QAD Enterprise Applications
Standard & Enterprise Edition

Training Guide

Shop Floor Control

70-3026D
QAD 2011 Standard & Enterprise Edition
Lab: Enterprise Edition 2011 - Addons r02 - Training
Workspace: 10USA > 10USACO
April 2011

ShopFloorControl_TG_v2011SE_EE.pdf/njm/hes

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Contents

About This Course

Course Description

The Shop Floor Control training guide for QAD Enterprise Applications is designed to cover the basics of preparing to implement the Shop Floor Control module in QAD Enterprise Applications. The course includes:

- An introduction to the Shop Floor Control module
- An overview of key business issues
- Setting up the Shop Floor Control module
- Operating the Shop Floor Control module
- Activities and exercises

Course Objectives

Upon completion of this course participants will be able to design, implement, and efficiently use the Shop Floor Control module for QAD Enterprise Applications in their respective organizations.

Course Benefits

- Reduce the amount of WIP inventory.
- Increase delivery performance of work orders
- Identify capacity issues.
- Effectively manage the work orders costs of material, labor and burden.
- Correct administrative errors.
- Effectively manage the scrap, rework, and rejects.
- Provide management with feedback reports.

Audience

- Members of implementation teams
- Manufacturing managers and key users
- Shop Floor Supervisors
- Manufacturing Planners/Expediters

Prerequisites

- *Shop Floor Control is taught in conjunction with Work Orders.*
- Basic knowledge of:
  - QAD Enterprise Applications as it is used in the business
  - The manufacturing industry in general

Note Students that are unfamiliar with QAD Enterprise Applications should read the User Interface Guide before attending this class.

Course Credit & Scheduling

This course is valid for 4 credit hours. This course is typically taught in one-half day.

Virtual Environment Information

The hands-on exercises in this book should be used with the Enterprise Edition 2011 - Addons r02 - Training environment, in the 10USA > 10USACO workspace.

QAD Web Resources

From QAD's main site, you can access QAD's Learning or Support sites.

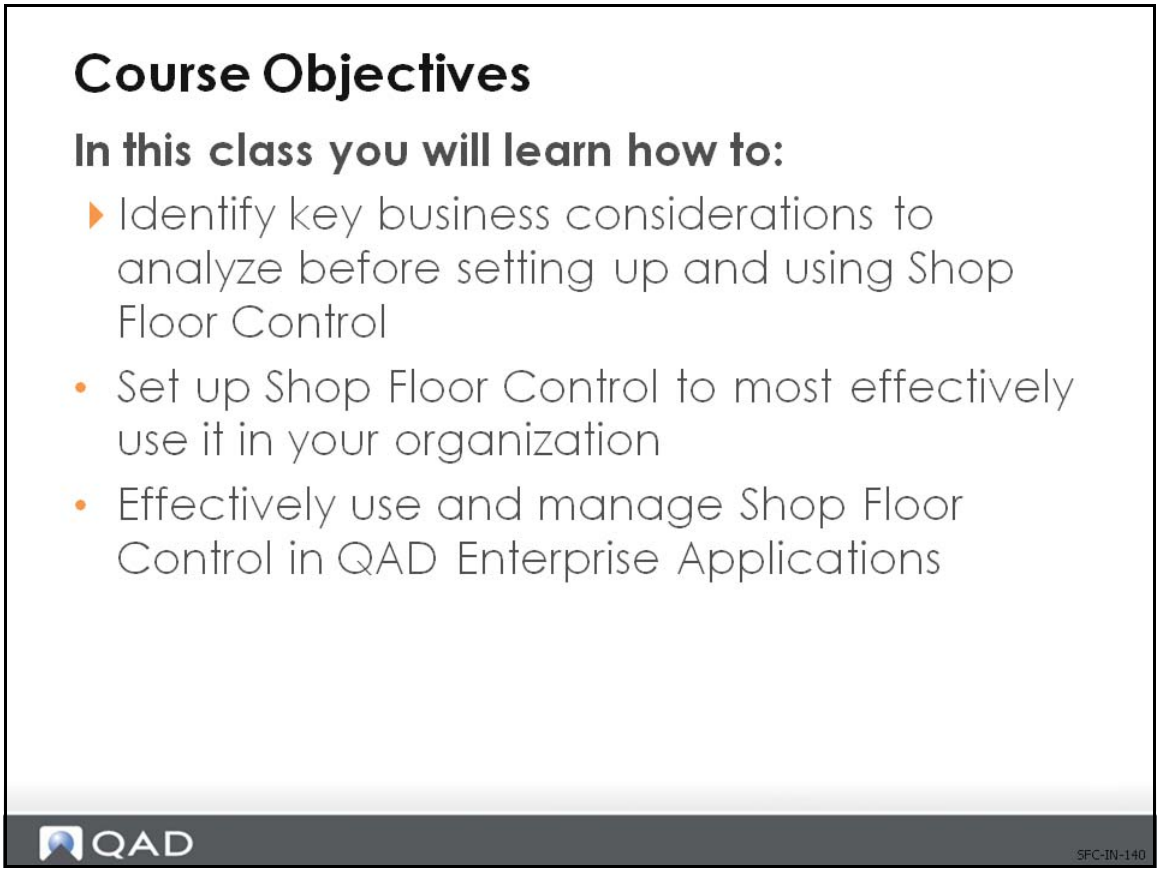
http://www.qad.com/

Chapter 1

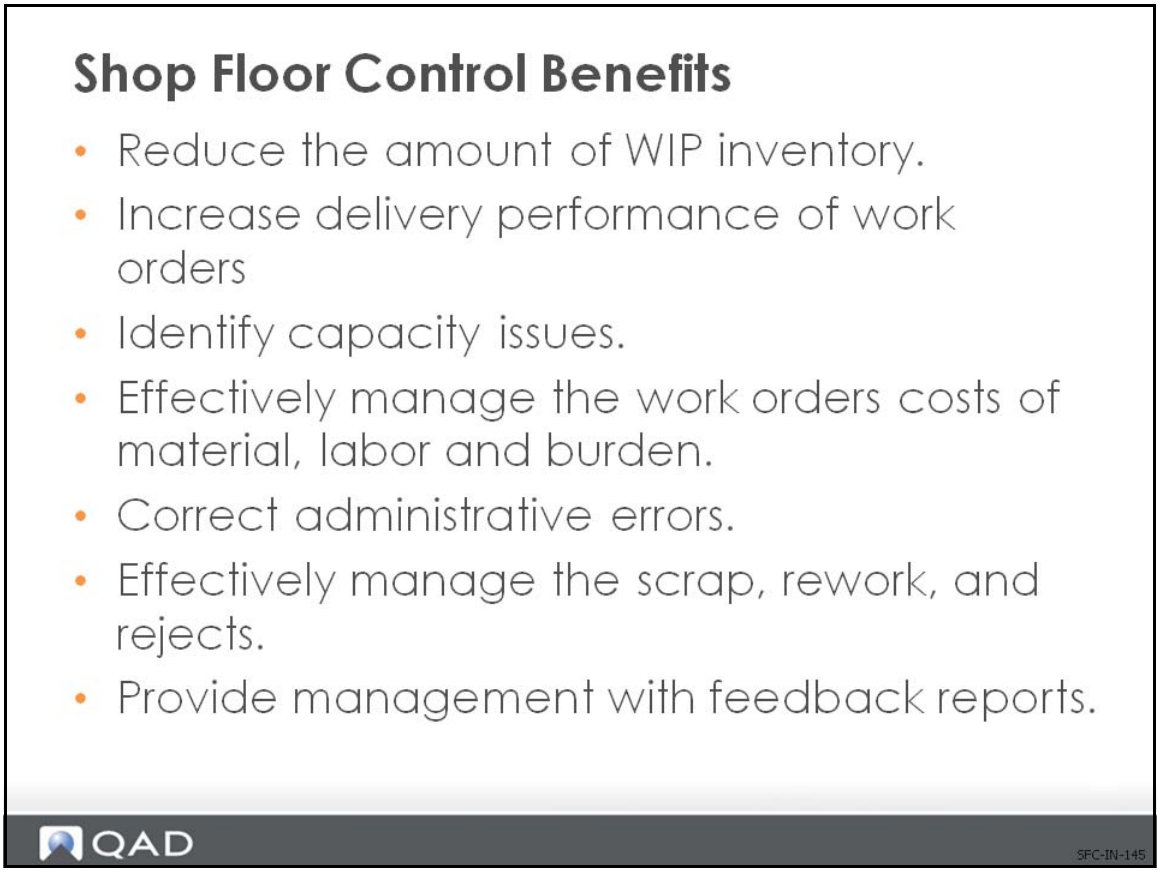
Introduction to Shop Floor Control

Course Overview

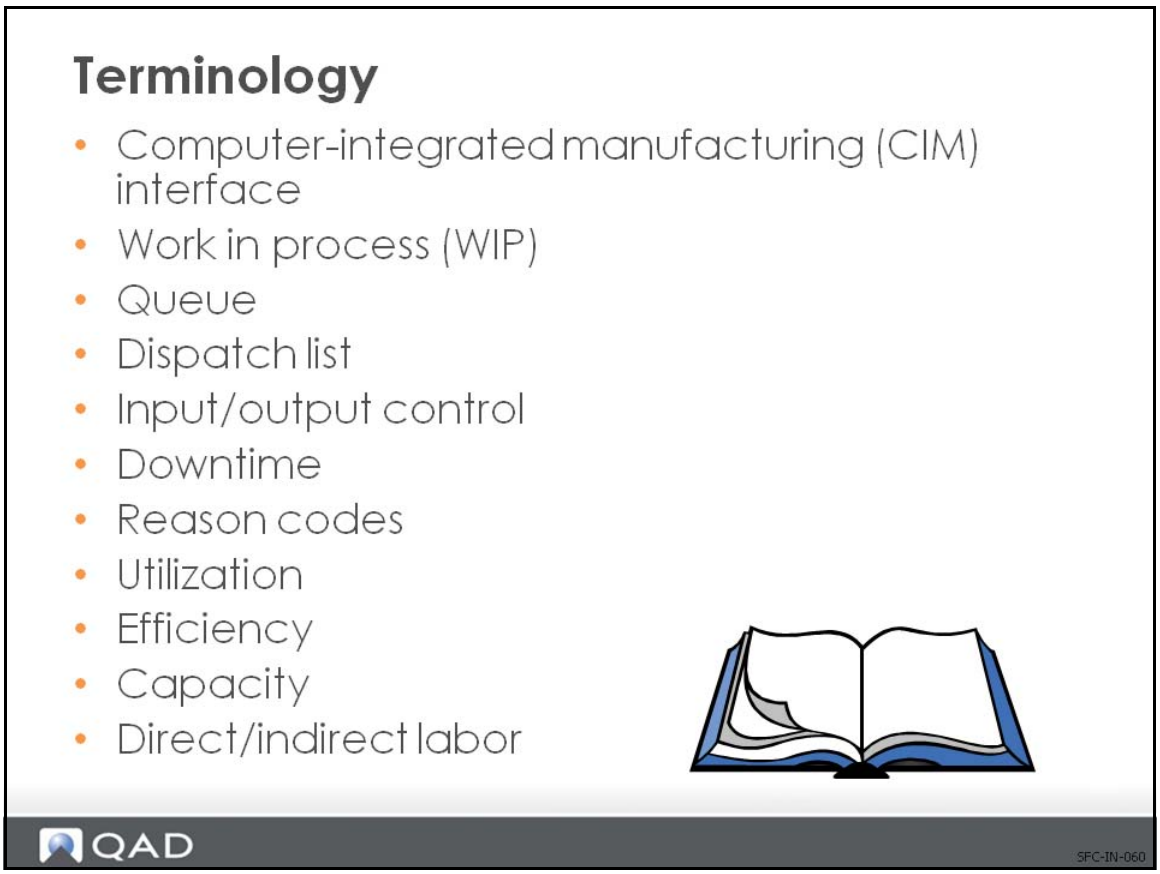
Course Objectives



Course Benefits



Terminology



Computer Integrated Manufacturing (CIM) Interface

The CIM interface takes import transactions from an external file or system and loads them into QAD Enterprise Applications.

Work in Process (WIP)

WIP indicates a product in various stages of completion throughout the plant. Stages include raw material released for manufacturing up to completely processed material awaiting final inspection and acceptance as finished product.

Queue

Can apply to any of the following:

a. A waiting area
b. The time work normally waits at a work center before the operations begin
c. A holding area for calls, call quotes, and service requests before the next event takes place in their life cycle

Dispatch List

A dispatch list is a listing of all manufacturing orders ranked in relative priority. The list contains information of priority, location, quantity, and the capacity requirements of the order by operation.

Dispatch lists are normally generated daily and broken down by work center.

Input/Output Control

Input/output control is a technique for capacity control where actual output from a work center is compared with the planned output developed by capacity requirements planning (CRP). Input is also monitored to see if it corresponds to plan and is adequate for the work center to meet its capacity requirements.

Downtime

Downtime is time when a resource is scheduled for operation but is not producing for reasons, such as maintenance, repair or setup.

Reason Code

In the Sales Quotes, Repetitive, and Shop Floor Control modules, a reason code is a code that categorizes or describes a transaction.

In the Product Change Control module, reason codes are user-defined and specify severity levels related to approval of change documents.

Utilization

Utilization is a measure of how well a resource is being used to produce goods or services. It compares actual time used to available time. Utilization is the ratio of time available for work/time used for work expressed as a percentage

Efficiency

The relationship between the planned standard time and actual time charged to the task. Efficiency is calculated by dividing the standard hours earned by the actual direct labor hours. Efficiency may be more than 100%.

Capacity

Capacity is the maximum work load for a work center, machine, and so forth.

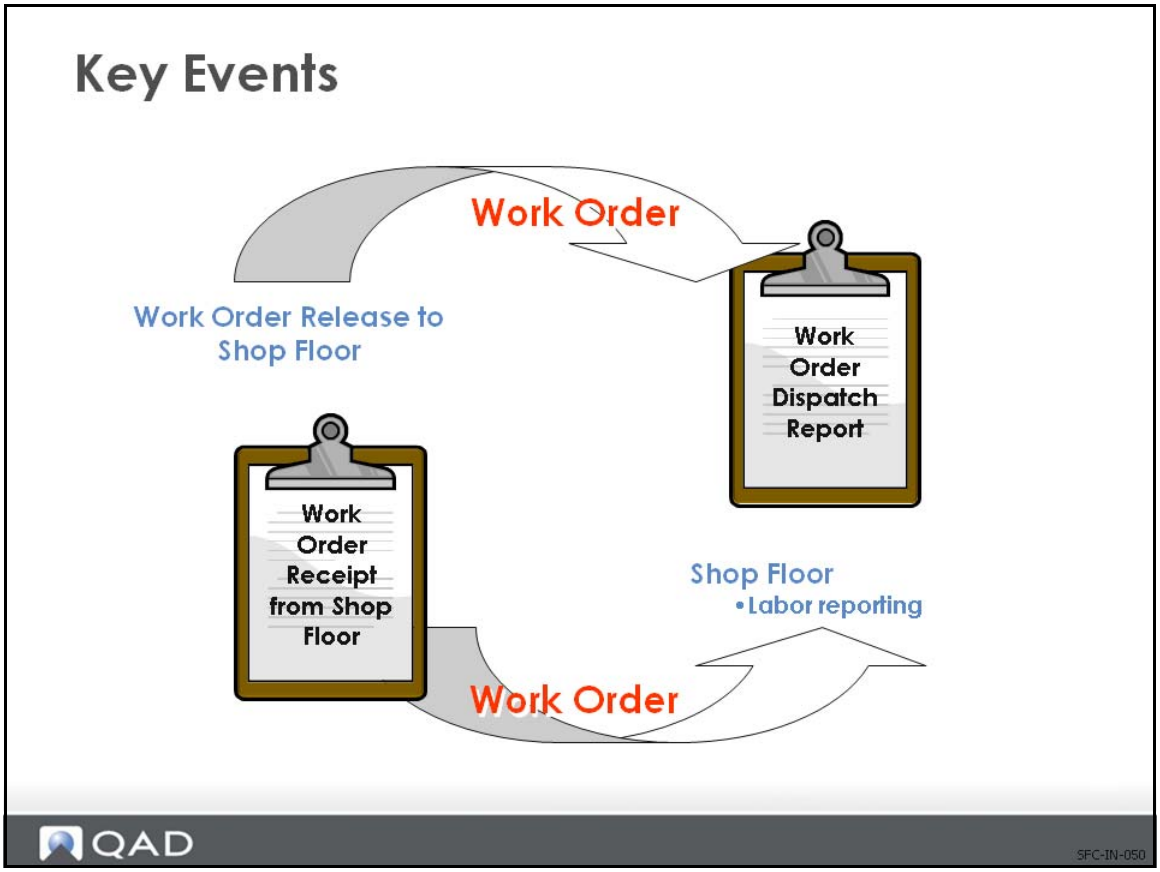
Direct Labor

Direct labor is labor specifically applied to the product being manufactured or utilized in the performance of the service.

Indirect Labor

Indirect labor is the work necessary to support production without being related to the production of a specific item or product (meetings, for example).

Shop Floor Control Defined

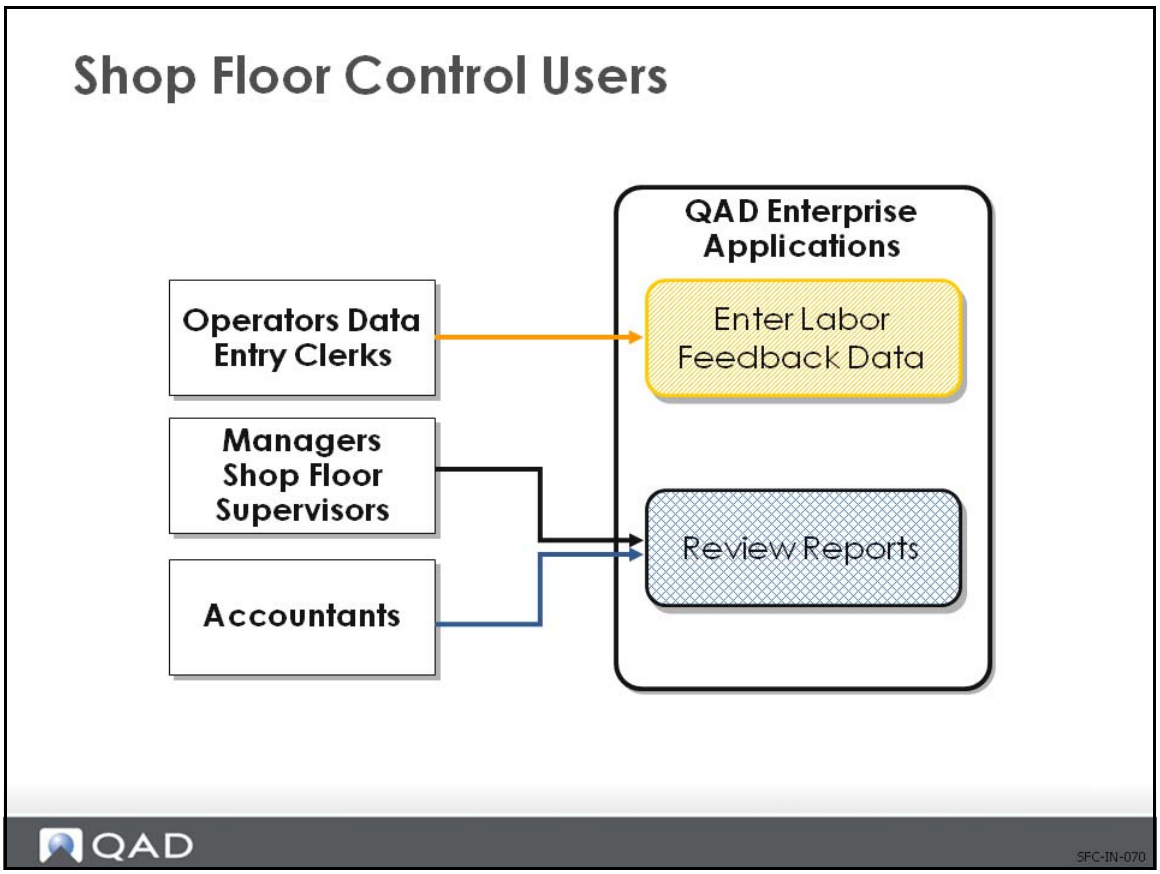


Shop Floor Control is a system for using data from the shop floor to maintain and communicate status information on shop (manufacturing) orders and work centers. (Source: APICS Dictionary)

- Use Shop Floor Control (SFC) when management of production priorities requires work order operations visibility and/or when labor costs are a large part of total production costs
  - When these are true, it is also likely that products have many operations or long lead times, work center queues are relatively long, and labor costs and variances need to be related to products and work centers

The SFC module works only with the Work Order module.

