Item Cost Data

Instructions: Use Item Cost Maintenance 1.4.9 to enter the following item cost data:

Item #	Price	G/L Cost Material	Curr Cost Material
12-100	5,000.00		
12-101			
12-102			25.00
12-103			1.25
12-104			.05
12-105	15.00		1.25
12-115			35.00

Study Questions

1 When setting up an item, which data must be the same at all sites?

2 All fields can be validated by generalized codes.

True or False? Why?

3 How would you set up the pop-up window so it only appears for the ABC Class field in Item Master Maintenance?

4 What is the default unit of measure?

5 How would you set up a global alternate unit of measure?

6 When is the exchange gain/loss account used?

7 When setting up exchange rates, to make sure you do not leave out a date, it is a good idea to overlap the dates.

True or False? Why?

8 How might you define product lines in your company? What things would you consider?

9 When you add a new product line, the GL accounts default from where?
Menu Name/Number:

10 Items can belong to multiple product lines.
True or False? Why?

11 Sites can have multiple entities.
True or False? Why?

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Answers

1 General item data.

2 False. Field must be linked to a validation program for it to be validated.

3 Use Window Help Maintenance 36.4.21, and enter the procedure name for Item Master Maintenance in the Calling Procedure field. You find the procedure name by selecting the About option from the Help pull-down menu on the Main Menu bar.

4 EA (Each).

5 Leave the Item Number field blank.

6 Tracks realized gain/loss on foreign currency payables relative to the system base currency. GL transactions are created for it whenever the exchange rate fluctuates between the voucher and payment dates.

7 False. Dates cannot overlap.

8 Look for similar characteristics such as manufacture, use, application, cost analysis or revenue analysis.

9 From System/Account Control File 36.1.

10 False. Each item can belong to one–and only one–product line.

11 False. Each site can belong to one–and only one–entity.

Workshop

Situation 1

Your company sells both kitchen products (blenders, etc.) and beverage products (wine, etc.). In the following workshop you will set up your company's product lines and items.

Instructions:

1 Check the system base currency and primary entity.

Menu Name/Number:

2 Set up at least two sites for your company, making one a distribution site.

a Make sure you enter the primary entity on each.

b Set each site so that it has the ability to create automatic locations.

Menu Name/Number:

3 Set up at least one location (stock, for example) at each site.

Menu Name/Number:

4 Set up at least two product lines (Finished, Components, for example).

a Make each product line non-taxable.

Menu Name/Number

5 Select one of the products your company sells (kitchen products or beverages).

a Set up items for the product.

b Set up at least two items, assigning some to each product line.

Menu Name/Number:

6 Set the finished item up at the distribution site. This item is not a manufactured item, rather it is a DRP item.

Menu Name/Number:

a How do you set the item up at the distribution site?

b How do you show it is a DRP item?

Situation 2

Your company has opened a branch in France.

Instructions:

1 Check to see if a currency code exists for French Francs. If it does not, set one up.

Menu Name/Number:

a Set up a series of exchange rates, beginning with today.

Menu Name/Number:

2 Enter a new bank account for the foreign currency.

Menu Name/Number:

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Answers

Situation 1

1 Use System/Account Control File 36.1. Base Currency and Entity.

2 Use Site Maintenance 1.1.13. Set Entity to the primary entity (from System/Account Control File 36.1) and Automatic Location to Yes.

3 Use Location Maintenance 1.1.18.

4 Use Product Line Maintenance 1.2.1. Set Taxable to No and leave Tax Class blank.

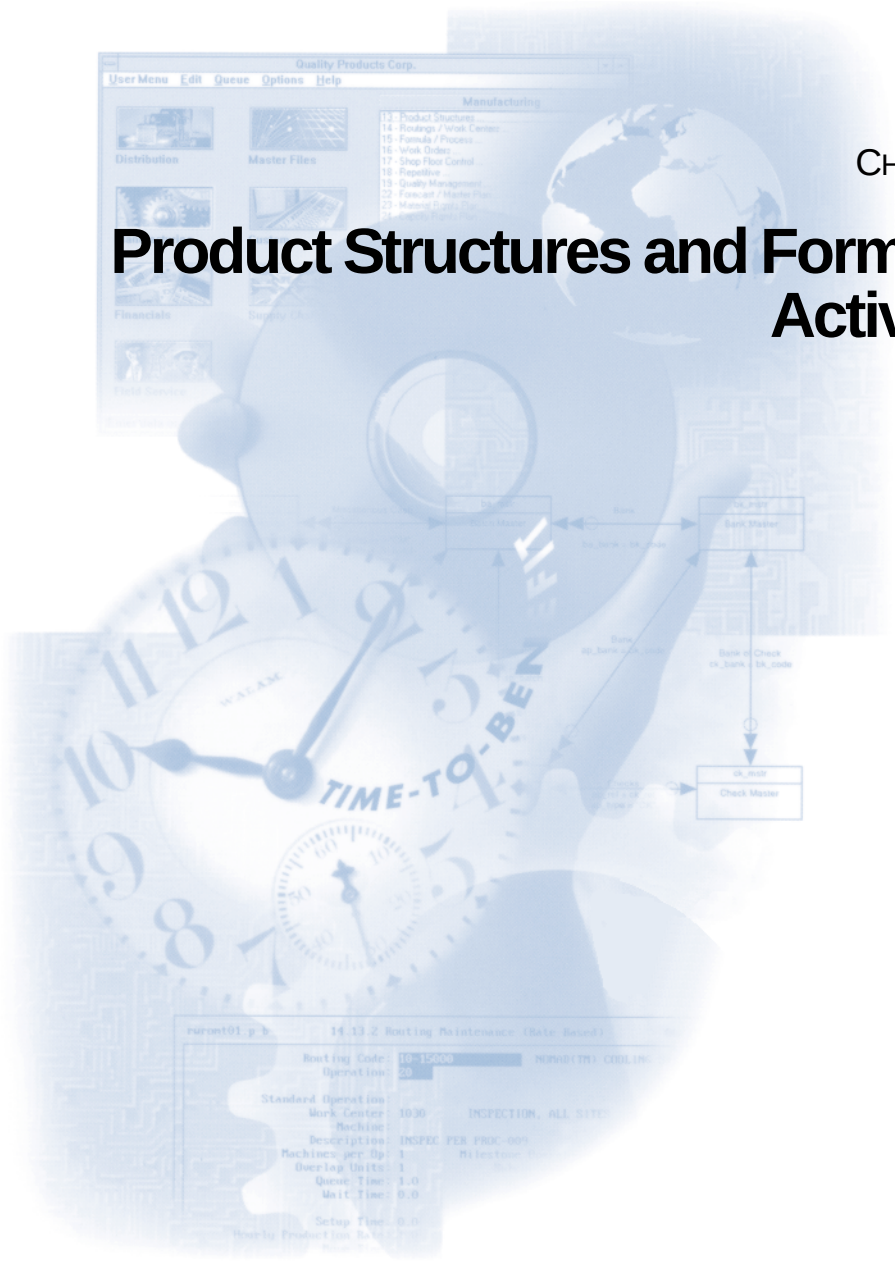
5 Use either Item Master Maintenance 1.4.1 or Item Data Maintenance 1.4.3.

6 Use Item–Site Planning Maintenance 1.4.17 for the distribution site. Set Pur/Mfg to D.

Situation 2

1 Use Exchange Rate Maintenance 26.4. In the lower frame, define a series of time frames and assign an exchange rate to each time frame. Use Exchange Rate Browse/Inquiry 26.5.

2 Use Bank Maintenance 26.13.



CHAPTER 2

Product Structures and Formulas Activities

Setup

Product Structures

Instructions: Use Product Structure Maintenance 13.5 to enter the following product structure data for parent item 12-100:

Component

Item	Qty Per	UM	Structure Type
12-101	1	EA	–
12-103	1	EA	–
12-104	1	EA	–
AP12-100	1	EA	D

Instructions: Enter the following for parent item 12-101:

12-102	1	EA	–
12-105	1	EA	–
12-115	1	EA	–
AP12-101	1	EA	D

Review Product Structure Inquiry

Instructions: Verify the product structure data using Product Structure Inquiry 13.6.

Study Questions

Product Structures and Formulas

1 List two situations where you would use a BOM code as a parent in a product structure rather than the item number.

2 A certain resistor that you use in making several of your products has been found defective. What function would you use to find out which products use this resistor?

Menu Number/Name:

3 A lead time offset of 3 indicates that you need this component item three days before production of the parent item begins.

True or False?

4 List two situations in which lead time offsets can be used.

5 What three options do you have for expressing quantity per?

Alternate Structures and Formulas

1 Material requirements planning (MRP) does not consider the scrap percentage you enter on a formula.

True or False?

2 Processing operations can be entered in Routing Maintenance 14.13.1 or in Process Definition Maintenance 15.13 even if the item batch size is greater than 1.

True or False?

3 How can you prevent a formula from being modified using Product Structure Maintenance 13.5?

4 List three situations where you would need to set up alternate product structures or formulas in your company.

5 The MFG/PRO modules _____ and _____ always plan component requirements based on the standard BOM and routing for the item.

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Answers

Product Structures and Formulas

1 BOM codes would be used to identify product structures that are:
- common to several items
- alternates for a given item
- batch quantity specific
- site specific

2 Where-Used Browse/Inquiry 13.8.1 or Where-Used Report 13.8.14.

3 False. -3 says you need it before, +3 says you need it after.

4 Lead time offset applies when you have:
- long lead time items
- expensive components, not needed until late in the process
- components that need preparation

5 (Blank) Quantity Per Unit, (P) Percent of Batch or (B) Quantity Per Batch

Alternate Structures and Formulas

1 False. MRP plans scrapped quantities using that percentage.

2 False. Both are stored in the same place, but the latter is used whenever there is a batch size greater than 1 because it converts the run time/batch that you enter into an equivalent run time/unit.