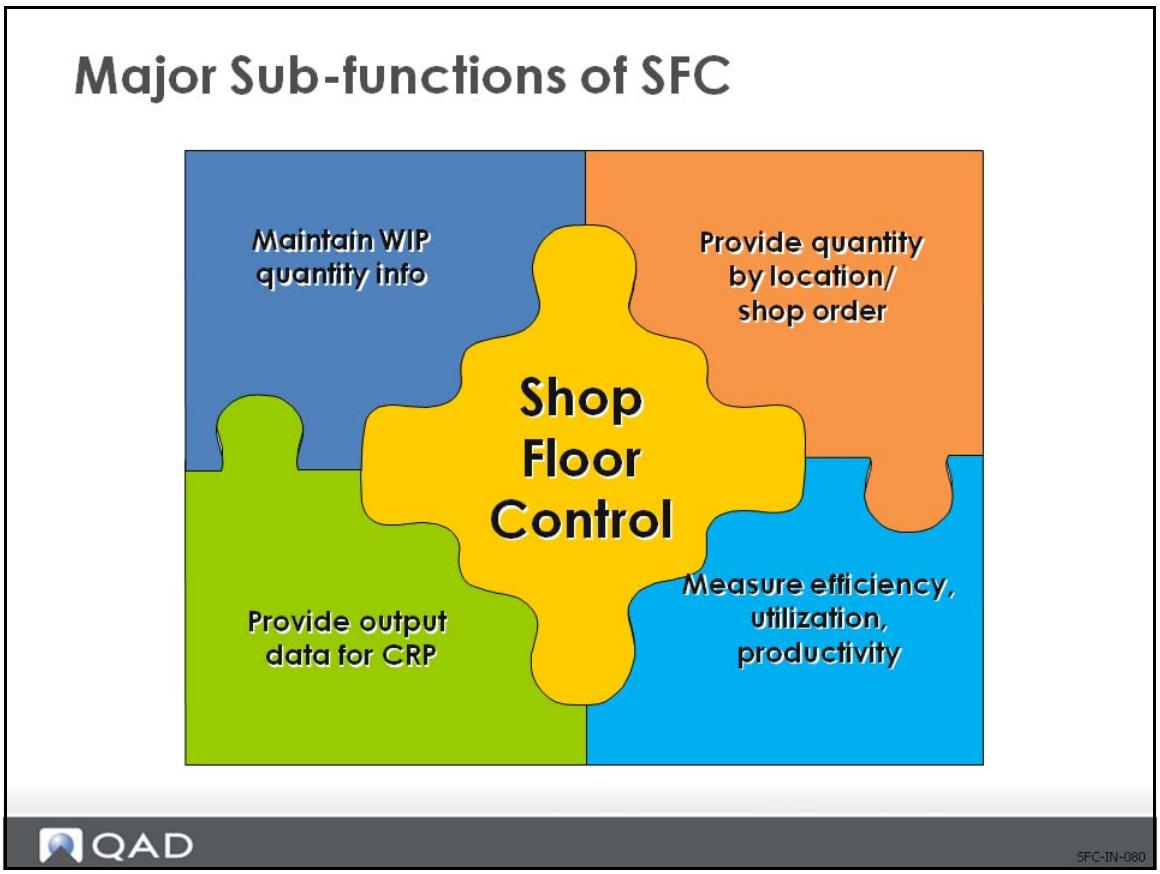
Shop Floor Control Users



The Shop Floor Control module is used by managers, shop floor supervisors, accountants, data entry clerks, and operators.

- Defining specific SFC users depends upon the primary business reason for using SFC – whether it is to track:
  - Labor time
  - Productivity
  - WIP

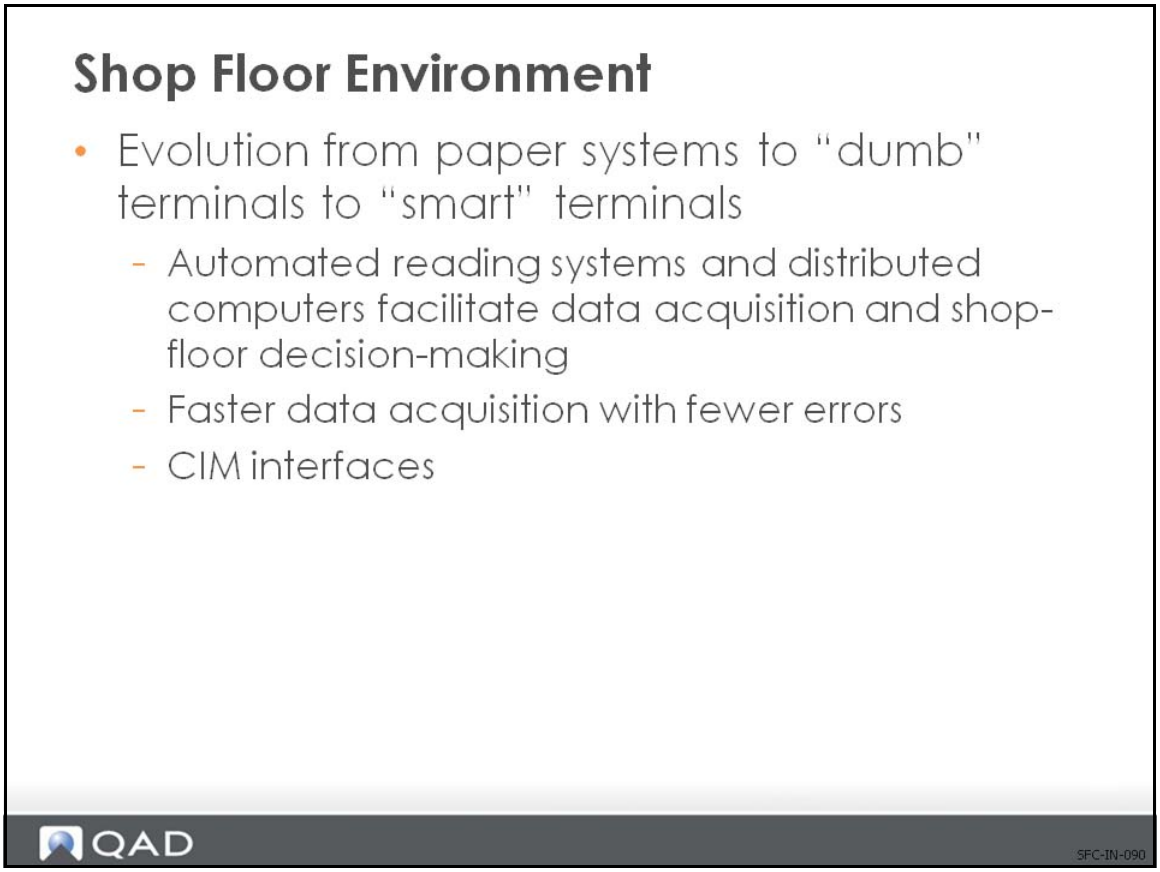
Major Sub-functions of SFC



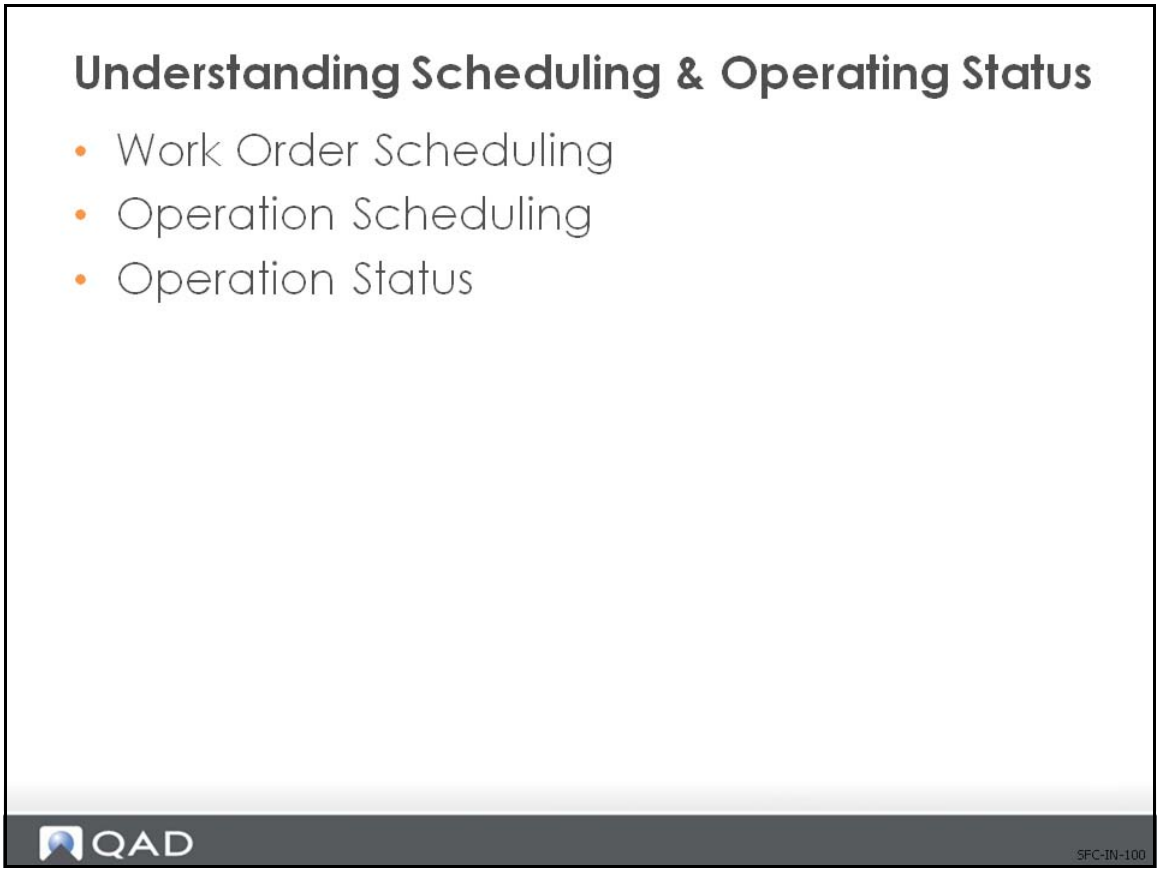
- Maintain WIP quantity information
- Provide quantity by location by shop order for WIP inventory and accounting purposes
- Measure of efficiency, utilization, and productivity of the work force and machines
- Provide actual output data for capacity control purposes

(Source: APICS Dictionary)

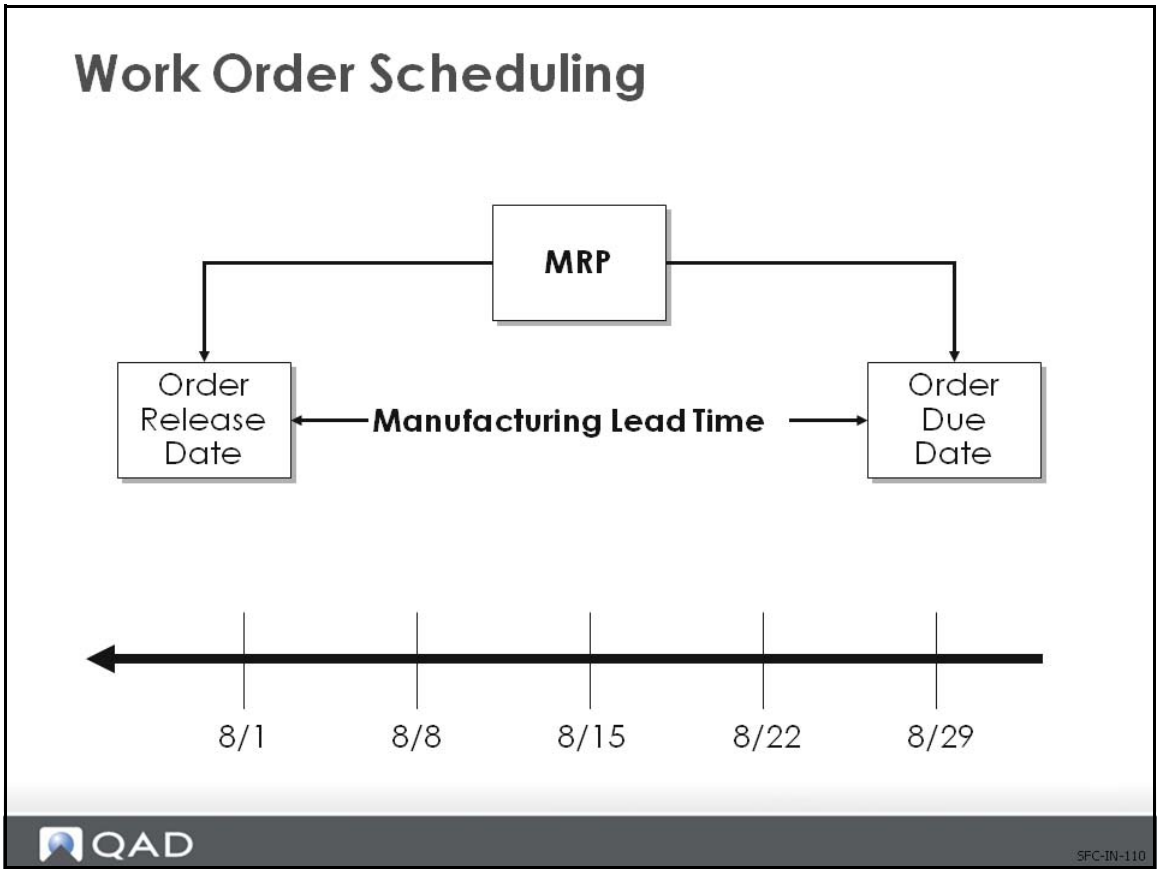
Shop Floor Environment



Understanding Scheduling and Operation Status



Work Order Scheduling



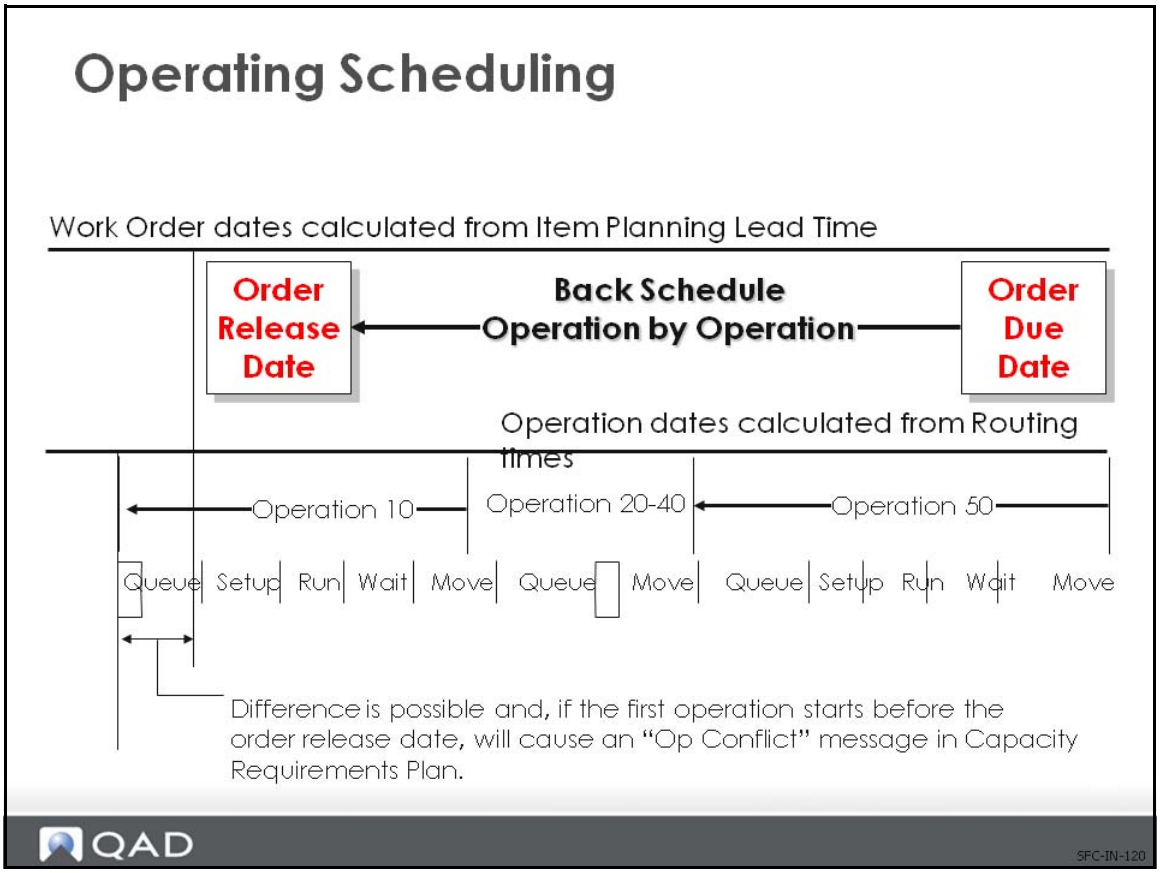
All planned work orders are automatically scheduled by MRP with respect to their release and due dates.

Backward Scheduling Method

MRP automatically calculates the planned order release date from the order due date. To determine the release date, QAD Enterprise Applications uses the manufacturing lead time to offset the number of shop days needed prior to the due date. The shop calendar is used to define the work week and identifies both shop and nonwork days. This is a backward scheduling method. From a planning perspective, it is critical to ensure that the lead times are accurate and that the planning horizon is sufficient in length to cover the longest lead time item.

An important element of backward scheduling is the standard order quantity specified in the Item Planning Data. This value is used during the lead time roll-up process. Thus the manufacturing lead time (displayed in Item Planning Maintenance) is based on the time required to make the standard order quantity.

Operation Scheduling



Back Scheduling

Work order operations are back scheduled from the MRP order due date. Back scheduling uses the standard operation setup, run, and move times along with work center queue and wait times. Operation start and end dates can be manually changed by the scheduler; however, these will revert if CRP is recalculated.

You can change operation time elements to increase or decrease operation times using Work Order Routing Maintenance.

Operation vs Order Dates

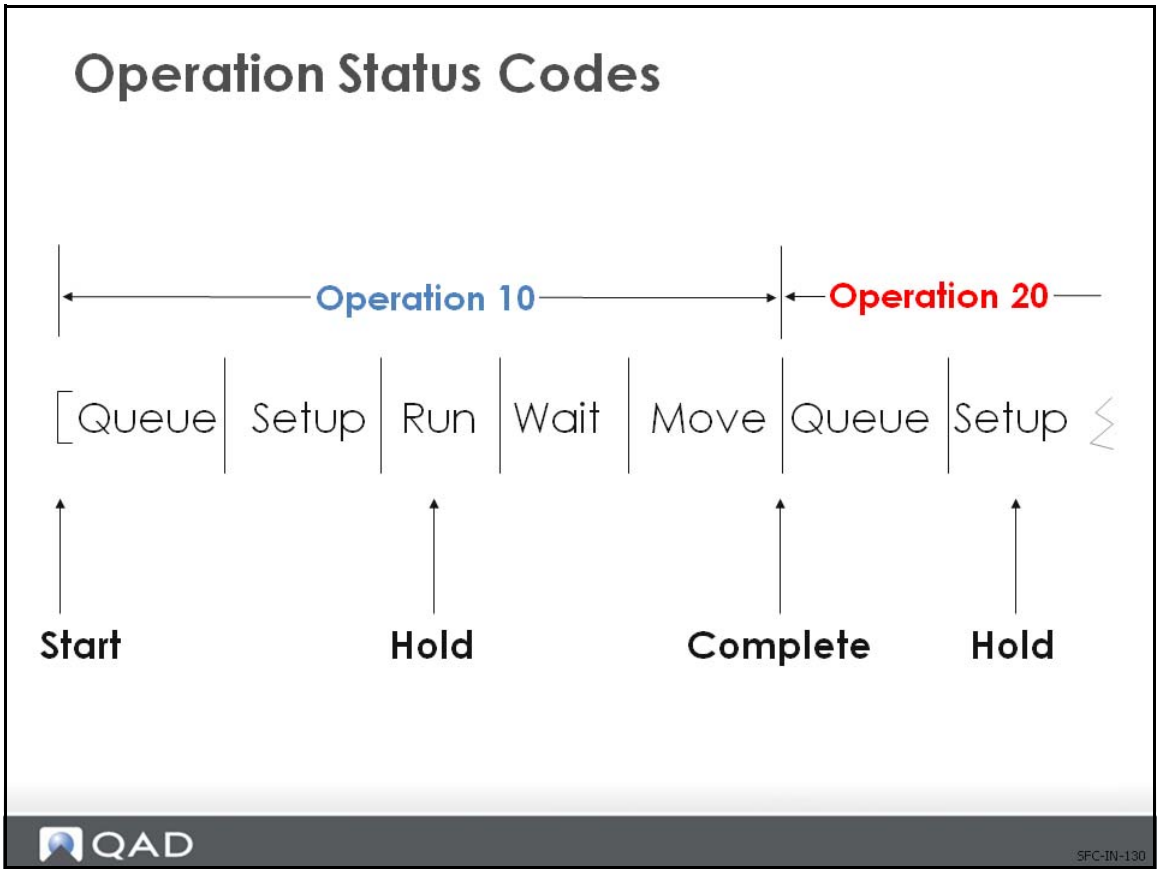
The work order release date is created by MRP by back scheduling from the order due date using manufacturing lead time. Because work order operations use routing times, order quantities much greater than the standard order quantity on the item master can push the first operation start date out past the order release date.

If the operation start date is prior to the order start date, a warning message of "Op Conflict" (operation conflict) is generated in the Capacity Requirements Planning (CRP) recalculation report.

Overlap Operations

Operation overlap is considered by the scheduling algorithm. Overlap specifies the number of items that must be completed before the next operation can begin. The overlap quantity can be specified in Routing Maintenance.

Operation Status Codes



Operation status codes are used to indicate the detailed status of an individual operation. The status codes can be entered manually using Work Order Routing Maintenance or automatically set when the Shop Floor Control Labor Feedback Transactions are used.

QAD Enterprise Applications identifies the following status codes:

Q =	Queues
S =	Setup
R =	Running
H =	Hold
C =	Complete

The first operation can be set to status Queue automatically upon releasing the work order if the Move Next Operation field in the Shop Floor Control File is set to Yes. Succeeding operations can be set to Queue automatically when the previous operation is reported as Complete.