3 Use Formula Code Maintenance 15.1 and set Formula to Yes.

4 Possibilities are different BOMs for different sites, different processes or different batch sizes.

5 MRP and Repetitive.

Workshop

Product Structures and Formulas

Let us consider the company that makes battery-powered and electric blenders. Both of these products use the same components, except for the motor. Both use a blender jar, lid, plastic case, six power/speed push buttons, and motor. One uses a battery-power adapter unit, and the other uses an electric-power adapter unit and a cord. All of these component items are purchased.

1 Set up the product lines, items, and product structures you need to make both blenders. Use a different item number for each of the finished items, and make both lot traceable.

2 Historically, this company has found that two percent of the electric power-adapter units they purchase fail incoming inspection. Where would you indicate this?

Menu Number/Name:

Field Name:

3 Lately, they have been having quality problems with the push buttons: the color has been inconsistent and they must throw out about five percent of them. Where would you indicate this?

Menu Number/Name:

Field Name:

4 Customers are reporting that there is a major problem with the blender; the glass jar explodes if it is overfilled. You need to switch production immediately to use a plastic jar. What do you do in MFG/PRO? List all of the functions you think you would need to use in the sequence you would use them.

5 The old lid can be used with the new plastic jar, but engineering has designed a new one that fits better. How would you set this up so that your costs are minimized?

Instructions: We will make some beer. Our beer is made with water, barley, hops, and a secret ingredient.

1 Beer is made in batches of 480 bottles. Set this up in MFG/PRO. What two fields did you have to update? What function did you use to update each?

Field Name:

Field Name:

Menu Number/Name:

Menu Number/Name:

2 Set up the formula to make beer. Harvey uses 50 pounds of barley and 5 pounds of hops in each batch, and just a little bit of the secret ingredient per bottle. Of course, about 95 percent of each bottle of beer is water! Which Qty Type option did you use to express each of these quantities?

Qty Type:

3 How do you indicate on the formula the point in the process at which an ingredient is used?

4 Add the bottle and case into the item file. Add the bottle and case into the BOM for beer. Can you enter this using Product Structure Maintenance 13.5?

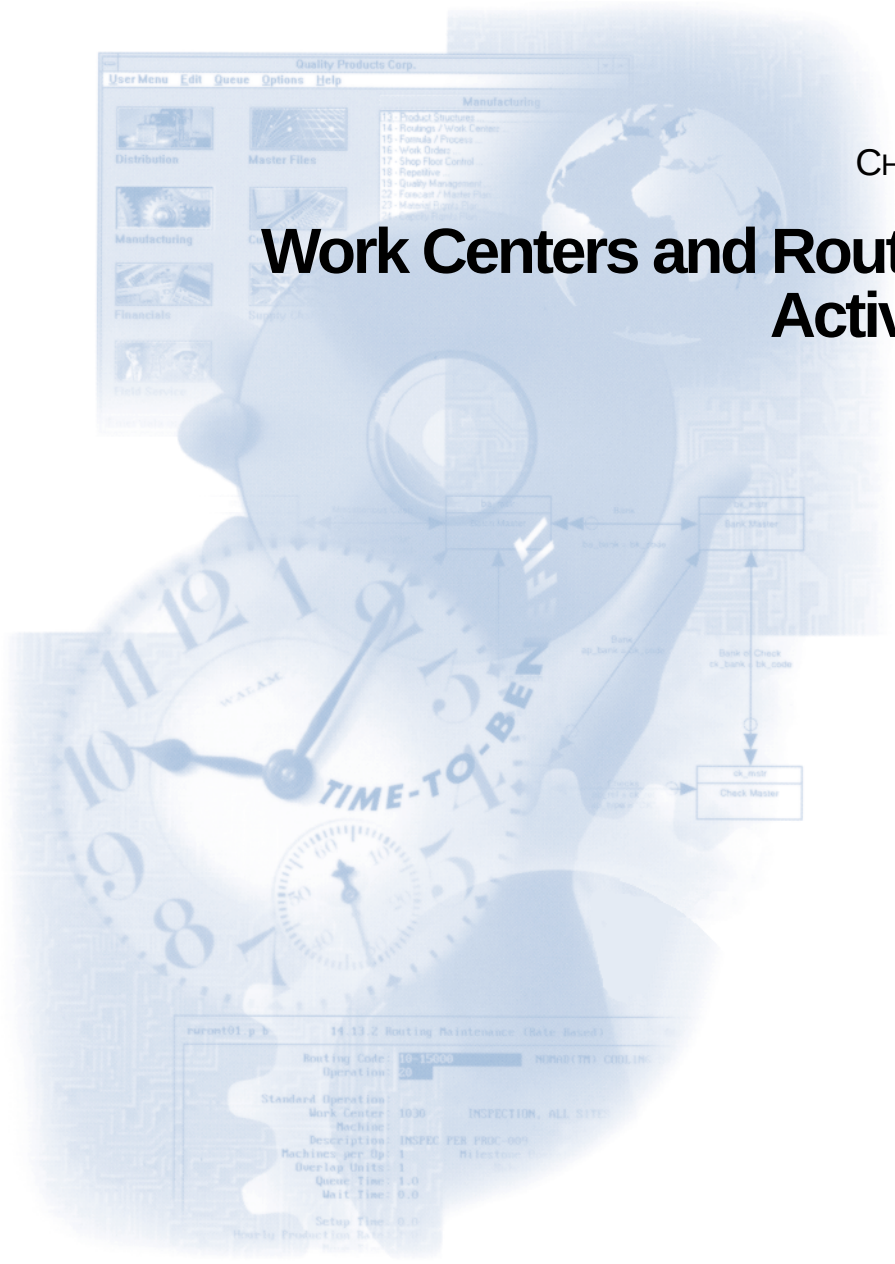
Yes or No? Why?