Review Questions

1 Does Shop Floor Control work with Repetitive or Advanced Repetitive?

2 Shop Floor Control tracks what key elements?

3 What is a queue? How does MRP use queues?

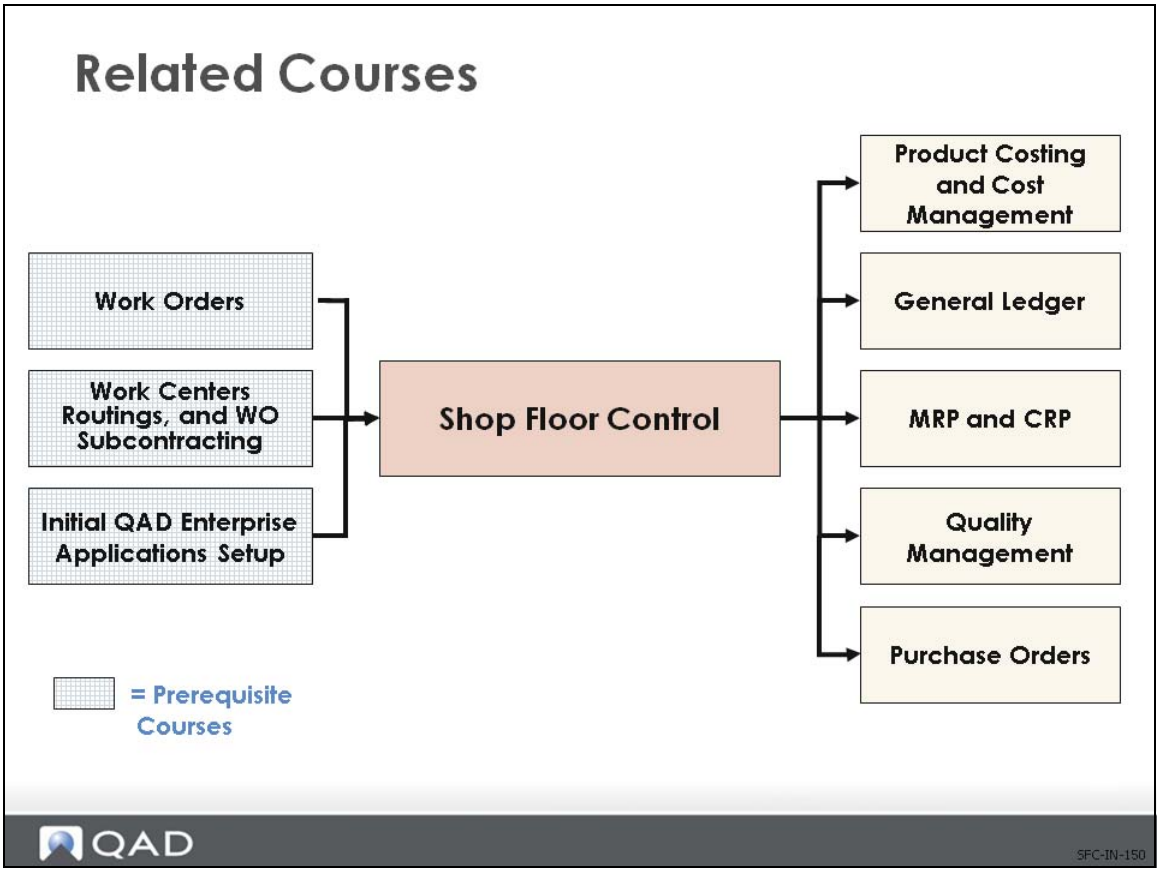
Answers to Review Questions

1 No, they have their own reporting transactions

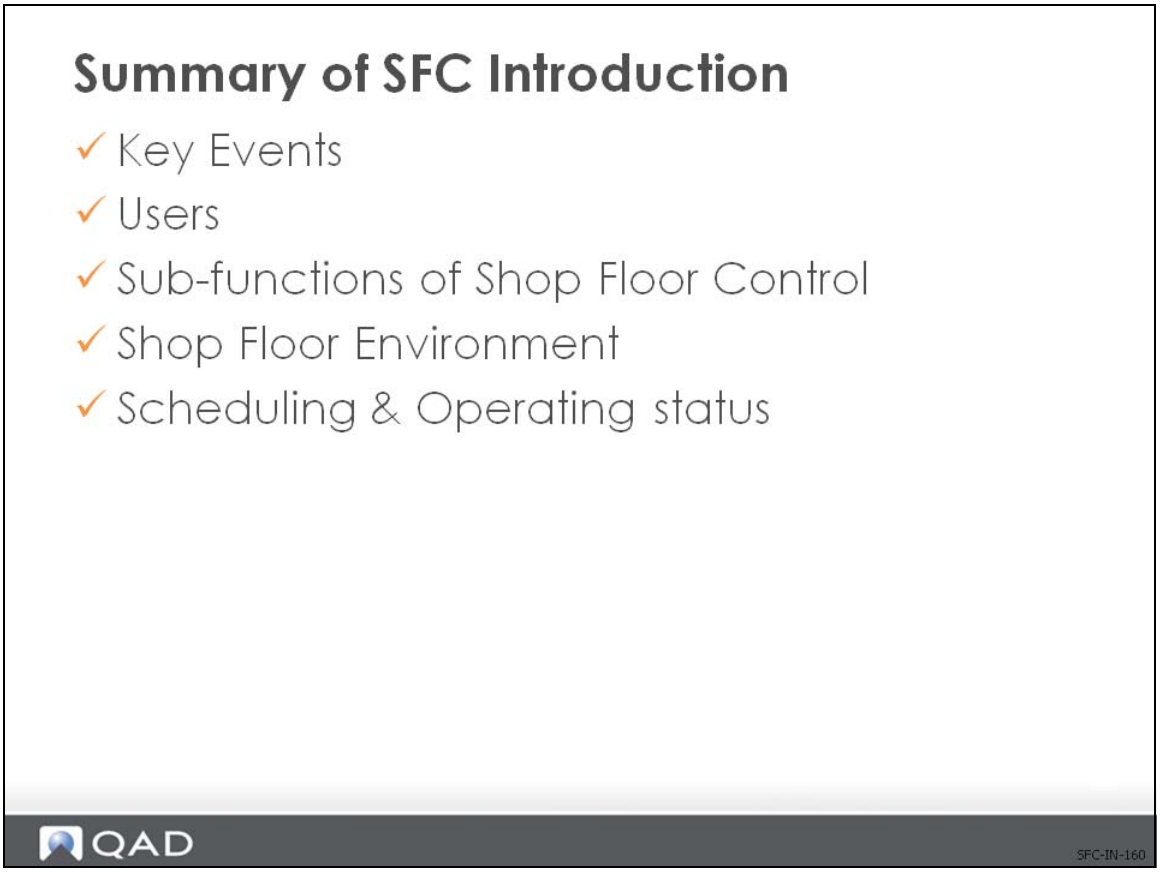
2 WIP, Labor, Productivity

3 A queue is the workload at a work center waiting to be worked on. Queue time in hours is an element of lead time used by MRP to calculate an order start date

Related Courses



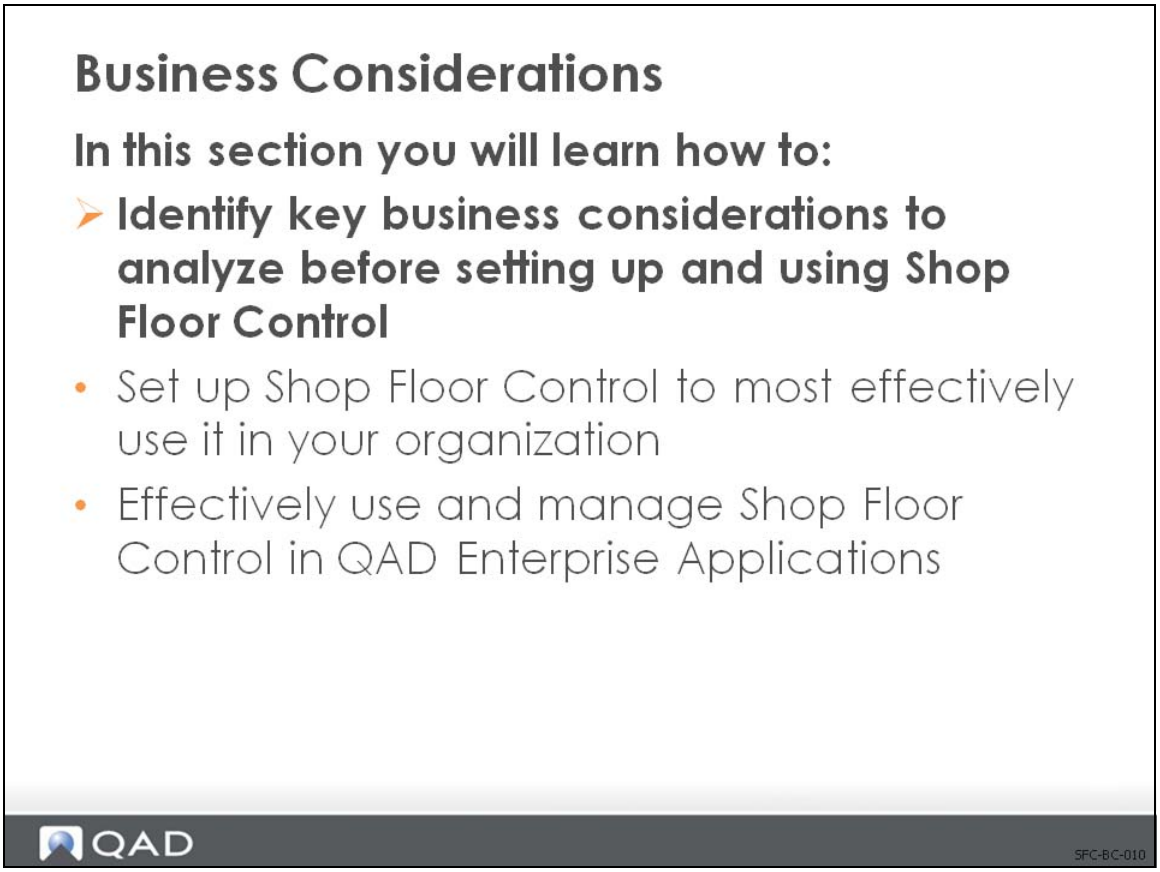
Summary


Summary of SFC Introduction
✓ Key Events
✓ Users
✓ Sub-functions of Shop Floor Control
✓ Shop Floor Environment
✓ Scheduling & Operating status
QAD
SFC-IN-160

Chapter 2

Business Considerations

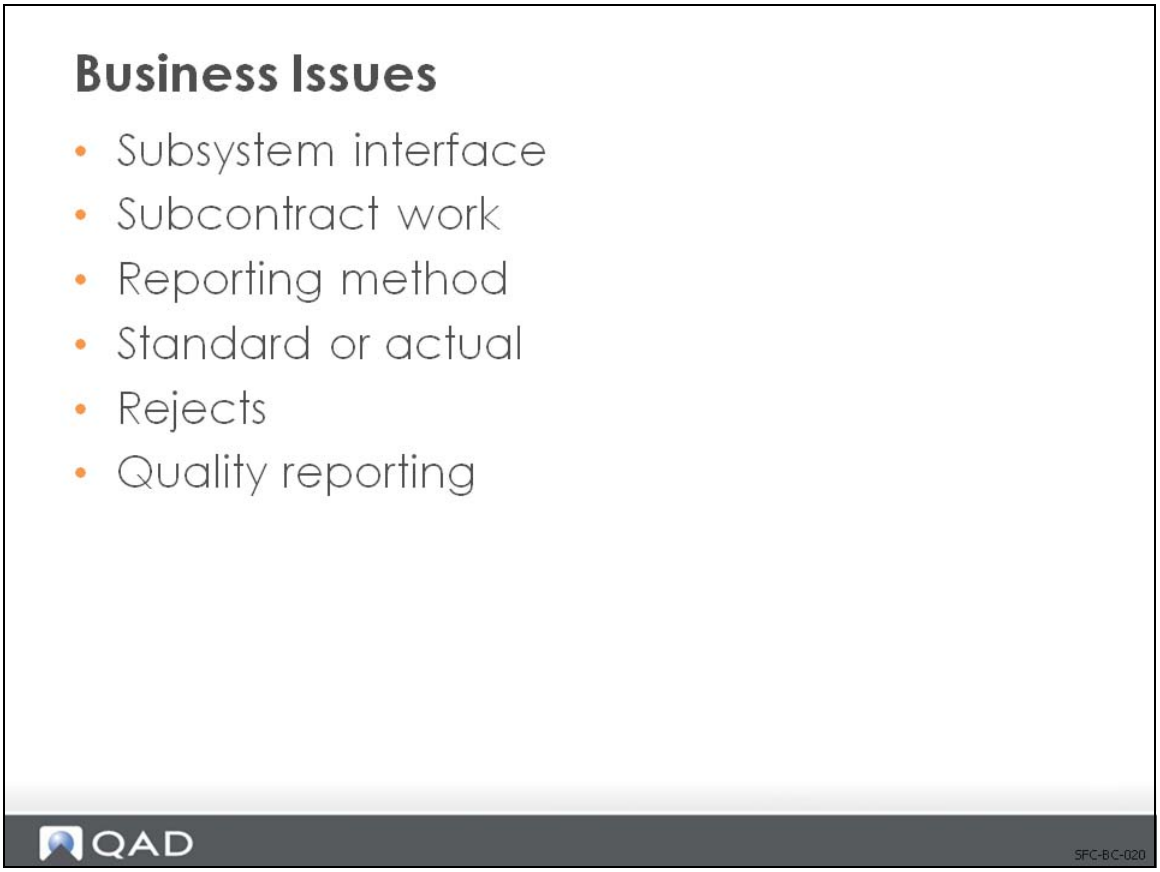
Chapter Objective



Benefits of examining key business considerations

- Collection of data by use of a subsystem will allow for efficient real time collection of data
- Capacity constrained operations can be controlled using subcontractors
- Selection of reporting operations will eliminate unnecessary administration
- Data collection of rework, rejects and quality tests can be managed by SFC

Overview

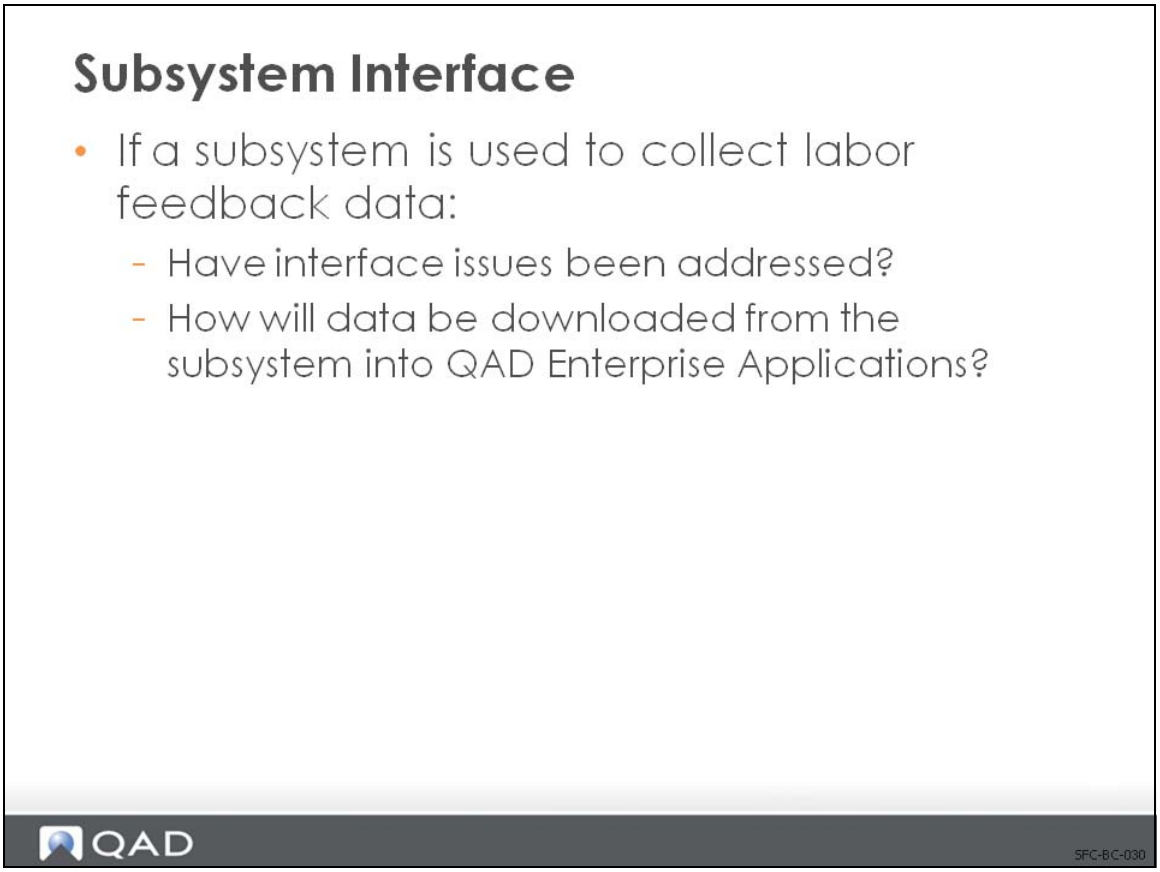


There are several business issues to take into consideration before setting up QAD Enterprise Applications Shop Floor Control (SFC). This section does not discuss all potential issues, but presents some issues to generate thought and discussion.

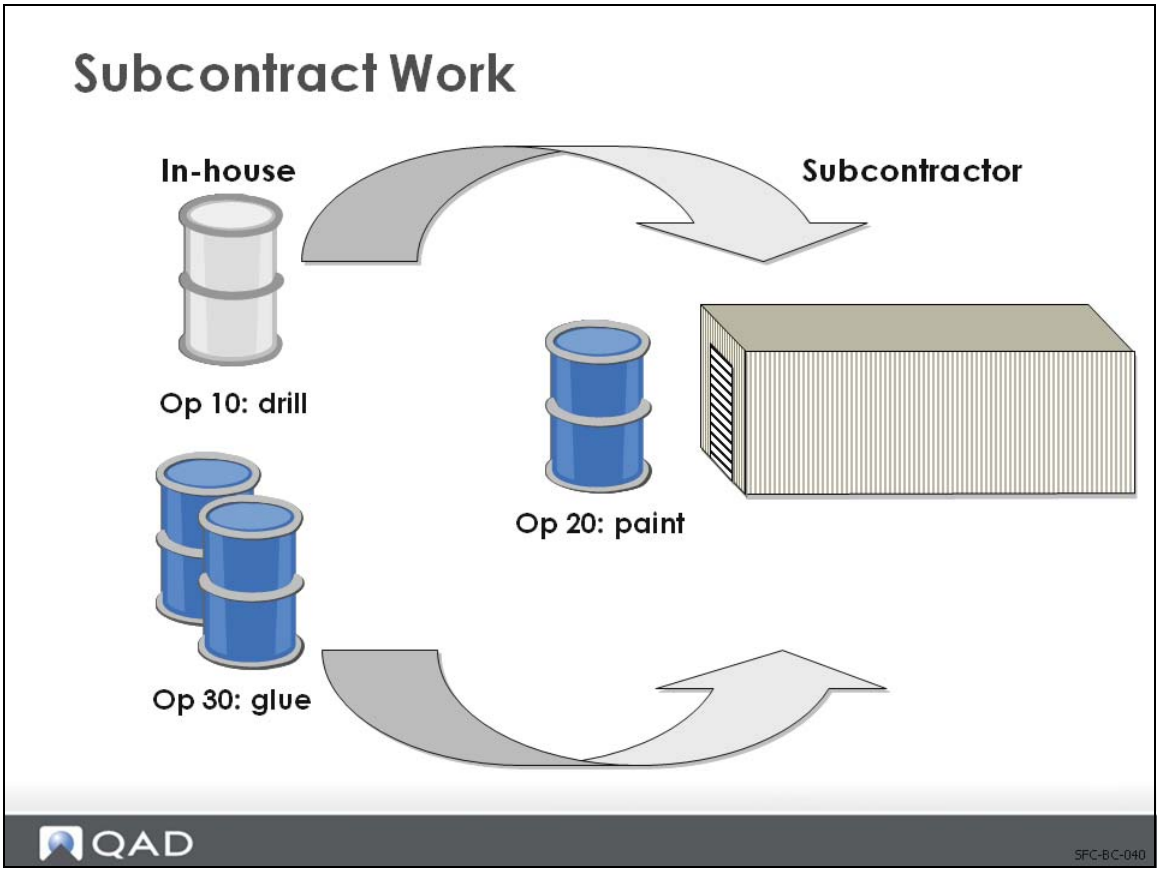
The key question to ask is:

- What is the primary business goal?
  - To track labor time?
  - To track productivity?
  - To track work in process (WIP)?