5 Harvey did some test runs and found out that the batch size of 480 bottles of beer is too large. He has to cut the batch size in half. What do you need to do to indicate this?

Alternate Structures and Formulas

1 Set up an alternate formula and process (perhaps use a different set of ingredients and a different production line for making beer).

2 Look at the Formula Browse/Inquiry 15.6. How does the alternate formula appear?



CHAPTER 3

Work Centers and Routings Activities

Setup

Important The data used in these exercises may not be the same as the data shown in the screen captures in this lesson.

Department

Instructions: Use Department Maintenance 14.1 to set up a department for the production of the Magic Box by entering the following information:

Department:	Dept
Description:	Magic Box Production

Work Center

Instructions: Use Work Center Maintenance 14.5 to set up a work center for Magic Box Assembly by entering the following data:

Work Center:	Magic
Description:	Magic Box Assembly
Department:	Dept
Setup Rate:	25.00
Labor Rate:	20.00
Lbr Bdn %:	100.00

Routing

Instructions: Use Routing Maintenance 14.13.1 to set up routing by entering the following data for Routing Code 12-101:

Operation:	10	20
Work Center:	Magic	Magic
Description:	Assemble Magic Box	Test Magic Box
Setup Time:	1.0	0.0
Run Time:	0.4	0.1

Instructions: Set up routing by entering the following data for Routing Code 12-100:

Operation:	10
Work Center:	Magic
Description:	Package the product
Setup Time:	0.5
Run Time:	0.1

Routing Cost Rollup

Instructions: Use Routing Cost Rollup 14.13.13 and enter the following site information:

Site:	12

Instructions: Use Product Structure Cost Rollup 13.12.13 and enter the following site information:

Site:	12

Instructions: Print the product structure cost rollup information, using Window as your output device. You will see that the cost for item 12-100 is $94.05.

Copy Current to G/L

Instructions: Use Copy Current to G/L 1.4.22 to copy from current to G/L.

Study Questions

1 What are the primary uses of departments in MFG/PRO? (List two.)

2 How might you set up departments and work centers in your company (or any company you know well)? What things would you consider?

3 When you set up a work center, the number you enter in Mach/Op should not be less than the number of machines entered in Machines.

True or False?

4 Wait time is the amount of time that completed work spends at a work center before it moves on to the next work center. Think about your company and where this may apply. List three situations where you would use wait time.

5 When a standard operation changes, the system automatically transfers the changes to all the routings that reference that standard operation.

True or False?

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Answers

1 The primary uses of departments are:

a Accounting: GL account defaults are established by department.

b Capacity requirements planning: labor capacity of associated work centers.

2 There is no one correct answer. You need to look at how your company reports capacity and production costs.

3 False. Mach/Op should be less than or equal to the number of machines in the work center.

4 The key here is that wait time cannot be compressed. Usually, wait time is specified for mandatory processes like cooling, drying or curing.

5 False. You must run Routing Update 14.13.7 to do this.

Workshop

Your company has just opened a new production area to make beer. The owner's son, Harvey Ripple, has developed a revolutionary new brewing technique–a process where it takes only one day to brew and bottle the beer and then the aging process takes place in the bottle. Of course, he expects to make millions on this, since it tastes just as good as beer brewed in the traditional way. They have decided to name the beer after Harvey, naming it HRipple Beer.

The production line consists of two machines, one for mixing and the other for bottling. The basic ingredients are water, barley, and hops. All ingredients are piped into the mixing machine directly and stirred together for 15 minutes. A significant part of the process is the addition of the secret ingredient, which is added to the mixture after it sits for one hour.

Immediately after adding the secret ingredient, the mixture is bottled. The bottling machine can fill 120 bottles each hour, and the bottles are packaged 12 per case. Cases must be stored in a dark place for three full days before they can be shipped. This step is vital. Anyone who drinks the brew before it has aged three days will get very sick.

Initially, there are only two people working this production line, Harvey and his assistant. They will only work one four-hour shift per day. It takes 20 minutes to clean the mixing machine each day prior to starting a new lot of production.

1 Add the department and the two work centers used by this bottling process.

2 Establish the four-hour per day capacity. Where did you have to go to do this?

Menu Number/Name:

3 Set up an item record and process for beer (use 15.13). How did you indicate the three-day aging period?

4 What function allows you to enter the bottling time as units per hour?

Menu Number/Name:

CHAPTER 4

Product Change Control Activities

Business Issues

Individually, or in small groups, examine your company (or a company your instructor suggests) against the business issues discussed in the Pre-Setup Business Issues chapter of the Product Change Control training module.