Subsystem Interface



Subcontract Work



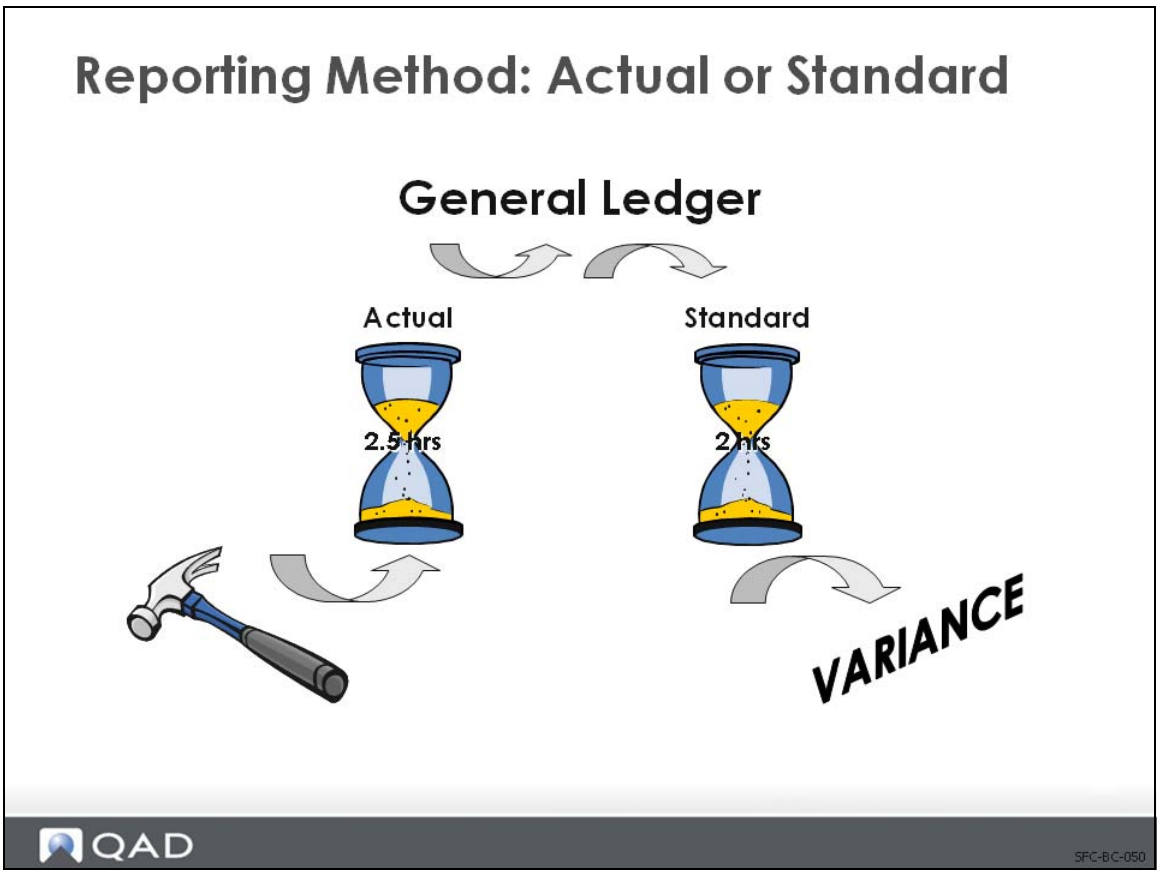
Some work order operations may need to be completed by outside suppliers/subcontractors.

- Subcontract operations may be necessary when there is insufficient manufacturing capacity or when operations require specialized equipment and machinery

The SFC module may be used with the Work Orders (16) and Purchasing (5) modules in the subcontract cycle for closer tracking of WIP.

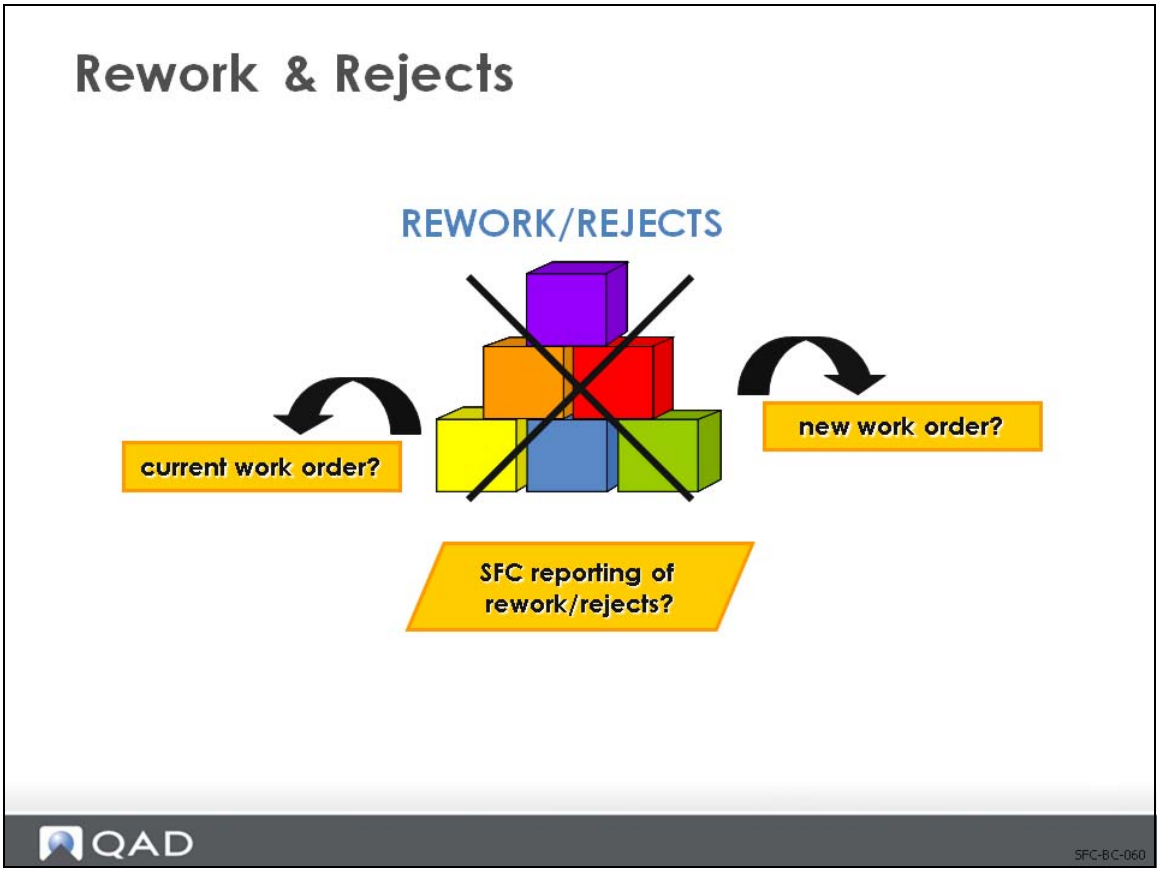
Subcontract items are received into WIP. The receipt updates the quantity completed at the designated work order operation and sets the operation status to C. In Purchase Order Receipts, you can specify to “Move to Next Operation” to set the status of the next operation to [Q]ueue so it will appear on the dispatch list.

Reporting Method



- Determine where labor reporting is important on the shop floor
  - At every operation, or at milestone operations?
- Determine whether actual or standard labor reporting is to be used
  - Choose one, based on business objectives

Rework and Rejects



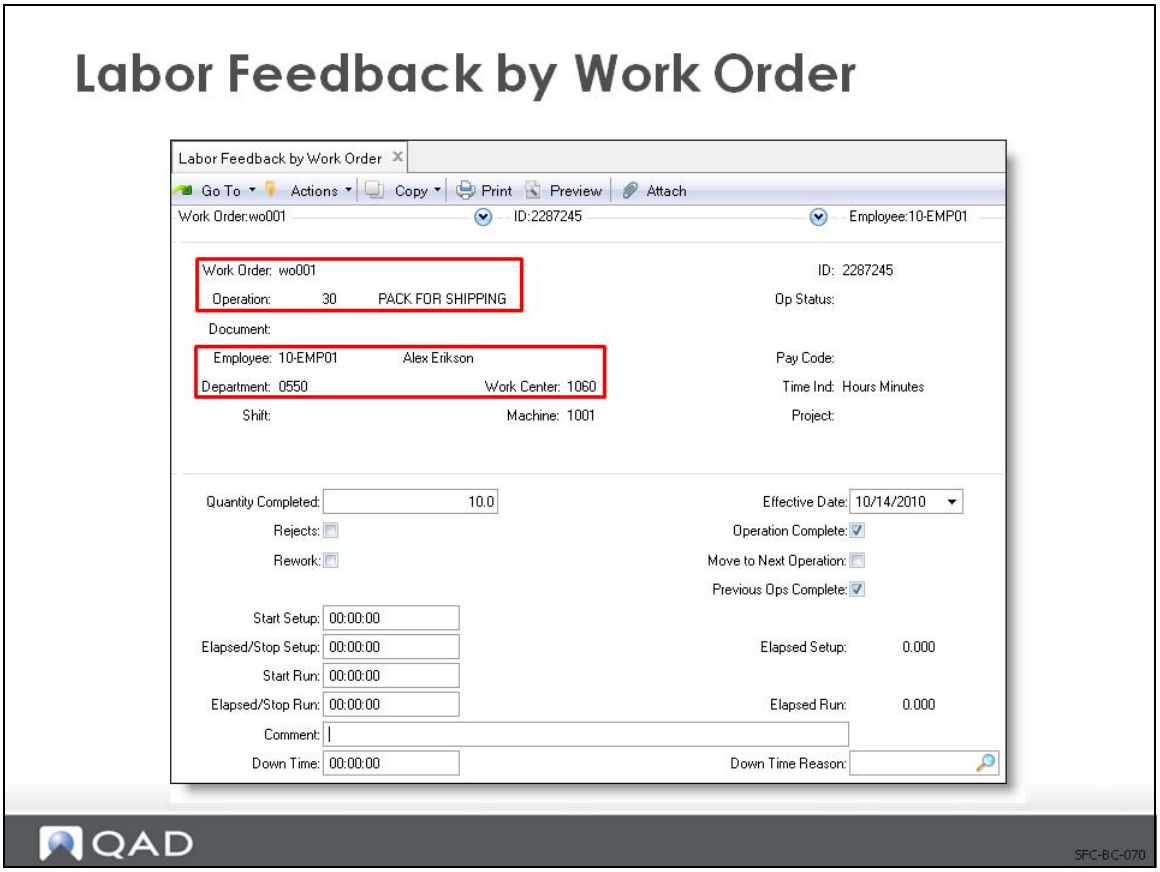
How are costs for rework/rejects captured?

- In the original production work order?
- In a new work order, type “R”?

Rework/rejects entered in SFC are recorded for reporting purposes only and have no consequence for the general ledger (GL).

- Based on costing approach, determine whether or not to record rework/rejects in SFC

Quality Reporting



Testing procedures may be devised and routed along with the product throughout the production process. Actual test results may be entered in Labor Feedback Transactions with real-time notification of out-of-tolerance conditions.

Setup Implications

- To identify tests that must be performed as part of an operation, attach test specifications to routing operations by using Item Specification Maintenance.
  - Discussed in detail in the Quality Management Module materials.

Review Questions

1 What is a subsystem in relation to Shop Floor Control?

2 In subcontract Shop Floor Control where are quantities tracked or recognized?

3 What two factors should be considered in setting up Shop Floor Control reporting?

4 How is Shop Floor Control used to ensure product quality?

Answers to Review Questions

1 Shop floor feedback gathering applications, e.g., bar-code reader.

2 When PO receipt is processed to receive items into WIP.

3 Whether to book standard hours or report actual labor hours.

Summary


Summary of Business Consideration Topics
Processes and procedures
Reporting requirements
Customer expectations
Product configuration
QAD
SFC-BC-080

Chapter 3

Set Up Shop Floor Control

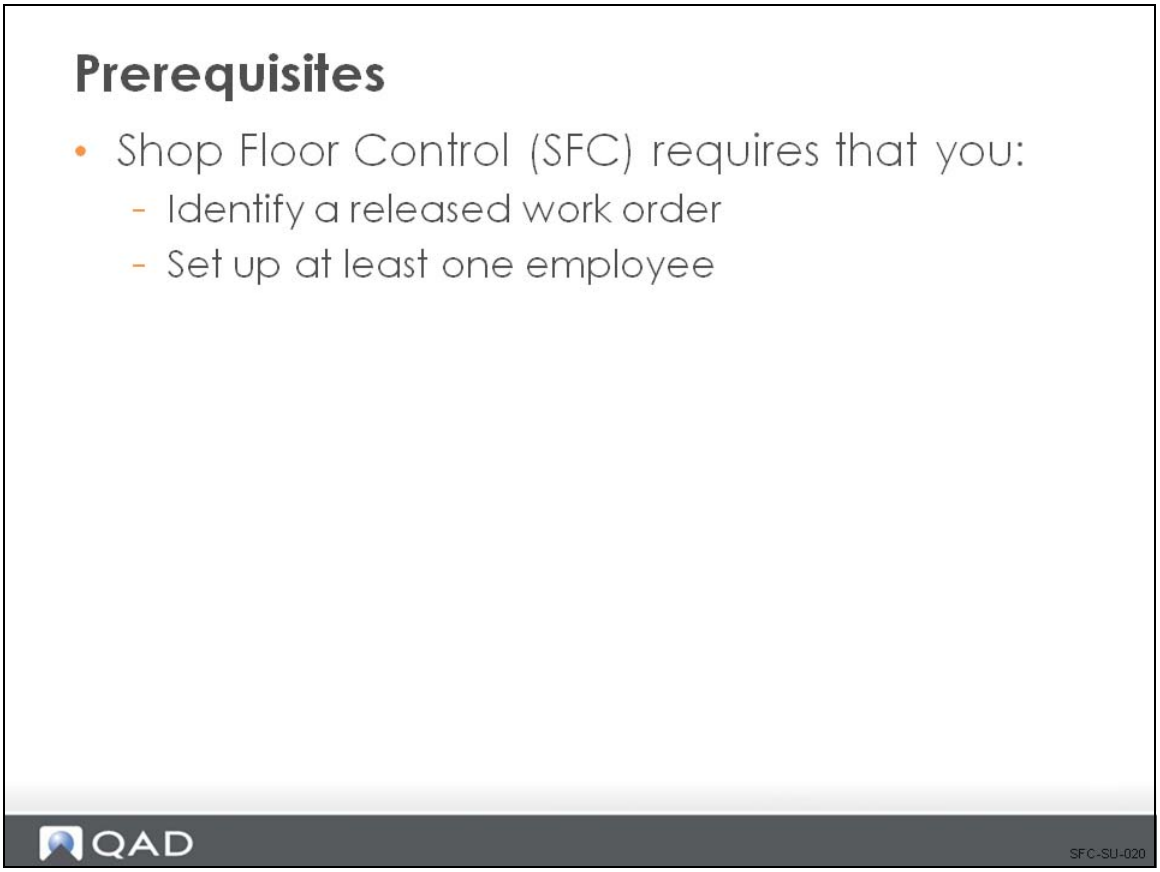
Chapter Objective

Benefits of proper Shop Floor Control setup

Proper setup of SFC will:

- Reduce administrative maintenance SFC in the long run
- Make the collection of labor, burden and variances meaningfully comply with accounting requirements of your organization
- Align departments and work centers so that capacity reports can effectively manage capacity requirements of the shop floor

Prerequisites



- Labor feedback is entered by work order, employee or work center/machine. In all cases, you must identify a released work order.
- Labor and material movements are tracked in SFC. It requires that you set up at least one employee.
  - If you are using SFC to record operation transactions and not labor for individual employees, create a pseudo employee and record all time, operation moves, and completions against it

Shop Floor Control Setup

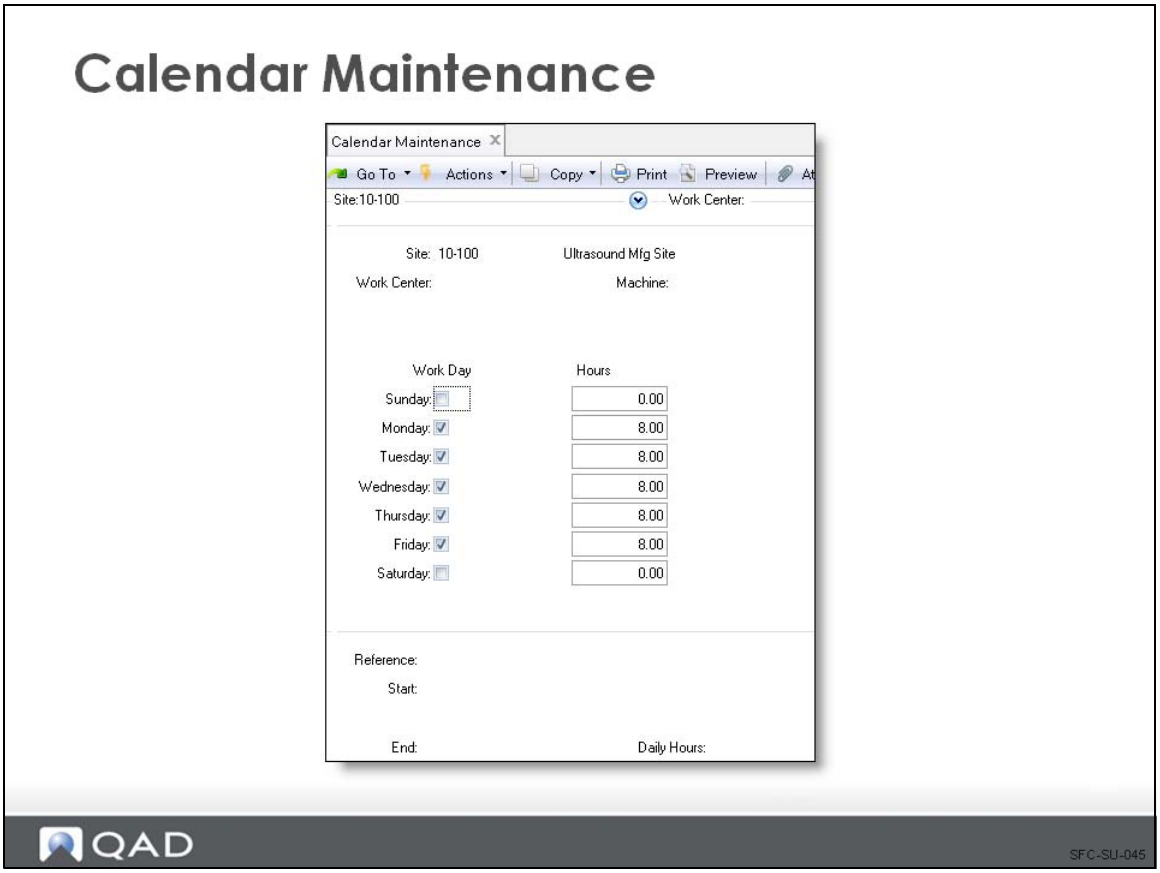
This illustration is a suggested setup sequence of master files for the Shop Floor Control module which is based on information that flows from one master file to another and prerequisites that need to be accomplished before setting up a file.

Review Shop Calendars

QAD Enterprise Applications allows separate shop calendars for each site/work center/machine that you create. Each can have its own work days and work day duration entered in Calendar Maintenance.

- Holidays that affect all calendars can be entered using Holiday Maintenance
- Work-center specific holidays must be entered through Calendar Maintenance using the Reference field

Calendar Maintenance

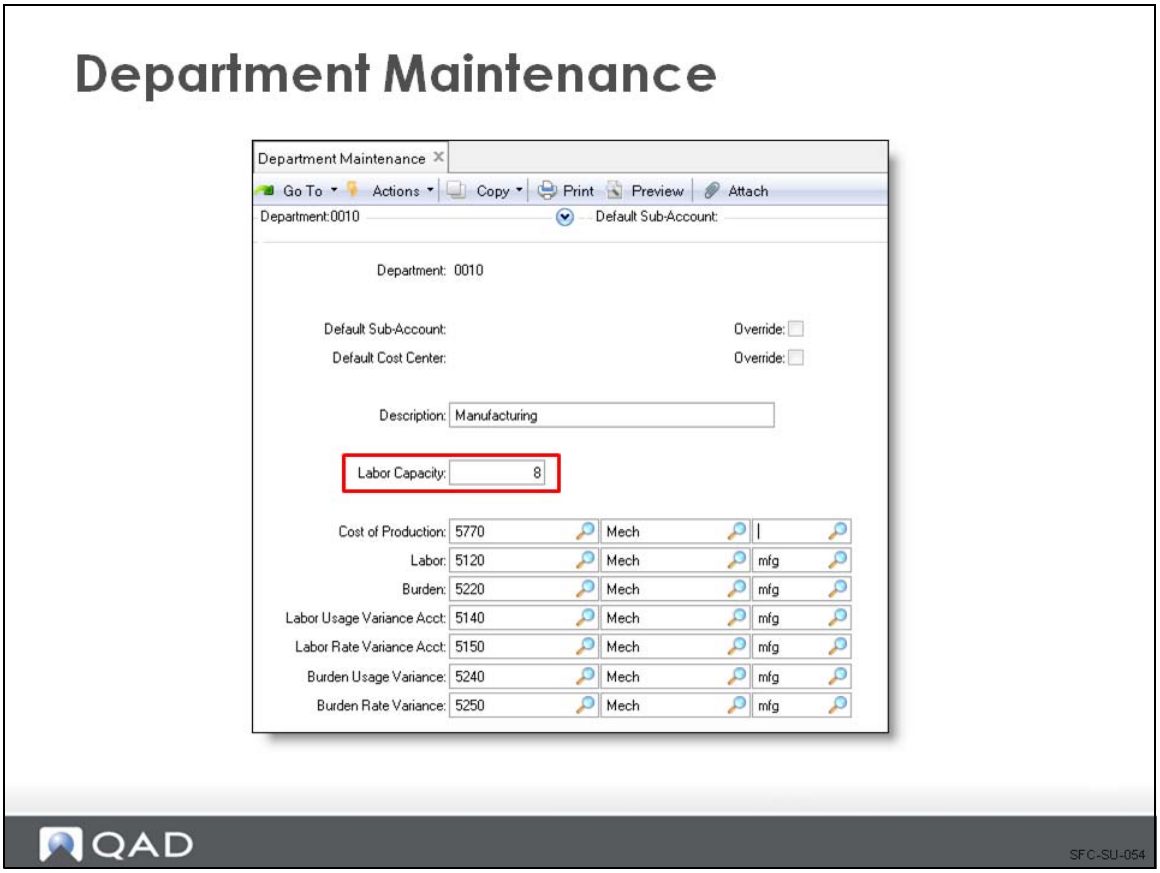


Review GL Accounts and Routings

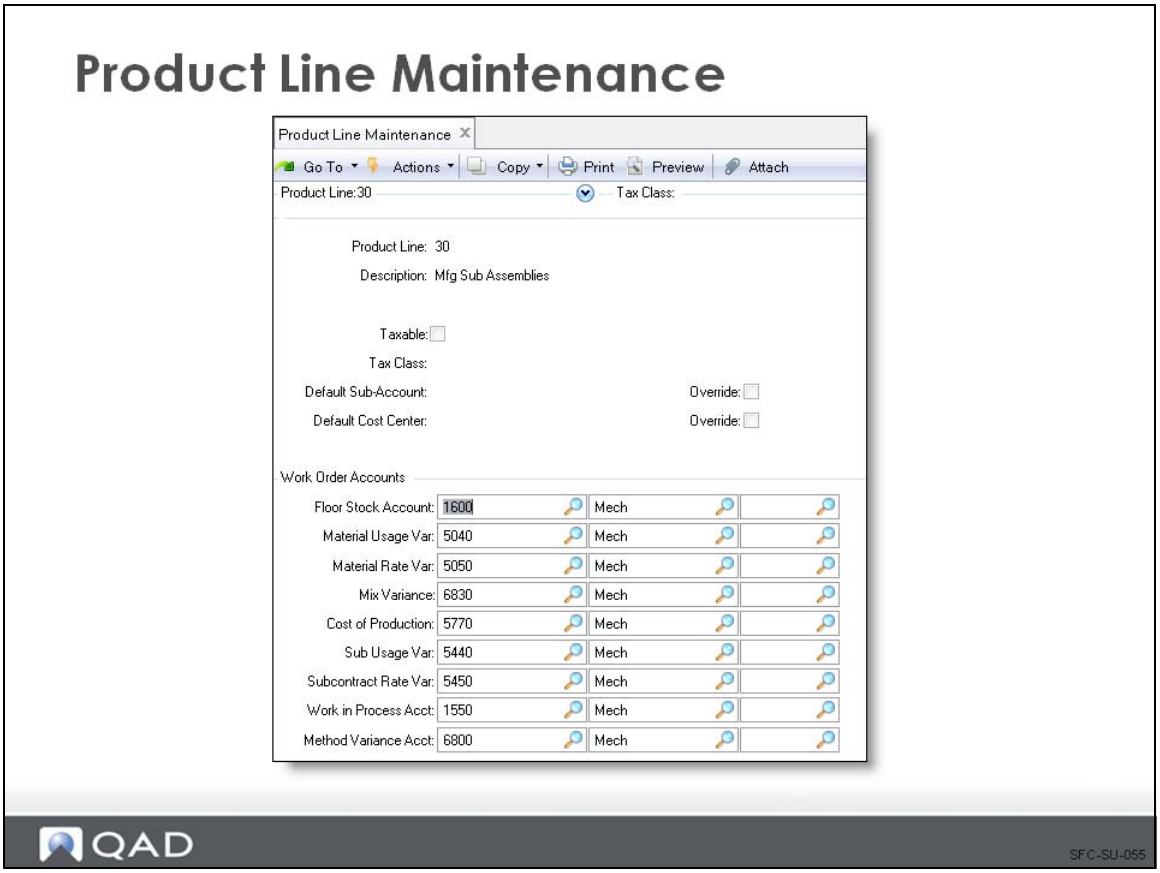
Labor reporting relies on accurate standard operation times (setup, run, and lead time) and costs (labor, burden, and subcontract) from routings definitions. For this reason, it is good to check the following:

- For each department, review the GL accounts used for posting labor-related costs in Department Maintenance. (For product lines, review GL accounts in Product Line Maintenance)
- For each work center, review the queue time, wait time, and machines per operation, as well as the labor and burden costs in Work Center Maintenance
- Review each routing definition in Routing Maintenance

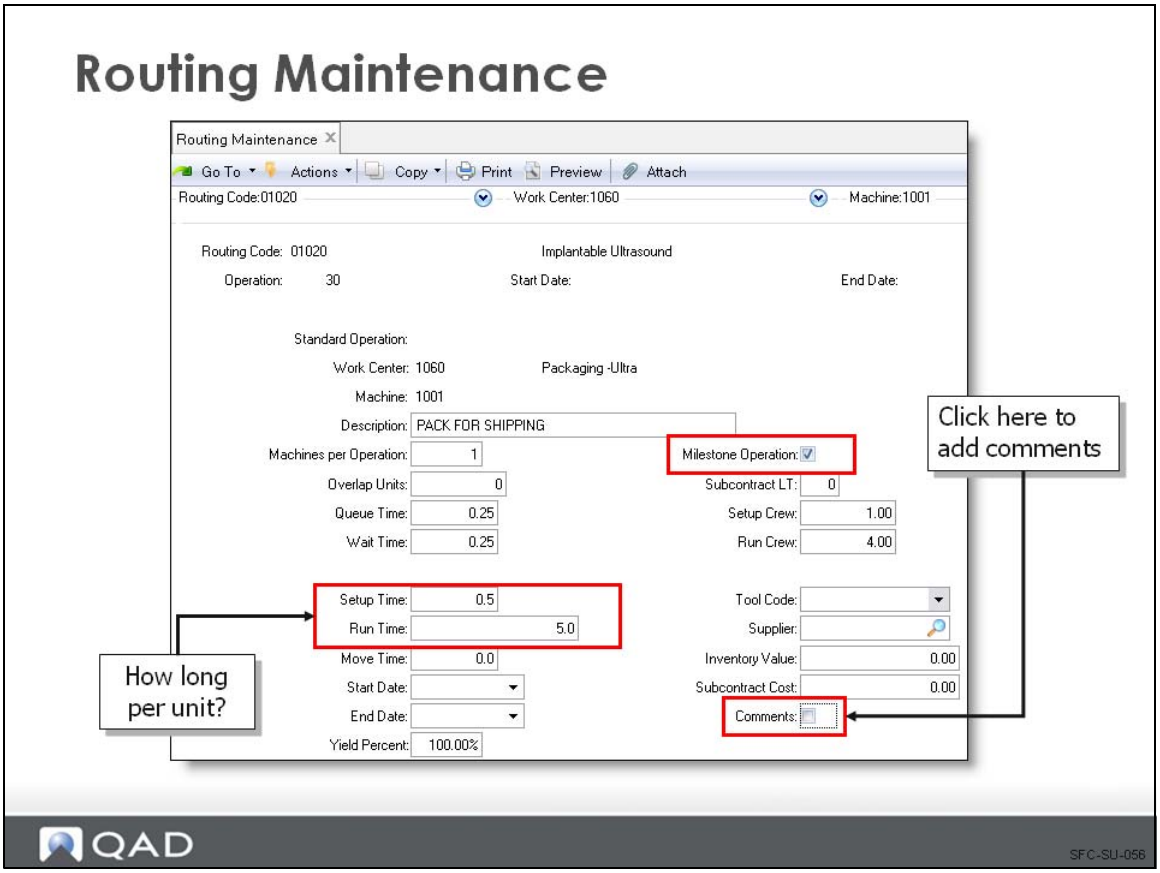
Department Maintenance



Product Line Maintenance

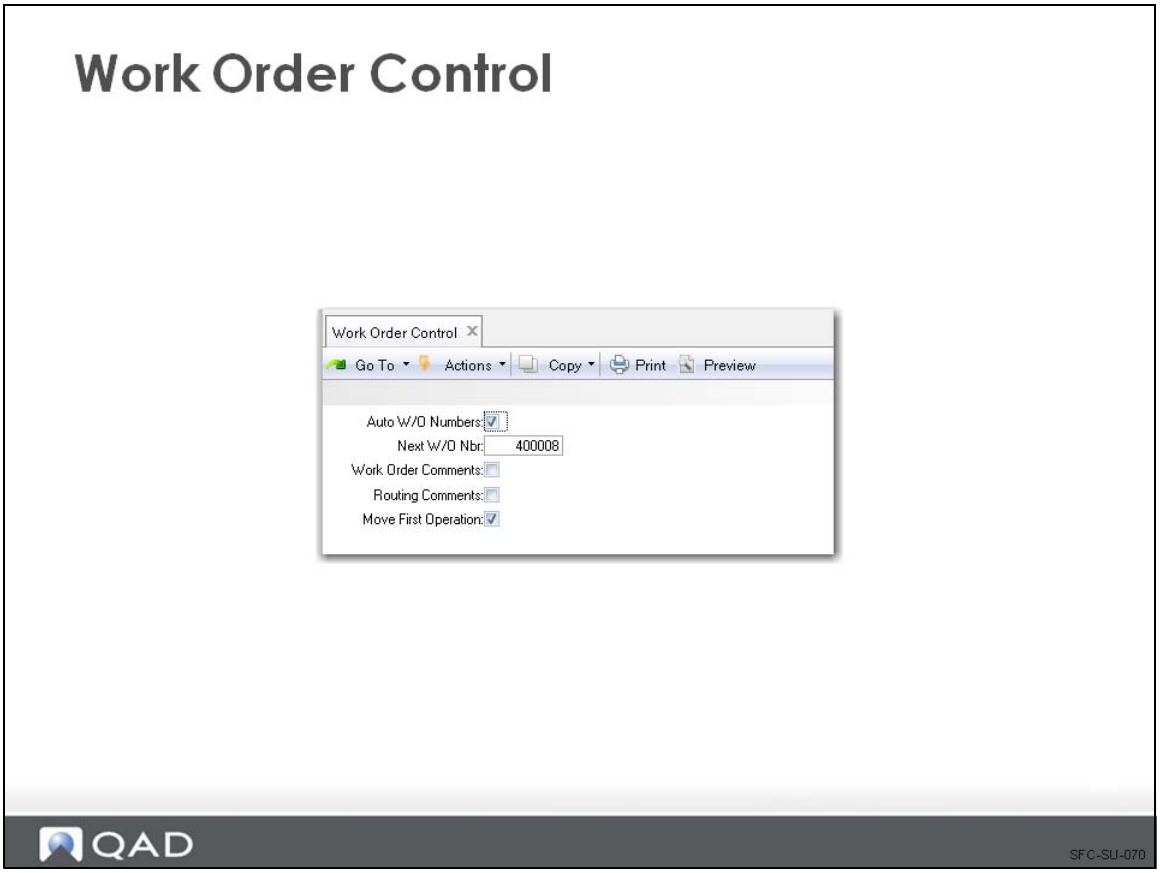


Routing Maintenance



Review Work Order Control

Work Order Control



Auto W/O Numbers. Indicates if the system assigns manually entered work order numbers automatically. If unchecked the user must assign work order number manually.

Next W/O Number. If Auto Number is checked, determines what the next system assigned number will be.

Work Order Comments. Indicates whether comments are normally entered for each Work Order. The setting of this flag does not control whether comments can be entered. It determines the default displayed.

Setting this flag to Yes causes the Work Order comment flag to default to Yes. When the comment flag on a Work Order is set to Yes, the transaction comment screen displays for the user to enter comment text.

Routing Comments. Indicates whether comments are normally entered for each routing operation. The setting of this flag does not control whether comments can be entered. It determines the default displayed.

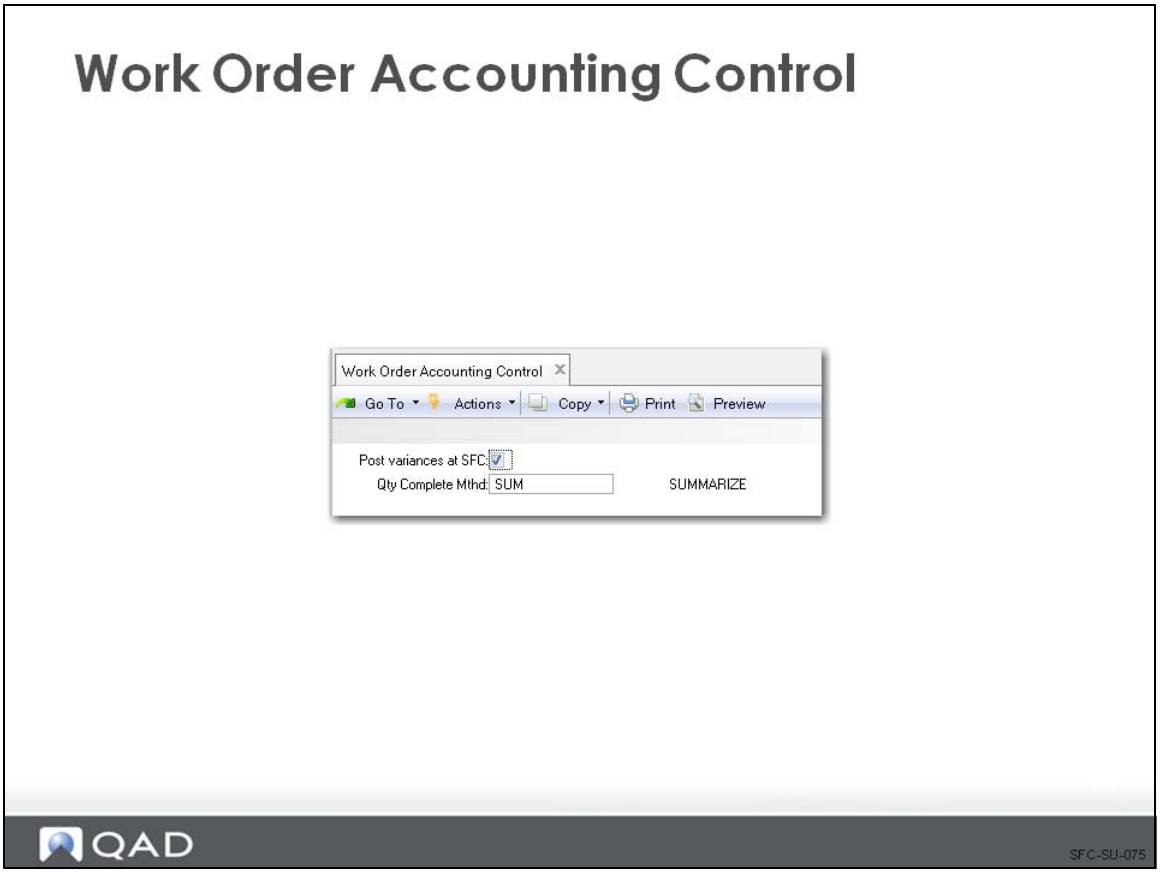
- Setting this flag to Yes causes the operation comment flag to default to Yes. When the comment flag on an operation is set to Yes, the transaction comment screen displays for the user to enter comment text.

Move First Operation. Indicates whether the work order release function should set the status of the first operation to [Q]ueue.

- Yes sets the status for the first operation to Queue upon work order release.

- Sometimes this may not be appropriate. If there is a lengthy picking effort required, the work order may not be ready as soon as it is released. In that case, set this flag to No. Once the picking is complete, use the Operation Move function to change the status to [Q]ueue.

Work Order Accounting Control



Post Variances at SFC. Indicates whether variances are only calculated and posted at the time of work order receipt.

- Yes processes variances when labor is entered in SFC. No holds labor, burden, and usage variances until work order receipt.
- Setting this flag to No will reduce the number of GL transactions created if there are many shop floor labor transactions processed before material receipts are recorded.
- If you have very long run times, or if you are using SFC employee efficiency reports, you may want to set this flag to No, suppressing variance calculations until finished product is received

Quality Complete Method. Specify the default method for Work Order Accounting Close to use to calculate the base process quantity complete for a joint order set. Valid values are SUM, SUMC, MAX, MIN, and ORD. You cannot leave this field blank. See Co/By Products, or filed help, for more details

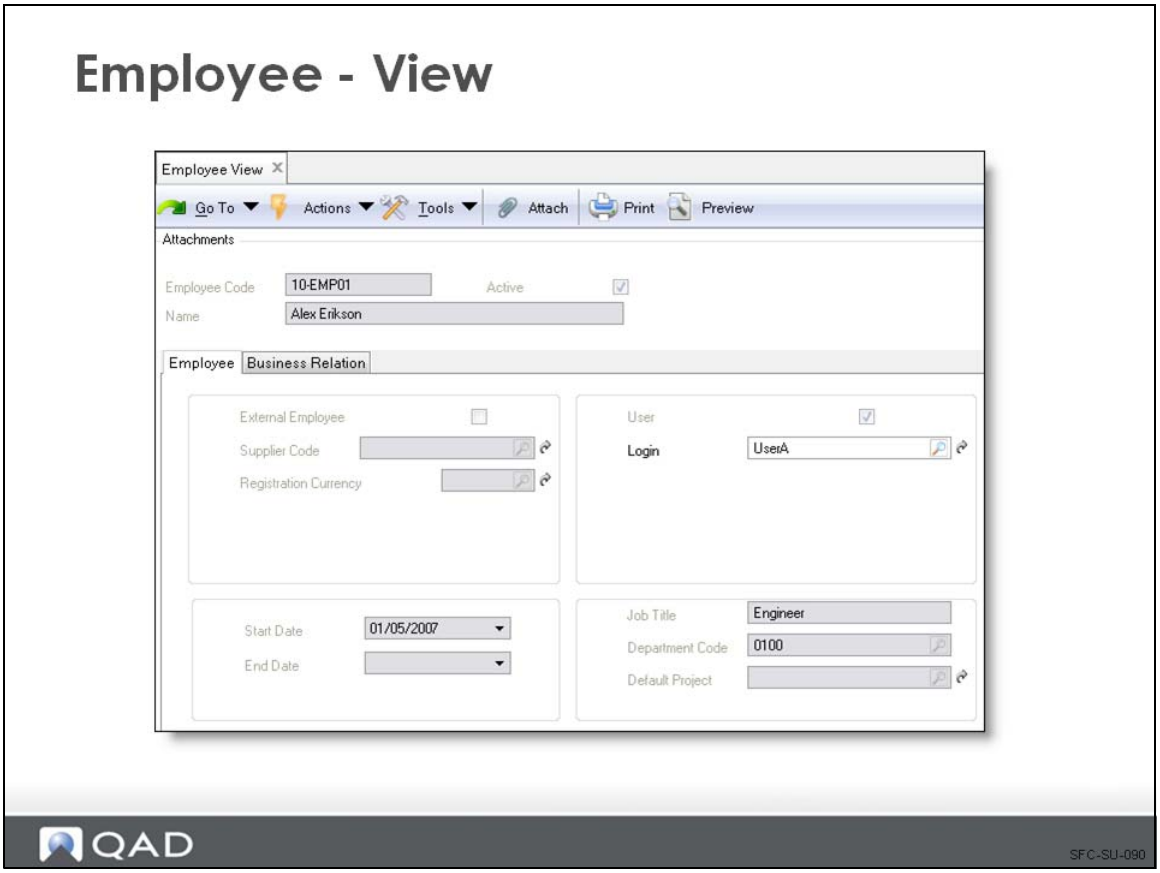
Enter Employee Data

Employee Maintenance establishes the default department, project, and work location for employee labor reporting. The user may override these defaults on any labor feedback transaction.

To use SFC, you must enter at least one employee record.

- If you are using SFC to record operation transactions and not labor for individual employees, create a pseudo employee and record all time, operation moves, and completions against it.
- If you are recording labor by employee, enter the appropriate information in Employee Maintenance. Be sure to assign the correct department and ensure that the Employment Status is set to Active.

Employee View



Employment Status. A code identifying the employment status of this employee.

Check that the Employment Status field is set to AC (active).

Department. The department in which this employee normally works. This department links labor and downtime report for this employee to the correct GL accounts

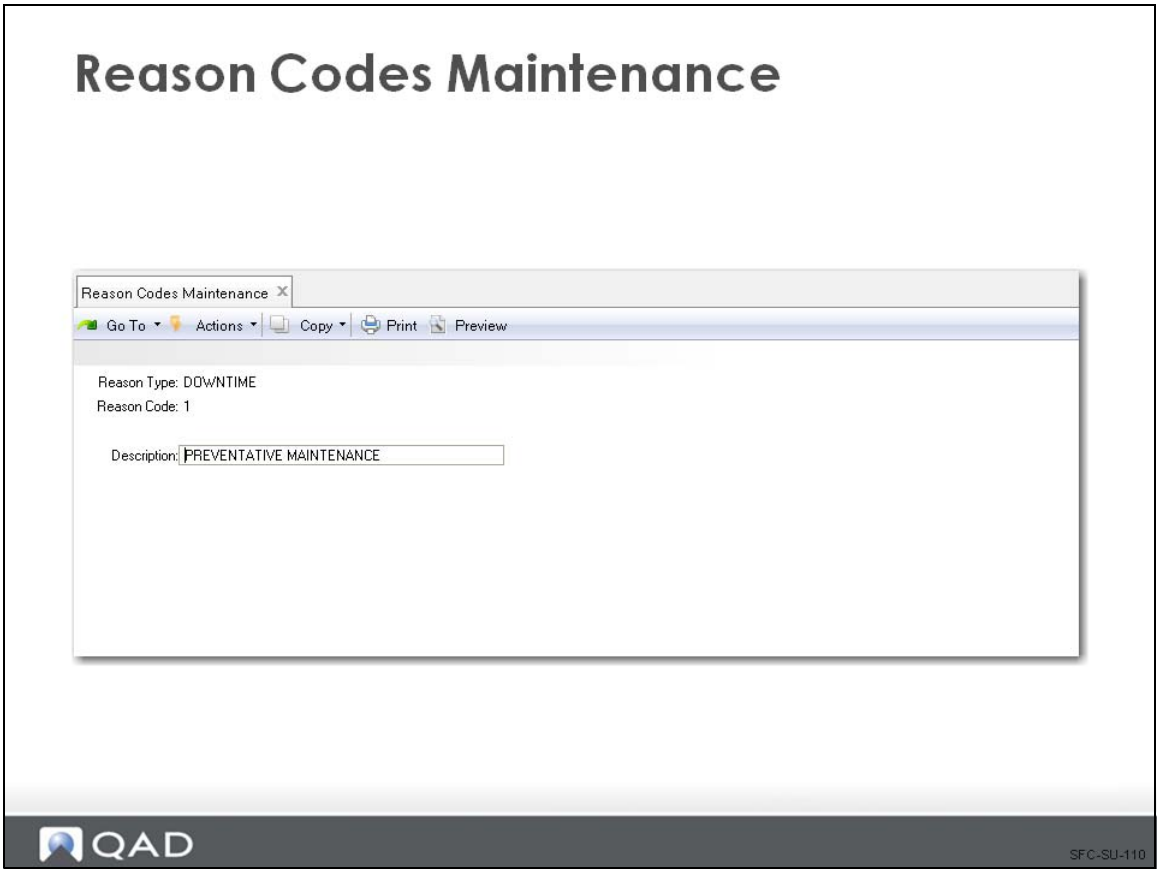
This field is a default useful for reviewing employees by department

Define Reason Codes

In SFC, down time can be recorded and reported by reason code. The following screens use reason codes.