Consider the following:

1. What are the business requirements for PCC?
2. Additional information you may need to gather in order to successfully set up Product Change Control for your company.
3. Define what the change control environment is at your company
4. What functions approve changes?
5. Do people approve manufacturing inspection?
6. Are component drawings and assembly drawings and procedures approved by the same or different functions?
7. Do you need multiple revisions to be active at the same time?
8. Do you support services as well as manufacturing environments?
9. What are the criteria by which you determine if an item document is changed to a new revision or issued a new part number?
10. Are there cost change or downward compatibility issues?
11. Is your proposal to change an authorization one step or two steps? (PCRs and PCOs)?

The purpose of this exercise is to help you focus on what is important for your company about Product Change Control.

Your instructor may ask you to list business requirements on an easel or white board to make it easier to share and review your findings with the whole class.

Setup

Print Existing ECOs

Instructions: In this exercise use ECO by ECO Number Report 13.13.3 to print the existing ECOs before enabling PCC.

1 In an environment where you have ECOs, print the ECO by ECO Report.

In a live database you would use this report to create new PCOs later.

For the purposes of these exercises you can print to WINDOW.

PCC Processes

Instructions: In this exercise you ensure that PCC is enabled for several processes.

1 Use Enable PCC Product Structure Maintenance 13.13.22 to enable PCC product structure maintenance.

2 Use Enable PCC Routing Maintenance 14.22 to enable PCC routing maintenance.

3 Use Enable PCC Item Spec Maintenance 19.1.22 to enable PCC item spec maintenance.

4 Use Enable PCC Formula Maintenance 15.22 to enable both Formulas and Processes.

Note Formula and Process changes are optional exercises. However, you must enable Formula Maintenance for PCC if you plan to do any of the optional formula or processing exercises in this training guide.

Routing Slips

Instructions: Use Routing Slip Maintenance 1.9.1.5 to set up a routing slip for PCOs.

1 Enter the following:

Routing Slip:	PCO-R1
Description:	PCO Routing Slip R1
Severity List:	PCO

2 Press GO until cursor returns to Routing Slip then click on Detail Maintenance and enter the following:

Group:	Eng/Apv	Mfg/Apv	Pln/Apv	Qual/Apv
Sequence:	0	0	0	0
Severity Level:	10	30	20	10

3 Place check marks in the following boxes for all of the groups:

Check:	Can Re-Route
Check:	Notify When Next

PCR Routing List

Instructions: Use Routing Slip Copy 1.9.1.7 to enter the following:

1 Copy Routing Slip: PCO-R1 To: PCR-R1.

2 Press GO until the cursor returns to the initial field.

3 Enter the following information in Routing Slip Maintenance 1.9.1.5:

Routing Slip:	PCR-R1
Description:	PCR Routing Slip R1

4 Press GO and select Detail Maintenance.

5 With your cursor in the Group field, press the down arrow until Mfg/Apv appears in the field.

6 Press the F5 Key (Confirm Delete).

7 Press the down arrow until Pln/Apv appears in the field.

8 Press the F5 Key (Confirm Delete).

9 Use the up and down arrow keys to verify that only Eng/Apv and Qual/Apv remain. Leave all values the same.

10 Exit function.

PCR/PCO Type Maintenance

Instructions: Use PCR/PCO Type Maintenance 1.9.1.9 to enter the following data:

Type:	PCO	PCR
Design Group:	Design	Design
Description:	PCO Document	PCR Document
Doc Type:	PCO	PCR
Prefix:	PCO	PCR
Routing Slip:	PCO-R1	PCR-R1
Distribution:	DIST	Design

PCC Control File

Instructions: Use the PCC Control File 1.9.24 to enter the following data in the indicated fields:

Auto Numbers:	Yes
Security:	No
PCO:	1000
PCR:	8000

Set Up Product Change Orders (PCOs)

Important The data used in these exercises may not be the same as the data shown in the screen captures in this lesson. You must have completed all the setup exercises before you can work on the processing exercises.

PCO With Item Changes

Instructions: In your Item Master there are three types of Batteries, 30-100, 30-1000, & 30-10000. They were used in several different product lines in the past and now you will consolidate them under all under the same product line. Your company procedures require you to route the changes through a PCO.

Use PCO Maintenance 1.9.2.13 to create a new PCO to route these proposed changes to the Item Master.

1 Let MFG/PRO assign the PCO number. The number will be assigned when you complete the Type and Design group fields and press Go.

2 Press Enter until your cursor is in the Type field and enter the following:

Type: PCO

Design Group: DESIGN

3 Write down the PCO number assigned for later reference: _____

4 Title and Reason fields are optional. Leave them blank, or create a simple description for this PCO:

Title: Change Product Line

Reason: All Batteries moving to Electronics

5 Press Go to continue past the header. Select Item File Maintenance and then choose Add/Modify/Delete PCO Item Files.

a Add items:

30-100	Rev B
30-1000	Rev B
30-10000	Rev B

b For each, set Comments to No.

c Change the Product Line on each to 2000.

d Verify the Item Type for each is = ELEC, and Group = ELECTRON.

6 When you return, choose Trailer Maintenance.

a Using the Mandatory field, assign an implementation date no later than the last day of next month.

b Disposition: UAI

7 Use PCR/PCO Detail Inquiry 1.9.2.8 to review your PCO to verify that your changes were all included.

PCO With Product Structure Changes

Instructions: The Nomad (TM) Solar Powered Cooling System (10-15001) uses a 44-110 automotive control unit. The current product structure assumes that there is no scrap involved in the control unit. Your recent experience shows a 5% scrap involved.

In this exercise, use PCO Maintenance 1.9.2.13 to create a new PCO to make this change.

1 Let MFG/PRO assign the PCO number.

a Assign Type = PCO, Design group = DESIGN

b Write down the PCO number assigned for later reference: _____

2 Title and Reason fields are optional. Leave them blank, or create a simple description for this PCO:

Title:	Add Scrap
Reason:	10-15001 to be modified Component 44-110 shows 5% scrap

3 Press Go to continue past the header. Choose Structure File Maintenance. From this menu select Copy Product Structure into PCO.

a Parent Item = 10-15001. Press Go.

b Use your arrow keys to select 44-110, press Enter to select the component. An asterisk appears when the component is selected. Press Go to continue.

4 Return and choose Structure File Maintenance and then PCR/PCO Detail Maintenance - Product Structures.

a When you arrow down, you should see that one record was copied into the PCO (Parent Item = 10-15001 and Component Item = 44-110). If you do not see this record, repeat step three above until the component is copied successfully.

b Deactivate should remain = No (Do not delete the component).

c Specify a 5% scrap. Accept all the remaining default fields. Press Go to accept your changes.

5 When you return, choose Trailer Maintenance.

a Using the Mandatory field, assign an implementation date no later than one month from today.

b Disposition: UAI

6 Use PCR/PCO Detail Inquiry 1.9.2.8 to review your PCO to be certain your changes were all included.

PCO With Routing Changes

Instructions: In this exercise, use PCO Maintenance 1.9.2.13 to modify the routing for the 44-110 Automotive Control Unit to add a standard inspection step.

1 Let MFG/PRO assign the PCO number.

a Assign Type = PCO, Design group = DESIGN

b Write down the PCO number assigned for later reference: _____

2 Title and Reason fields are optional. Leave them blank, or create a simple description for this PCO:

Title: Adding Rework

Reason: 44-110 Adding standard rework routing

3 Press Go to continue past the header.

4 Select Routing File Maintenance, then enter the following in PCR/PCO Detail Maintenance - Routing:

Routing Code:	44-110
Operation:	15
Standard Operation:	Rework
Milestone Operation:	No
Comments:	No

5 Save the record without adding any information to the trailer.

6 Use PCR/PCO Detail Inquiry 1.9.2.8 to review your PCO and verify that the changes were all included.

PCO With Item Spec Changes

Instructions: Engineering found that the inspection procedure for 10-15001 is not strict enough. In this exercise, use PCO Maintenance 1.9.2.13 to modify the Quality Management specifications to make the inspection use stricter standards.

1 Let MFG/PRO assign the PCO number.

a Assign Type = PCO, Design group = DESIGN

b Write down the PCO number assigned for later reference: _____

2 Title and Reason fields are optional. Leave them blank, or create a simple description for this PCO:

Title:	Tighter Rework
Reason:	Modifying Item Specs for 10-15001

3 Press Go to continue past the header. Choose Item Specification Maintenance. From this menu select Copy Item Specification from Quality Module.

a Item Number = 10-15001; Routing Code = 10-15000

b Press Enter to select each sequence number (an asterisk should appear next to each sequence). Press Go and space bar to continue.

4 Return and choose Item Specification Maintenance, then PCR/PCO Detail Maintenance - Item Specification. Arrow down to modify each of the three records copied in the last step.

a For Test Sequence 1, Width, change the specifications to a range of 14 | 14.10.

b For Test Sequence 2, Height, change the range to 3.75 | 3.85.

c For Test Sequence 3, Depth, change the range to 11.95 | 12.05.

5 Save the record without adding any information to the trailer

6 Use PCR/PCO Detail Inquiry 1.9.2.8 to review your PCO and verify that your changes were all included.

PCO With Formula Changes (optional)

Instructions: Koolaire (TM) Coolant Standard, Scented (90-100) needs to have the perfume reduced in the formula because the supplier has started making the perfume in stronger concentration.

In this exercise, use PCO Maintenance 1.9.2.13 to create a PCO to indicate the reduction of one component and the increase of other components by percentage.

1 Let MFG/PRO assign the PCO number.

a Assign Type = PCO, Design group = DESIGN

b Write down the PCO number assigned for later reference: _____

2 Title and Reason fields are optional. Leave them blank, or create a simple description for this PCO:

Title:	Formula Change
Reason:	Modifying 90-100 to use less 90-2000 Concentration strength from supplier increased

3 Press Go to continue past the header. Choose Formula File Maintenance. From this menu select Copy Formula into PCO.

a Parent Item = 90-100

b Press Enter to select components 90-2000 and 90-4000 (an asterisk should appear next to each sequence). Press Go to continue.