- Labor Feedback – Down Time, Rejects and Rework fields
- Non-Productive Labor

Reason Codes Maintenance

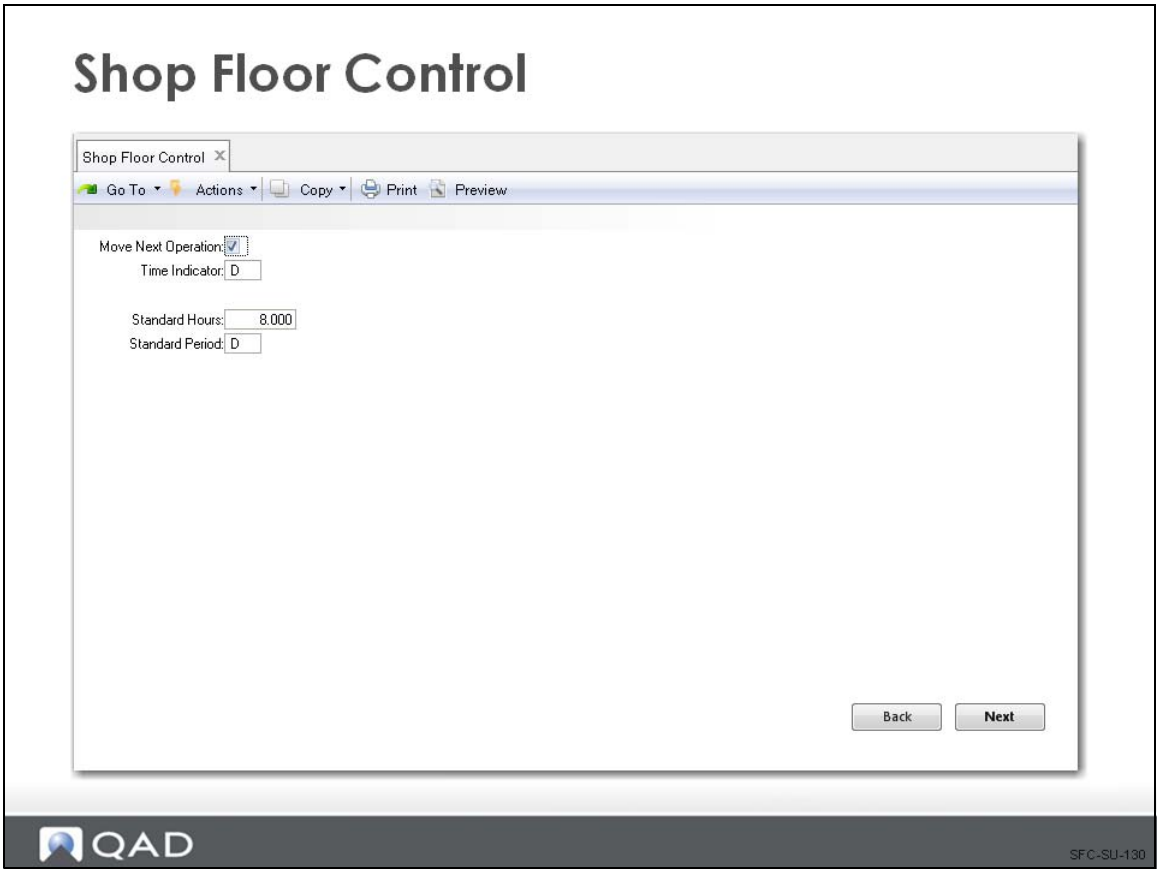


Reason codes are set up in Reason Codes Maintenance. For example, reason type DOWN might include reason code 1 for preventive maintenance, 2 for company-wide meeting, and so on.

Set Up Shop Floor Control

The format of the labor feedback data is controlled by the Shop Floor Control.

Shop Floor Control



Move Next Operation. If Yes, when an operation is reported as completed, the system will automatically move the work order to the next operation with status of Queue.

Time Indicator. Identifies how labor hours are normally reported. If set to D, labor time is entered in decimal hours; if set to H, labor time is entered in hours:minutes:seconds.

- If you are using a shop floor data collection system, set this flag based on the type of output that system produces

Standard Hours. This field shows the number of hours per period. Used to determine when labor hours represent overtime.

Standard Period. A code identifying the standard work period. The period may be day [D] or week [W].

Summary

Review of the topics we have covered in this chapter.

Exercise: Shop Floor Control Setup

1 Use Calendar Maintenance (36.2.5), with Site, Work Center and Machine fields blank, to verify a default shop calendar of five eight hour days, Monday through Friday.

2 Use Department Maintenance (14.1) to review the accounts codes for labor reporting defined for the Manufacturing department (0010).

3 Use Product Line Inquiry (1.2.2) for product line 10 to review the work order accounts that will be used for labor reporting.

4 Use Work Order Control (16.24) to configure the settings:

- Set Auto W/O Numbers to Yes.
- Note the value of the Next W/O Number.
- Set both comments fields to No.
- Set Move First Operation to Yes.

5 Use Work Order Accounting Control (36.9.11) to verify that Post Variances at SFC is set to Yes.

6 Use Employee View (36.1.7.3) to review the record for Employee 10-EMP02, named Brody Tupper. This record will be used for all labor reporting.

7 Use Reason Codes Maintenance (36.2.17) to add the following codes:

Reason Type	Reason Code	Description
Downtime	Mat 1	Out of Material
Downtime	Mat 2	Material Out of Spec
Downtime	Mach 1	Machine PM
Downtime	Mach 2	Machine Down
Reject	Size	Out of Spec
Reject	Config	Out of Spec
Rework	Pack	Repack unit

8 Use Work Center Maintenance (14.5) to verify the following settings for Work Center 1000:

Field	Data
Machine Bdn Rate	0.05
Setup Rate	5.00
Labor Rate	4.50
Labor Burden Rate	0.02
Labor Burden%	0.01%

9 Use Shop Floor Control (16.20.24) to verify the following settings:

Field	Data
Move Next Operation	Yes
Time Indicator	D
Standard Hours	8
Standard Period	D

Exercise: Operation Scheduling

This exercise will demonstrate the difference between work order due dates based on system calculated lead times based on standard order quantity and operation scheduling based on actual work order quantities. You will also use forward scheduling.

1. Use Work Order Maintenance (16.1) to create a work order for item 02003 at site 10-200 for a quantity of 100. Let the release and due dates default.
   - You can either let the system assign the work order number or manually assign a work order number such as Test 01 so that you can more easily find your work order later.
   - Set the work order status to “E” - exploded.
   - Note the system scheduled due date.
2. Use Work Order Routing Maintenance (16.13.13) for your work order. Note that the due date for operation 30 is the same as the order due date.
3. Use Work Order Maintenance (16.1) to create another work order for item 02003 at site 10-200 for a quantity of 500. Let the release and due dates default.
   - You can either let the system assign the work order number or manually assign a work order number such as Test 02 so that you can more easily find your work order later.
   - Set the work order status to “E” - exploded.
   - Note the system scheduled due date.
4. Use Work Order Routing Maintenance (16.13.13) to check the start and due dates for all operations on your work order. Why are the start dates before the release date?
5. Use Work Order Maintenance (16.1) to create another work order for item 02003 at site 10-200 for a quantity of 500.
   - You can either let the system assign the work order number or manually assign a work order number such as Test 03 so that you can more easily find your work order later.
   - Set the work order status to “E” - exploded.
   - Let the release default to today’s date and delete the due date (make the due date field blank). This will force the system to forward schedule the order from the release date.
   - After you cycle through all the work order screens, note the system scheduled due date.
6. Use Work Order Routing Maintenance (16.13.13) to check the start and due dates for all operations on your work order. By forward scheduling, you avoid the conflict of operation start dates before the release date.

Chapter 4

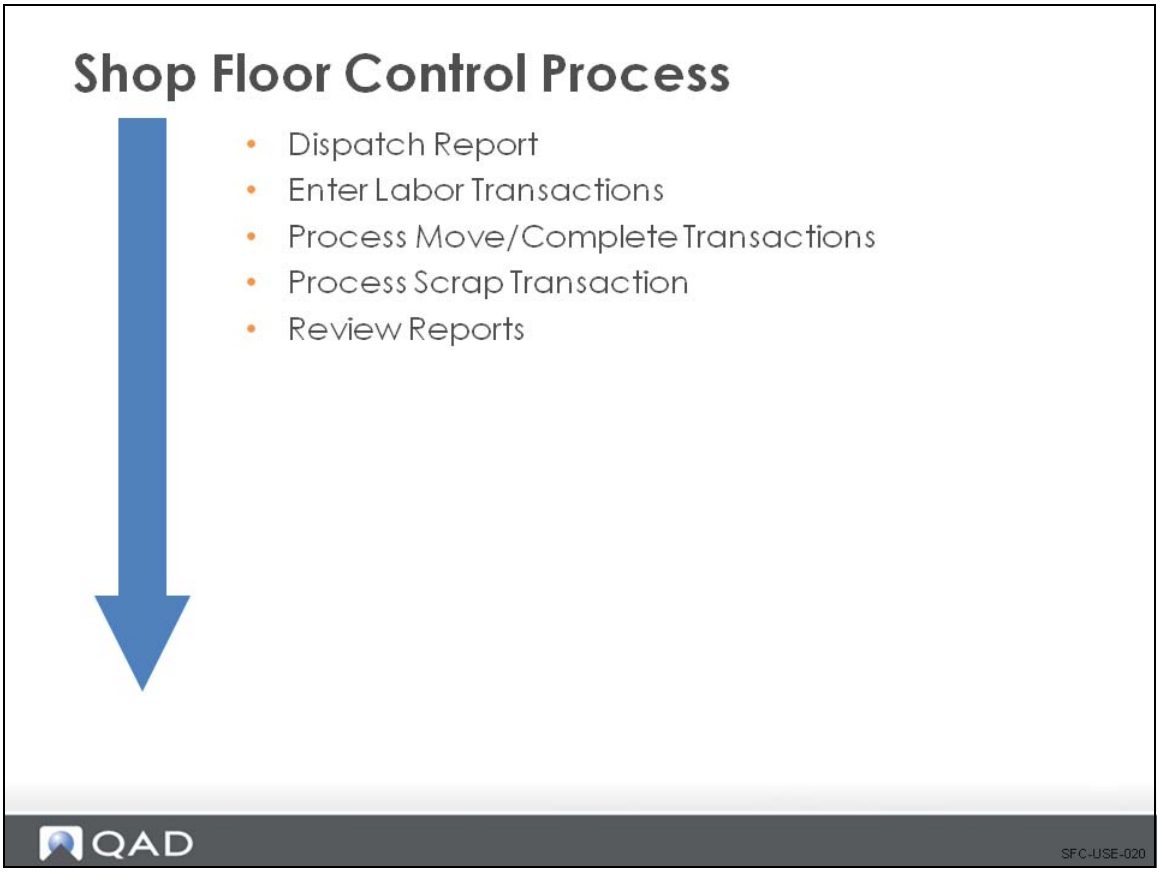
Use Shop Floor Control

Chapter Objective

Benefits of the use of Shop Floor Control

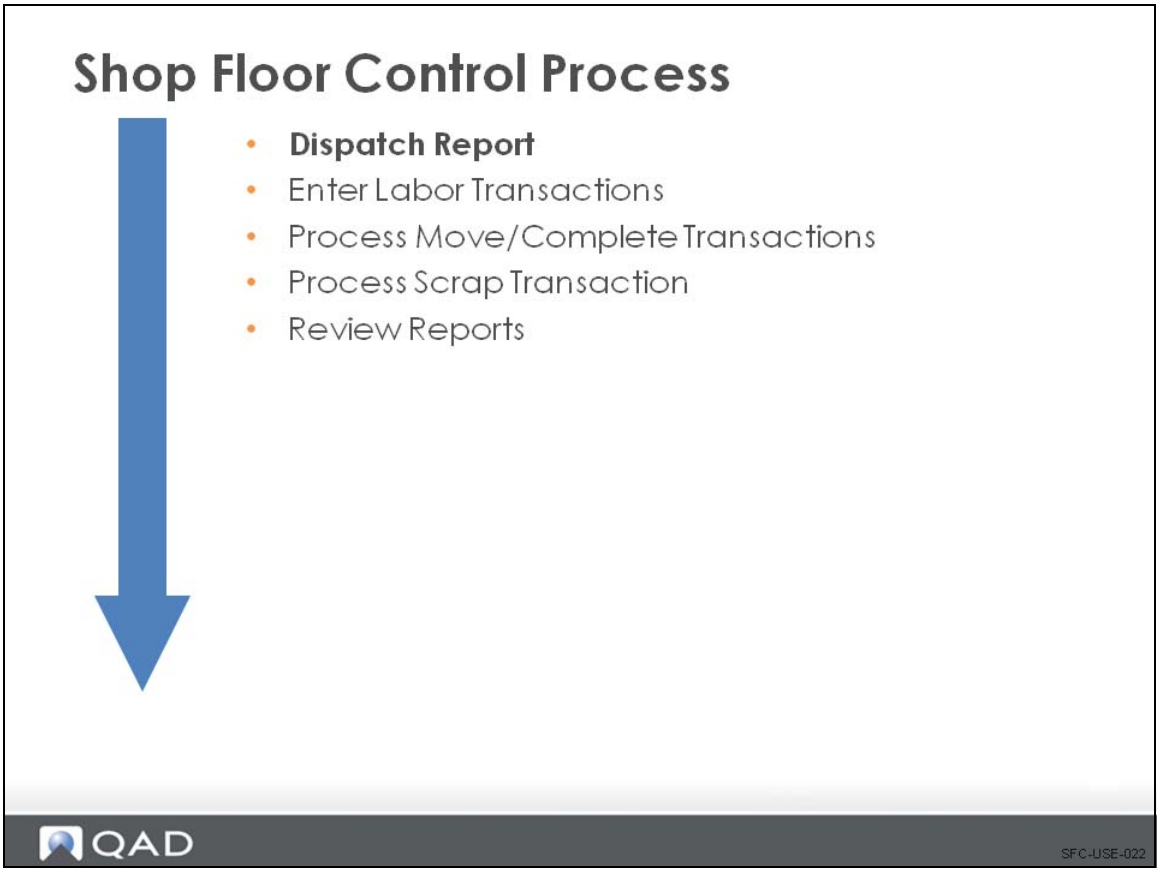
- Reduce the amount of WIP inventory
- Increase delivery performance of work orders
- Identify capacity issues
- Effectively manage the work orders costs of material, labor and burden.
- Correct administrative errors
- Effectively manage the scrap, rework, and rejects.
- Provide management with feedback reports

Shop Floor Control Process

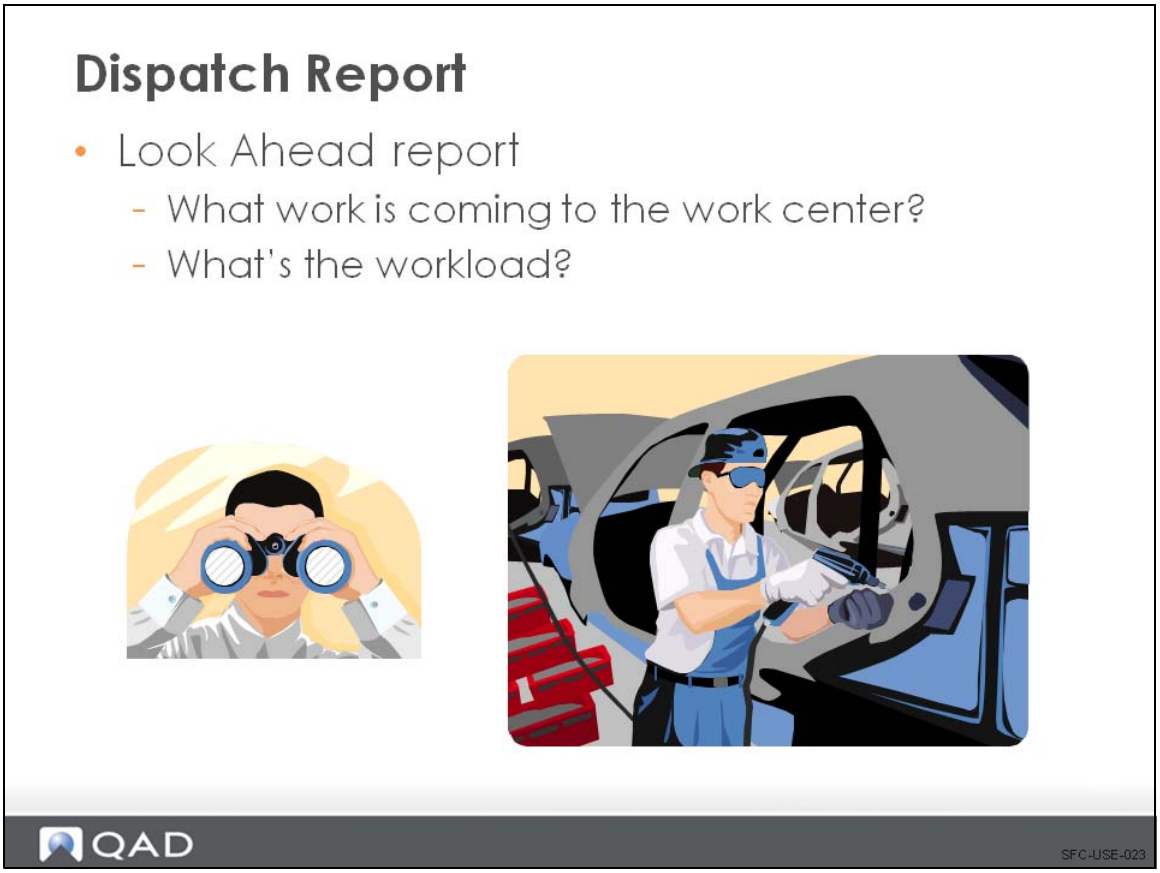


When processing work orders in Shop Floor Control, use Work Order Routing Browse to quickly view work order details such as item number, operation, description, work center, machine, quantity ordered, quantity complete, and start date.

Dispatch Report



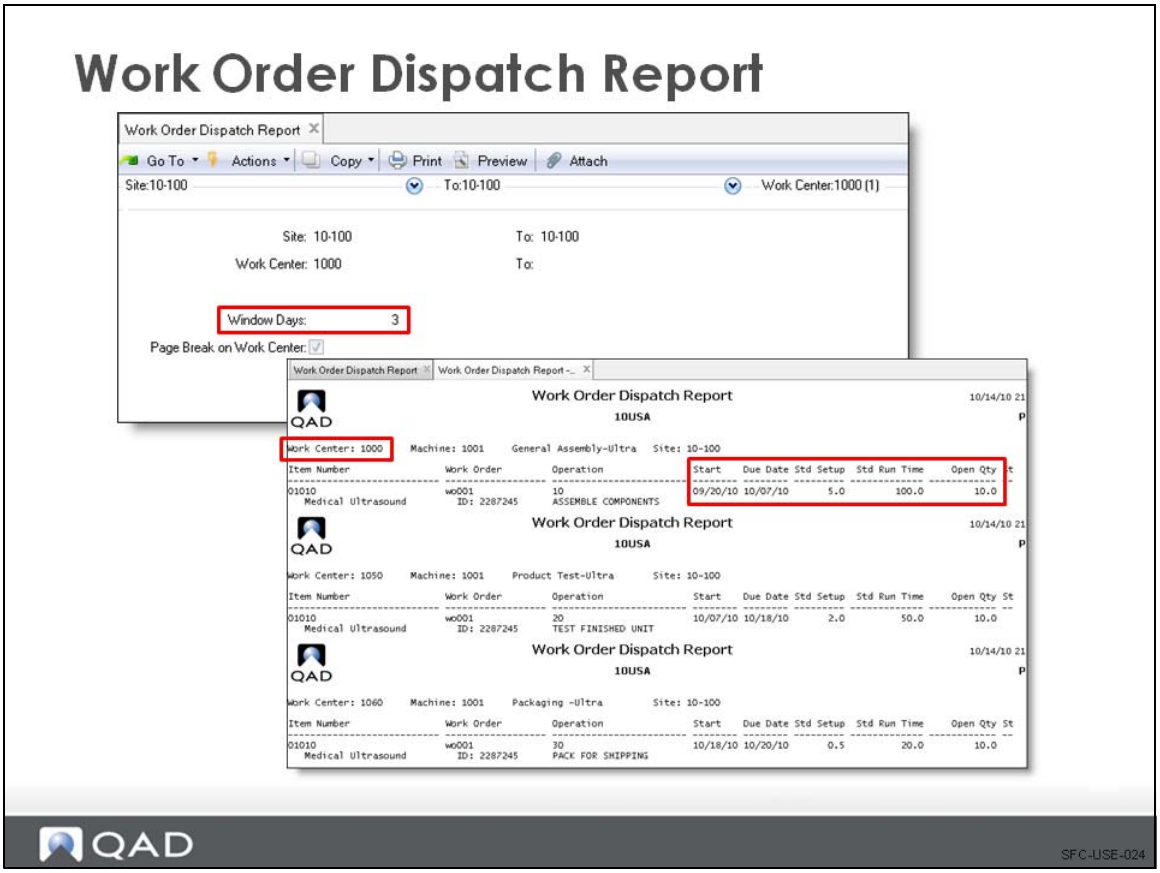
Review Dispatch Report



The Dispatch Report identifies work orders that will be arriving at a work center as well as those work orders already there. This information is useful in determining the work center's anticipated load and assists the dispatcher or production supervisor in establishing priorities for the orders. These lists are printed daily and are used to schedule work.

In QAD Enterprise Applications, the dispatch report includes all scheduled operations for a work center or machine. The operations are listed in ascending sequence by scheduled start date. The report usually includes all past due operations and those due to begin work within a user-specified time period. The specified period of time is established in the Window Days option prior to running the Work Order Dispatch Report.

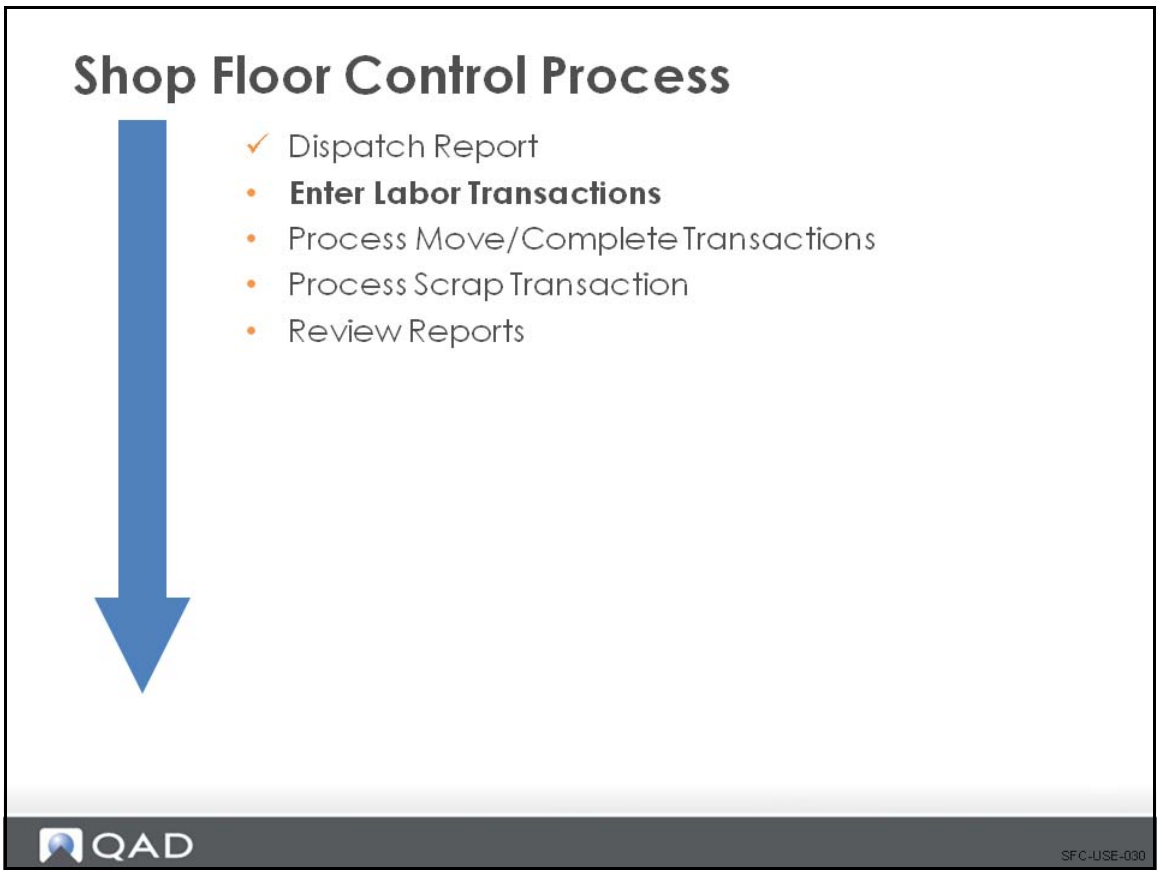
Work Order Dispatch Report



The work order dispatch report is designed to show shop floor personnel the work that is in their work center and coming to their work center. For each operation in the work center it shows the quantity of items on each order and the setup and run hours associated with that operation. It is an invaluable planning tool for shop floor supervisors.

The work order dispatch report is organized by work center within site. It has a user-defined “Window Days” which is the number of days into the future the report looks. Within the work center the report is sorted by item and operation.

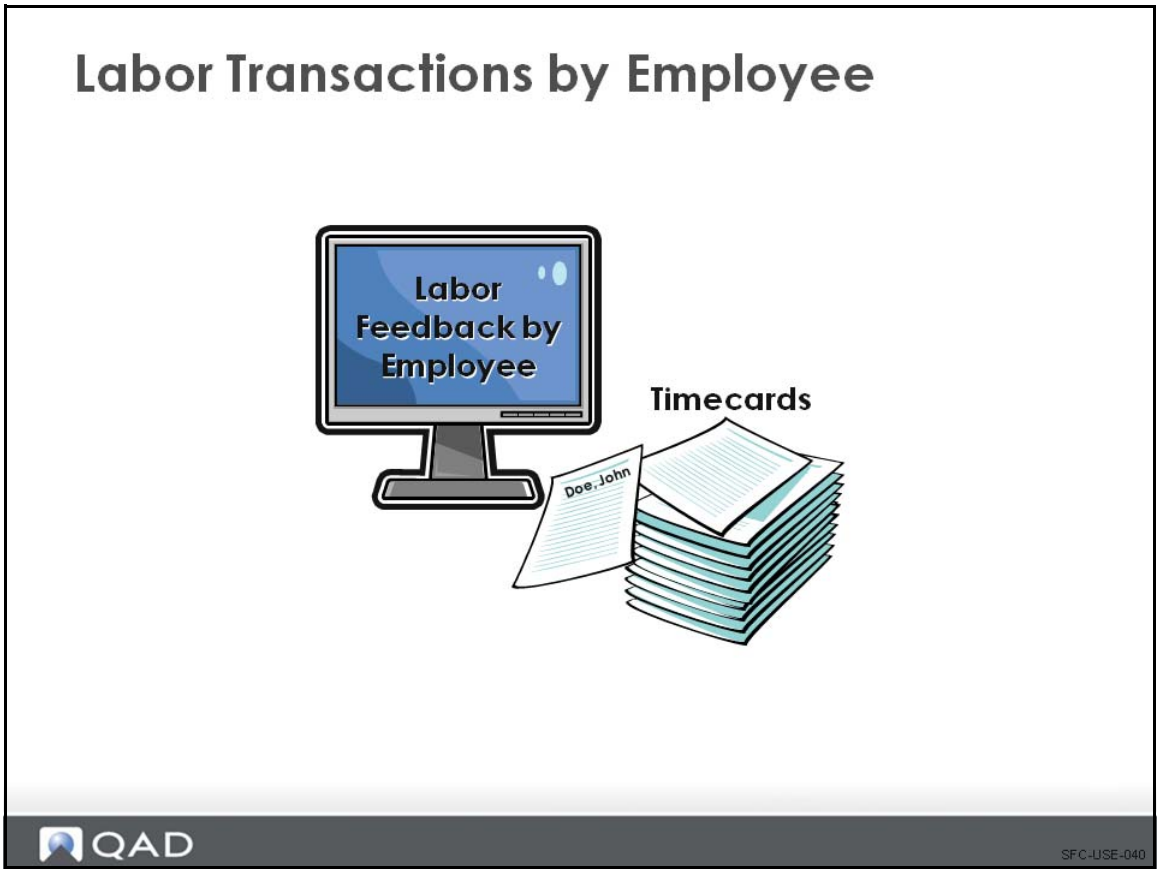
Enter Labor Transactions



Labor transactions report the movement of an order from one operation to another and record the quantity completed and rejected at each operation.

- Labor reporting relies on accurate standard operation times and costs from the routing definitions
- Labor is reported by:
  - Employee,
  - Work order, or
  - Work center

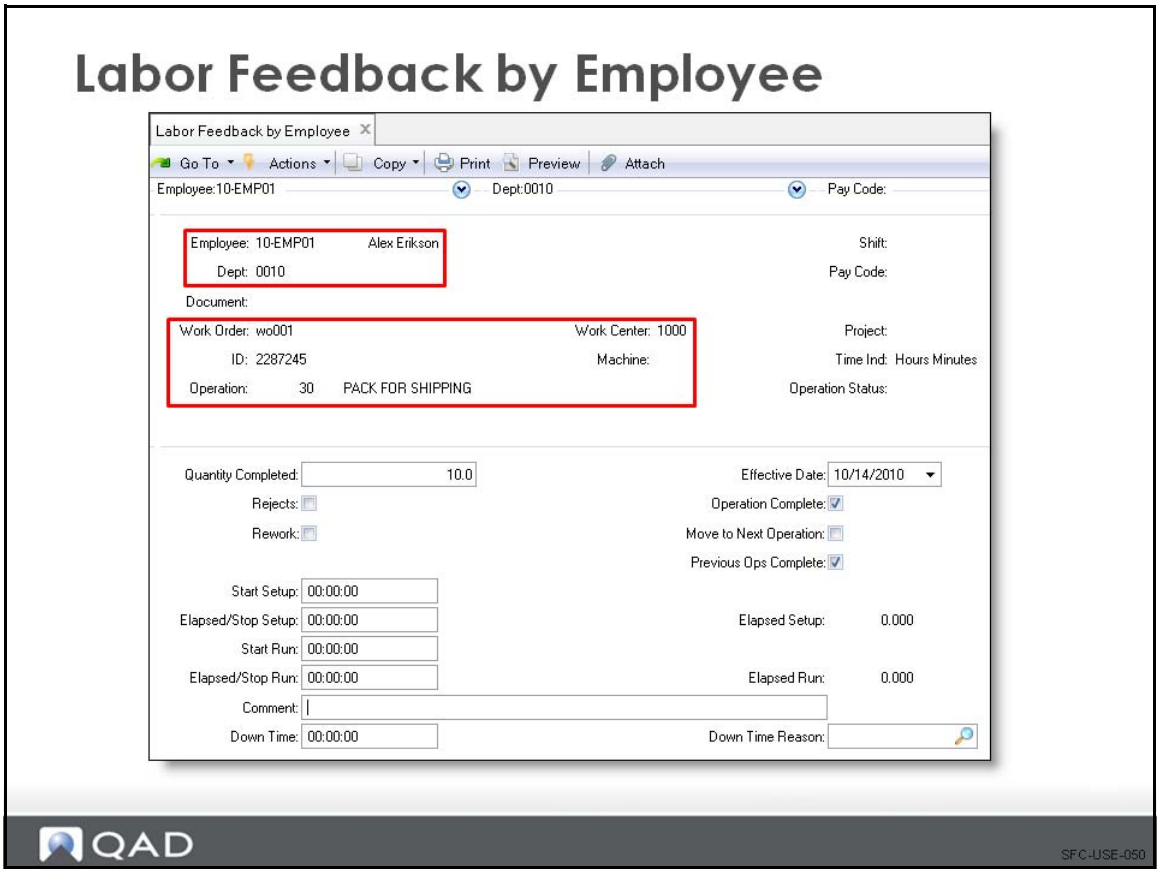
Labor Transactions by Employee



Each of the three labor feedback transaction screens – by work order, by employee, and by work center – has the same fields and collects the same information, but in different order.

- For data entry purposes, you may find that one Labor Feedback Transaction screen is easier and faster to use than another

Labor Feedback Transactions



Use Labor Feedback by Work Order, by Employee, or by Work Center to enter actual labor. By default, this reports an operation as completed and moves the work order to the next operation on the routing. All three Labor Feedback screens contain the same information, only the order of the fields is different for data entry purposes.

Employee. An employee code must be entered. It is not necessary for this code to correspond to an actual person. A single employee code can be set up and used only for reporting purposes.

Department. The default department code is determined by the work order routing. The system creates GL transactions using the accounts associated with the department code.

Work Center. The default work center code is also determined by the work order routing. The work center setup, run, and burden rates are used by the system when it calculates costs and creates GL transactions.

Project. A project field is available for expense tracking by project.

Operation Complete, Move Next Operation, Previous Ops Complete. An operation is set to Complete status automatically during labor feedback transactions. This status change occurs when the work order quantity is finished at the current operation and the Move to Next Operation and Operation Complete fields are set to Yes.

- The defaults are Yes for Operation Complete, Move to Next Operation, and Previous Ops Complete. The Move to Next Operation default setting can be changed in the Shop Floor Control File.

Quantity Completed. The quantity completed is the number of good units produced. It is used in calculations for variances, work center efficiency, and GL transactions.

Rejects. The quantity rejected is the number of nonconforming units produced that cannot be moved to the next operation. It is not used for calculating variances, work center efficiency, or GL transactions.

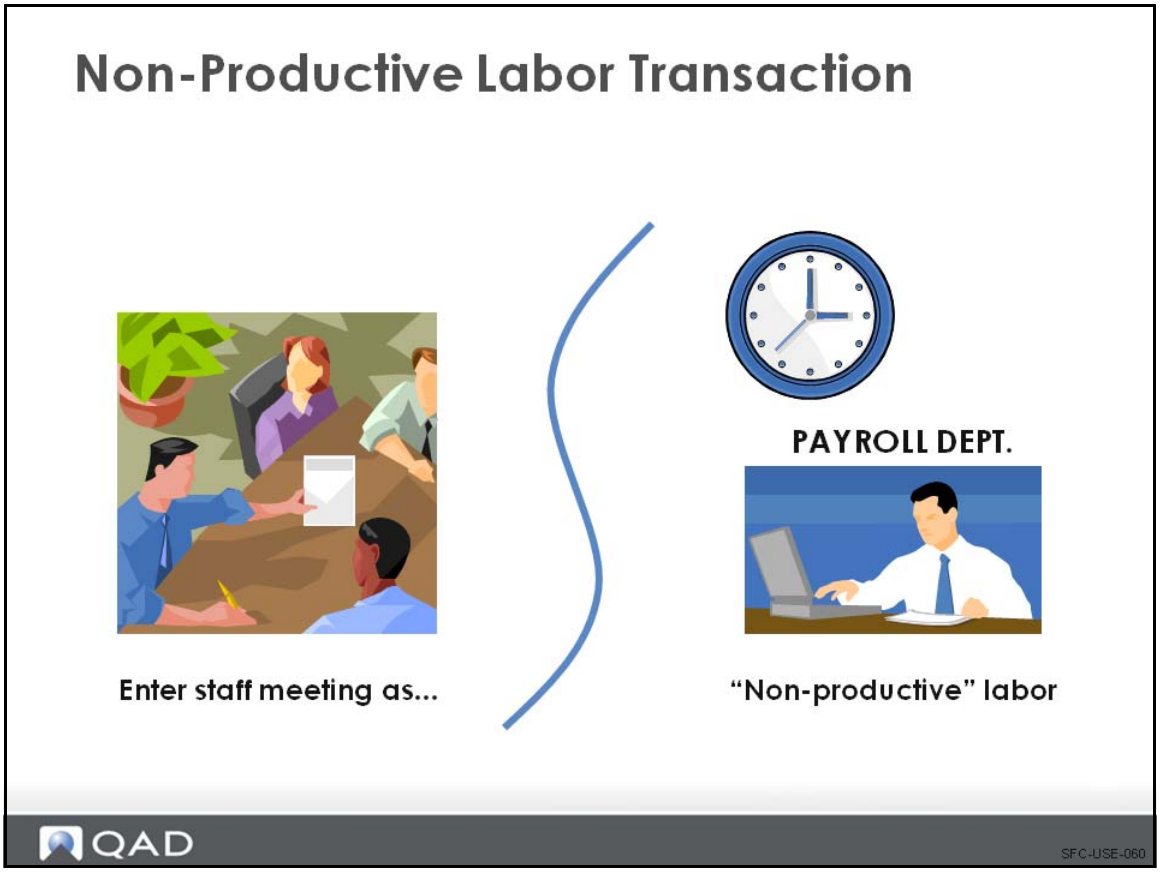
If the quantity rejected is going to reduce the expected receipt quantity significantly, then use Work Order Maintenance to reduce the order quantity to the expected quantity so that MRP can review and plan for this shortfall. Burden will be applied to all down-time hours entered here. This down time is not associated with the work order in QAD Enterprise Applications.

Rework. The quantity reworked is the number of unacceptable units requiring additional processing. It is not necessary that all of these result in good units that can be moved to the next operation. Like the quantity rejected, it is not used for calculating variances, work center efficiency, or GL transactions.

Start Setup, Elapsed/Stop Setup, Start Run, Elapsed/Stop Run. When entering labor time, enter either the start and stop times or the elapsed labor time. Time may be reported in either decimal or in hour/mins. format. The format can be specified on each labor reporting transaction; however, a default is set up in the Shop Floor Control File.

Down Time. Non-productive labor can be entered with the reason code assigned to this down time. Down time is entered in elapsed time.

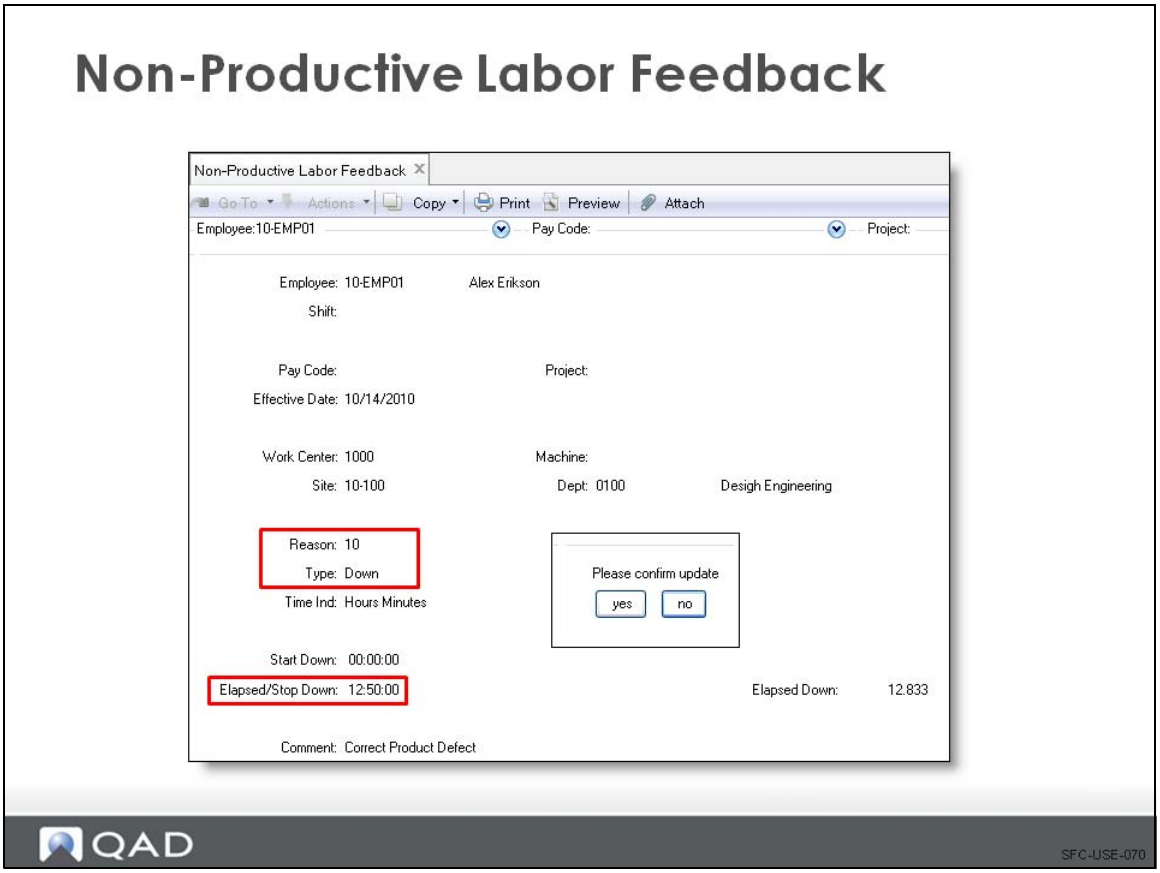
Enter Non-Productive Labor Feedback Transactions



Use Non-Productive Labor Feedback to enter indirect labor time for such activities as preventive maintenance, machine breakdown, waiting for work, repairing tools, cleaning, and meetings.