4 Return and choose Formula File Maintenance, then PCR/PCO Detail Maintenance - Formulas. Arrow down to access both records copies in the previous step.

a For 90-2000, change the Batch Percent from 10 to 8. Press Go. The Quantity Per changes automatically.

b For 90-4000, change the Batch Percent from 75 to 77. Press Go. The Quantity Per changes automatically.

5 Save the record without adding any information to the trailer.

6 Use PCR/PCO Detail Inquiry 1.9.2.8 to review your PCO and verify that your changes were all included.

PCO With Process Changes (optional)

Instructions: The plastic bottle molding process has a scrap factor that has never been figured into the process. Select the process operation for the 1-liter Plastic Bottle, 88-300, and use PCO Maintenance 1.9.2.13 to create a PCO for a yield of only 98%.

1 Let MFG/PRO assign the PCO number.

a Assign Type = PCO, Design group = DESIGN

b Write down the PCO number assigned for later reference: _____

2 Title and Reason fields are optional. Leave them blank, or create a simple description for this PCO:

Title:	Process Change
Reason:	Modifying 88-300 to change yield Scrap factor of 2%

3 Press Go to continue past the header. Choose Process File Maintenance, then Copy Processes to PCR/PCO.

a Routing Code = 88-300

b Press Enter to select process 10 (an asterisk should appear next to the process). Press Go to continue.

4 Return and choose Process File Maintenance, then PCR/PCO Detail Maintenance - Processes. Arrow down to modify the record copies in the previous step.

a For 88-300 operation 10, change the Yield Percent to 98%. Press Go.

5 Save the record without adding any information to the trailer.

6 Use PCR/PCO Detail Inquiry 1.9.2.8 to review your PCO and verify that your changes were all included.

Check Status and Print PCOs

Instructions: In each of the exercises above you reviewed individual PCOs with a Detail Inquiry.

1 In this exercise, use PCR/PCO Status Browse 1.9.11 to review the status of all the PCOs created in the exercises above.

2 Use Print PCR/PCO 1.9.9.1 to print the PCOs you created. Leave the PCO Number field blank and enter the following:

Pre-submission:	Yes
All other status fields:	No
PCO/PCR:	PCO
Output device:	Window

Route PCOs for Approval

Instructions: Submit your first three PCOs to start the routing and approval process, using Route PCO for Approval 1.9.2.16.

1 Select the first three PCOs you created in these exercises (refer to the PCO numbers you recorded). Leave the number field blank and leave Unsubmit Only = Yes. This will filter for just the unsubmitted PCOs.

a Select a PCO in the first frame, press Enter.

b When it appears in the second frame, verify Sbmt = Yes. Press Go to submit.

2 Use PCR/PCO Status Browse 1.9.11 to review your PCOs to verify that their status changed. You should see:

three records with Status:	Submit
the remaining PCOs with Status:	Blank

Approve PCOs

Instructions: Use PCR/PCO Approval 1.9.6.1 to approve the first two PCOs submitted in the last exercise.

1 Leave the number field blank, select DocType = PCO, and review Unsigned Only = Yes. Select just the first two PCOs submitted. Mark each APPROVED.

2 Use PCR/PCO Status Browse 1.9.11 to review your PCOs and verify that their status changed. You should see:

two PCOs with Status:	Approved
one PCO with Status:	Submit
the remaining PCOs with Status:	Blank

Release and Incorporate PCO

Instructions: Use Release and Distribution 1.9.7.1 to release and distribute your first PCO. Incorporate these changes into MFG/PRO for planning consideration.

1 Select your first PCO for release.

- **a** Leave the Number field blank
- **b** Type = PCO
- **c** Unreleased Only = Yes

2 Then select the first PCO in the top frame to copy to the bottom frame. Verify Rels = Yes and press Go to release (leave Batch ID blank). You should see a message that the PCO was distributed successfully.

3 Use PCR/PCO Status Browse 1.9.11 to review your PCOs and verify the PCO that was released and distributed. You should now see Status = Released for your first PCO.

4 Use Incorporation Selection 1.9.7.4 to select your released PCO for incorporation. Leave the Number field blank, Type=PCO, and Unincorporated Only = Yes.

- **a** Select the PCO in the first frame to bring it into the bottom frame. Assign the Eff Date = today. Press Go to continue.

5 Use Incorporation 1.9.7.5 to incorporate all PCOs with effective dates for today.

6 Use PCR/PCO Status Browse 1.9.11 to review your PCOs and verify the latest status change. You should now see Status = Incorp for your first PCO.

Implement PCO

Instructions: Use Implementation 1.9.7.13 to implement your incorporated PCO fully into MFG/PRO.

1 Run the implementation process.

2 Use PCR/PCO Status Browse 1.9.11 to review your PCOs to verify the latest status change. You should now see Status = Closed for your first PCO since it has completed the full processing cycle: Created/Routed/Approved/ Distributed/Incorporated/Implemented (Closed).

Product Change Requests (PCRs)

You must have completed all the setup exercises before you can work on the processing exercises.

Create PCR With Where-As Changes

Instructions: You received a request to make black cases in place of your existing grey cases. To analyze the feasibility of this product change, you need a new colorant similar to 88-6000 Grey Colorant, and you need Where-As replacements to substitute the new colorant.

In this exercise use PCR Maintenance 1.9.2.1 to create a PCR to evaluate and approve these changes before converting them to PCOs.

1 Let MFG/PRO assign the PCR number. The number will be assigned when you complete the Type and Design group fields and press Go.

- **a** Assign Type = PCR, Design group = DESIGN
- **b** Notice the different numbering from the PCOs in the last chapter.
- **c** Write down the PCO number assigned for later reference: _____

2 Title and Reason fields are optional. Leave them blank, or create a simple description for this PCR:

Title:	New Colorant
Reason:	New Item 88-8000 Black Colorant to Replace 88-6000

3 Press Go to continue past the header. Choose Item File Maintenance, then select Add, Modify, Delete PCR Item Files.

- **a** Add the item record for 88-6000 Grey Colorant to your PCR.
- **b** End Product = Yes.
- **c** Comments = Yes. Add a comment, “Being replaced by Black Colorant.”
- **d** Exit the PCR and print the record, or review the Detail Inquiry and write down the Item Data information about 88-6000. You need it to create the new item 88-8000. Return to PCR Maintenance when you have the 88-6000 information.

4 Choose Item File Maintenance, then select Direct Item Master Access.

a Add a new item 88-8000 BLACK COLORANT. Be sure to use the same Product Line, Unit of Measure, Status Code, and all other Item Data codes as 88-6000. Refer back to your copied record for accuracy.

5 Return and choose Item File Maintenance, then Add, Modify, Delete PCR Files.

a In the last step you added the item to the Item Master but not to the PCR. Add the new item record for 88-8000 Black Colorant to the PCR:

End product: No

Comments: No

6 Return and choose Structure File Maintenance. Then select Copy Where Used into PCR.

a Component Item = 88-6000

b Select each product structure by pressing Enter.

An asterisk appears next to each parent item number.

c Press Go to save the records.

7 Select Structure File Maintenance and then Replace Product Structure Component.

a Component Item = 88-6000

b Replace with Item = 88-8000, Multiplier = 1.0 (a one-for-one replacement).

c Press Go, then End to Continue.

d Please Confirm Update = Yes.

8 Choose Structure File Maintenance and then PCR/PCO Detail Maintenance - Product Structures.

a Review the records created with this copy procedure.

b Arrow down to scroll through each record.

You should see that the product structure records include the old item number 88-6000 with Deactivate = Yes and the new item number 88-8000 with Deactivate = No.

9 Save the record without adding any information to the trailer.

10 Use PCR/PCO Detail Inquiry 1.9.2.8 to review your PCR and verify that your changes were all included. Note the double records for product structure changes.

Route PCR for Approval

Instructions: In this exercise, use Route PCR for Approval 1.9.2.4 to route your PCR for approval.

1 Allow MFG/PRO to automatically select the PCR available for submittal.

a Doc Type = PCR and Unsubmt Only = Yes. Press Go to continue.

b Press Enter to accept the PCR in the first frame. Sbmt = Yes in the second frame. Press Go.

2 Use PCR/PCO Status Browse 1.9.11 to review your PCR to see the status change:

Status: Submit

Approve PCR

Instructions: In this exercise, use PCR/PCO Approval 1.9.6.1 to approve your PCR.

1 Allow MFG/PRO to automatically select the PCR available for approval.

a Doc Type = PCR, Appr Group = Eng/Apv, and Unsigned Only = Yes. Press Go to continue.

b Press Enter to accept the PCR in the first frame. Appr = Yes in the second frame. Press Go.

2 Use PCR/PCO Status Browse 1.9.11 to review your PCR to see the status change:

Status: Approved

Close PCR to PCO

Instructions: In this exercise, use PCO Maintenance 1.9.2.13 to close the PCR to a new PCO. You create the PCO and then use Close PCR to PCO.

1 Your company requires a new PCO that will only contain the contents of this PCR.

a Create a new PCO. Allow MFG/PRO to automatically assign the next number. Type = PCO, Design Group = DESIGN.

b Write down the PCO number assigned for later reference: _____

c Finish the header of the new PCO and exit without adding any changes or trailer information.

Title: New Colorant Applied

Reason: PCR Changes Approved
Production Order for Black Colorant

2 Return to PCR Maintenance 1.9.2.1 and select your Black Colorant PCR.

3 Press Go until you move past the header.

4 Select PCO/PCR Function Maintenance. Then choose Close PCR to PCO.

a Assign the PCO number you recorded in the previous step. Verify that the To: document is a PCO document type.

b Affirm copying the PCR data to the PCO. Ignore the message Warning: Target Exists; Duplicated Records Will Not Copy. Assign Continue? = Yes.

c Further Detail changes to the PCR are not allowed. At this point you can modify the trailer of your PCR. For the purposes of these exercises, there are no trailer modifications.

5 Use PCR/PCO Status Browse 1.9.11 to review your PCR and PCO Status. The old PCR should show Status = Closed. The new PCO should show Status = blank. The PCO is now ready for routing.

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Training Guide: MFG/PRO For Engineers: Activities Guide
Item number: 70-2829A

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