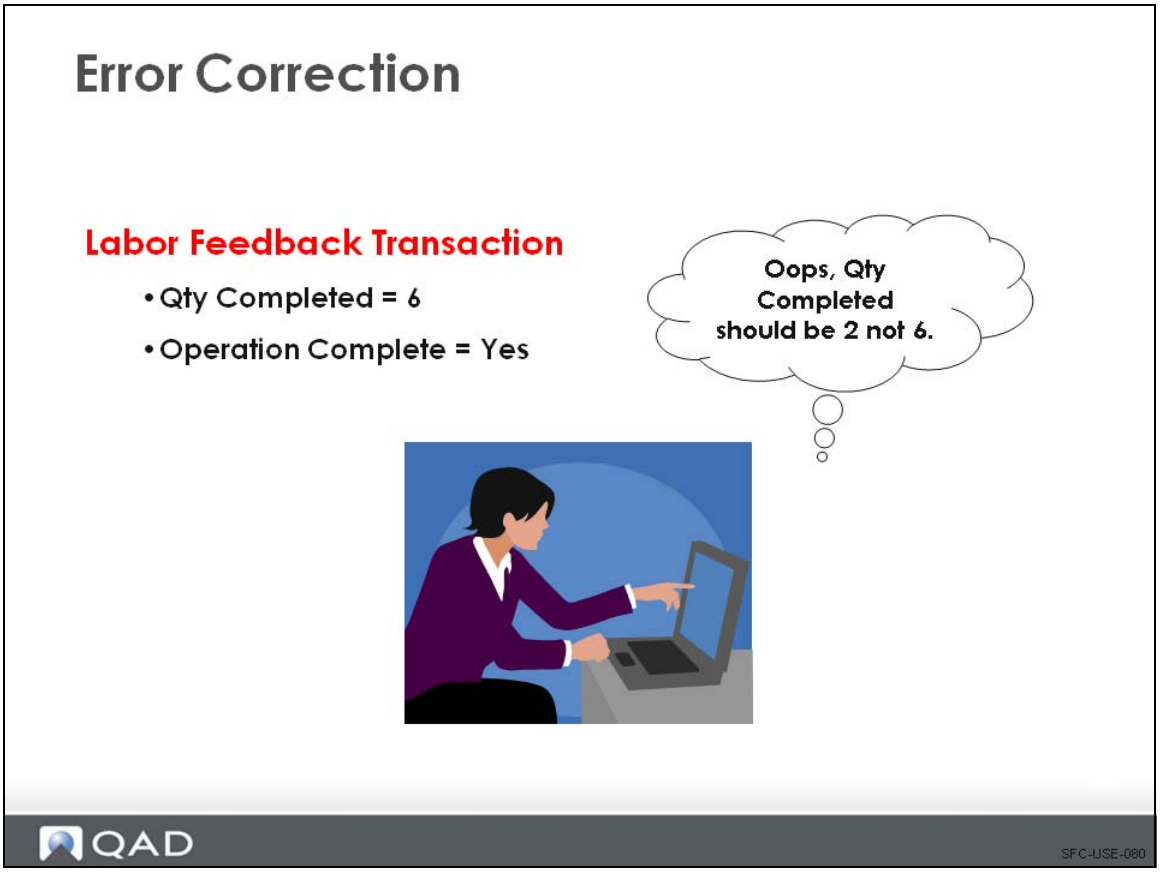
Indirect labor transactions are important if SFC labor reporting is used for payroll purposes - when it is necessary to account for all of an employee's time – and for efficiency and utilization reports.

Non-Productive Labor Feedback

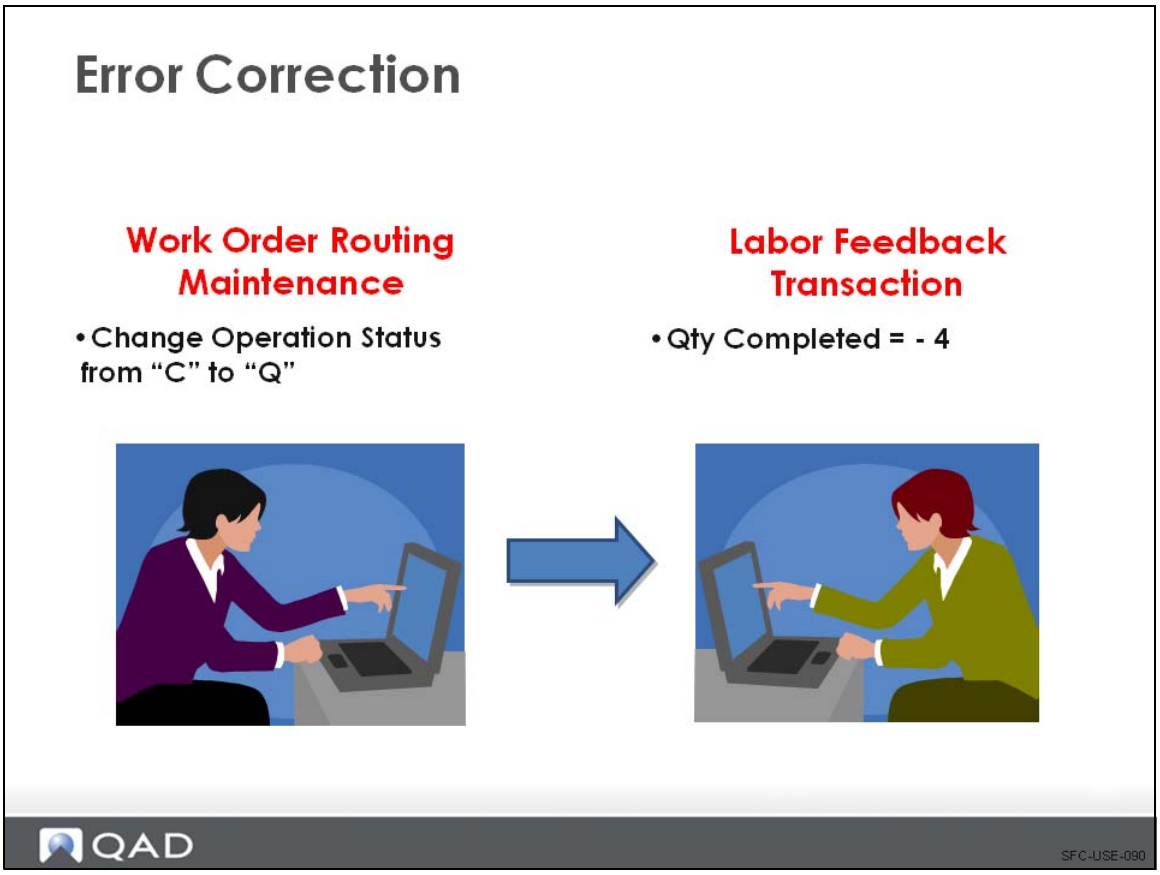


Reason. Non-productive labor feedback transactions reference reason codes set up in Reason Codes Maintenance with a reason type of Down. Shop floor reports use this information to calculate utilization and efficiency.

Error Correction



Operations that have been processed as complete in Labor Feedback transactions may not be directly modified or deleted. However, you can re-enter a second transaction with a negative value to reverse the effect of the incorrect transaction.



To make a correction:

- If the work order is still open, change the status of the operation from Complete to Queue in Work Order Routing Maintenance.
- In Labor Feedback, enter a negative quantity or negative elapsed time, depending upon the error, to reverse the effect of an incorrect transaction

If the work order is closed, reopen the work order in Work Order Maintenance first, then follow the steps above.

Exercise: Labor Transactions Reporting

Create Inventory

Note Direct the output for all reports to Page.

1. Use Receipts Unplanned (3.9) to receive the following components into location 020, site 10-200:
   - 10 rolls of Item 62050
   - 10000 EA of item 90031
2. Use Inventory Detail by Item Browse (3.2) to view your on-hand inventory balances of the two items.

Create and Release Work Orders

1. Use Work Order Maintenance (16.1) to create the following work orders at site 10-200:
   - Two work orders for item 02003, both for 100 units and due this coming Friday.
   - Two work orders for item 02003, both for 100 units and due a week from this coming Friday.
   - A work order for 100 units of item 02003, due two weeks from this coming Friday.
2. Use Work Order Browse (16.2) to review your orders.
3. Use Multiple Work Order Release and Print (16.7) to release your orders.

   Select your orders by entering today's date in the first Release Date field and leaving the second Release Date field blank. Note the status field defaults to F - firm planned, so that orders with status E will not be selected.

Review Work Orders

1. Use Work Order Browse (16.2) to review your orders. Note the status change.
2. Use Work Order Dispatch Report (16.18) to view your work orders for site 10-200.
   - Set the window days to cover the periods your work orders are scheduled in.
   - Note the Operation Status of each operation of each order.

Report Labor

The following activities use the Labor Feedback by Work Order function, you could also use either Labor Feedback by Work Center, or Labor Feedback by Employee. All these functions work the same and all require a Work Order number, an Employee code and a Work Center as the key fields.

Report Labor at Operation 10

1. In Labor Feedback by Work Order (16.20.1), use the lookup icon to find your first order due this Friday.
2. Enter operation 10.

3 Use employee 10-EMP02.

4 Note this function does not show the standard times for the operations. If you need to see the standard times for any operation, use Work Order Routing Maintenance (16.13.13).

5 Note the Quantity Completed defaults to the order quantity.

6 Report Elapsed Setup Time of 0.25 hrs.

7 Report Elapsed Run Time of 3.3 hrs.

8 Confirm that all information is correct.

9 Note the message line at the bottom of the frame saying the operation has been moved. What does that mean?

10 Use Operation Transaction Browse (16.20.13.8) and Operation Transaction Detail Inquiry (16.20.13.9) to review the transaction just completed. Use the up/down arrows to scroll through the transactions.

Report Labor at Operation 20

1 Use Labor Feedback by Work Order (16.20.1) to report labor against the same order due this coming Friday.

2 Enter operation 20.

3 Report 100 units complete and elapsed run time of 3.3 hrs.

4 This operation has no setup time.

Report Labor at Operation 30

1 Use Labor Feedback by Work Order (16.20.1) to report labor against the same order due this coming Friday.

2 Enter operation 30, report 99 units complete.

3 Uncheck the box for Operation Complete. This will leave the operation in Running status.

4 Check the box for Rejects, enter elapsed run time of 10 hrs.

5 This operation has no setup time.

6 Click Next, a pop-up box appears to record the reject.

7 Select Configuration - Out of Spec and record one unit.

8 Click Next, and then Back; then Confirm all information is correct.

9 Use Operation Transaction Detail Inquiry (16.20.13.9) to review the transaction just completed. Note the costs are at standard, but only 99 units have been completed.

Report Non-Productive Labor

Use Non-Productive Labor Feedback (16.20.4) to report downtime that has idled the worker.

1. Use employee 10-EMP02 at work center 1000 at site 10-200.
2. Use the lookup icon to select downtime reason “Mat 1”.
3. In the elapsed time field enter 1.5 hrs.
4. In the comments field enter: Waiting for rework material.
5. Confirm all information is correct.

Report Rework at Operation 30

The rework material has arrived and we have reworked the reject unit and need to report that and close the operation.

1. Use Labor Feedback by Work Order (16.20.1) for operation 30 of your order due this coming Friday.
2. Enter Quantity Completed as 1, check boxes for Rework and Operation Complete.
3. Enter 1 hr for elapsed run time.
4. In the comment field, enter: Reworked unit with new package.
5. Click Next. A pop-up box appears for you to enter quantities and reasons for rework.
6. There is only one reason code available for rework. Record the reason for the reworked unit.

   Note If you failed to uncheck the Operation Complete box in the previous step you will get a message “Operation Closed” and not be able to proceed. To correct this use Work Order Routing Maintenance (16.13.13) to change the operation status from C, Closed to R, Running.
7. Confirm all information is correct.
8. Use Work Order Browse (16.2) to review your orders. Note the status is R, Running.

Run Reports

1. Use Work Order Cost Report (16.3.4) to view the cost of the order.
2. Use Work Order WIP Cost Report (16.3.5) to view the values in WIP.

Receive Work Order

Use Work Order Receipt Backflush (16.12) to receive your work order into finished goods inventory and to backflush the components used to make the items.

1. Enter your work order number. Note the receive and backflush boxes are checked indicating you will do both transactions. Click Next.
2. Enter the quantity 100, the default location into which these items will be received should be 010. Click Next.

3 Make sure to set Close to Yes to indicate you are done with the order and want to change its status to C, Closed. Click Next.

4 Choose Yes to view transaction detail and confirm all information is correct.

5 On the backflush screen, leave the default quantity to backflush at 100 and click Next three times to proceed to the Component Issue Detail screen. The system pre-fills the screen with the standard quantities and items for 100 of the end item.

6 You used one extra package in reworking the unit. Find item 90031 in the item number field of the second frame and click it, change the quantity to 202; then click Next.

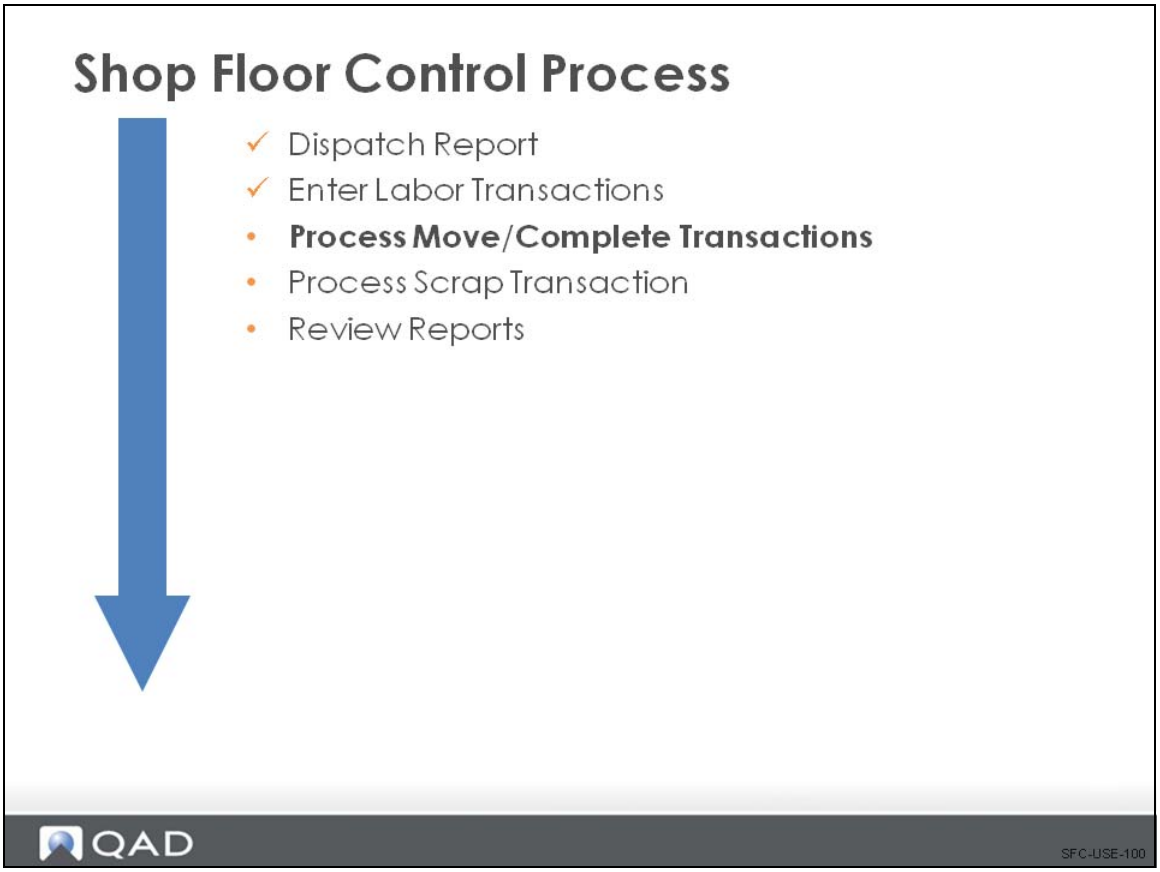
7 Click Back; then choose Yes to display items being issued.

8 Verify the quantities are correct and all are being issued from location 020.

9 Proceed to confirm that all information is correct and confirm update.

10 Use Inventory Detail by Item Browse (3.2) to check the status of your inventory. You will see the 100 each of item 02003 at site 10-200, and the component quantities reduced by the numbers you backflushed.

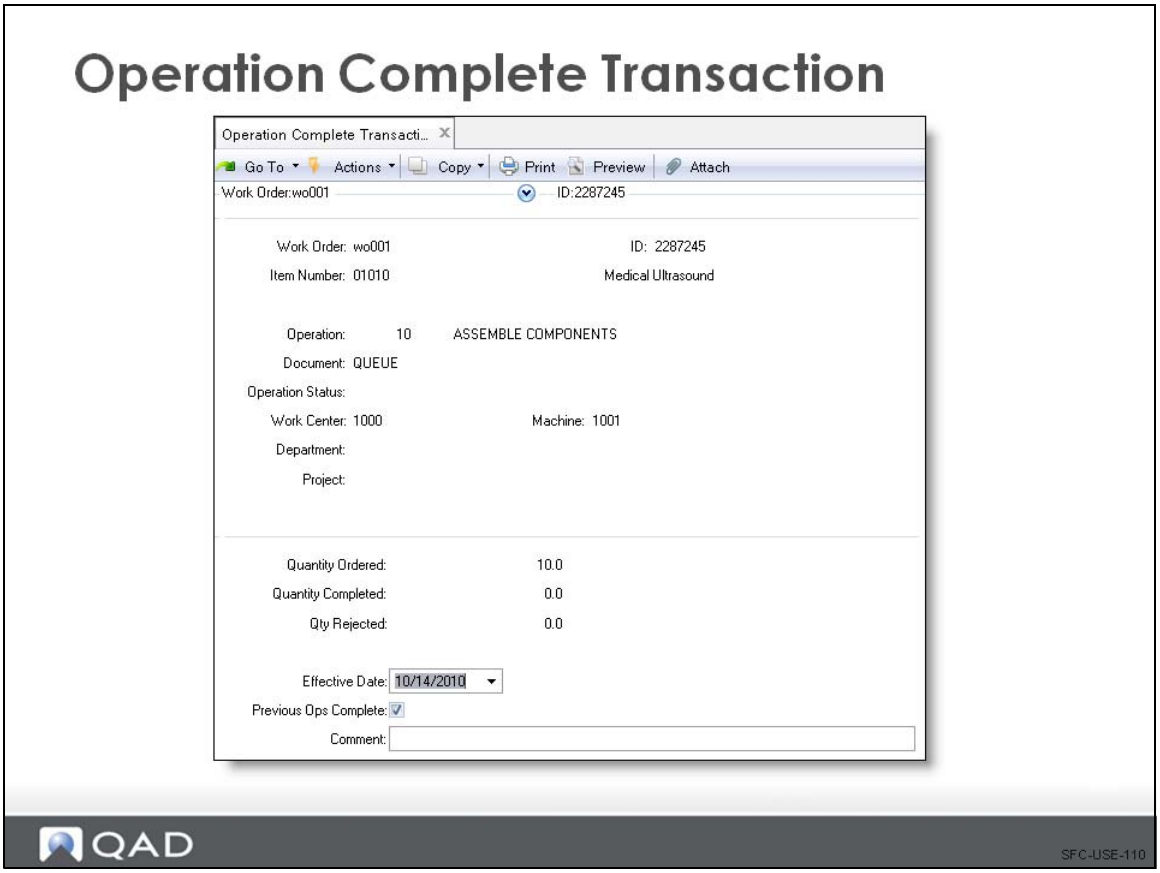
Process Move/Complete Transactions



The Operation Move Transaction and Operation Complete Transaction provide additional control over the movement of orders from operation to operation. These transactions would typically be used for:

- Error correction
- Quality control checkpoints
- Control of work center queues

Operation Complete Transaction

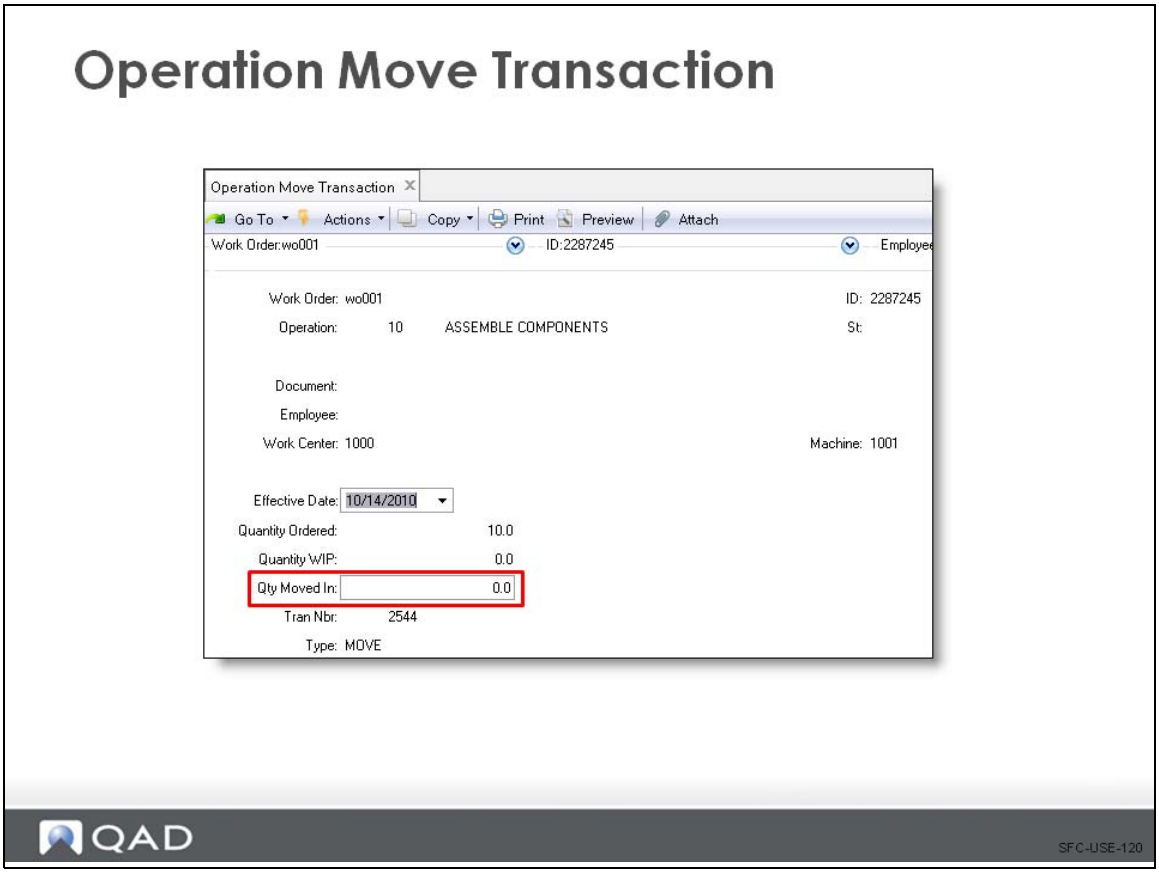


Operation Complete Transaction is an alternative way to close an operation. Current operations and all preceding open operations can also be closed in Labor Feedback.

Note In Operation Complete Transaction, you cannot enter the quantity completed. The quantity completed for a given operation must be entered in one of the Labor Feedback transaction screens.

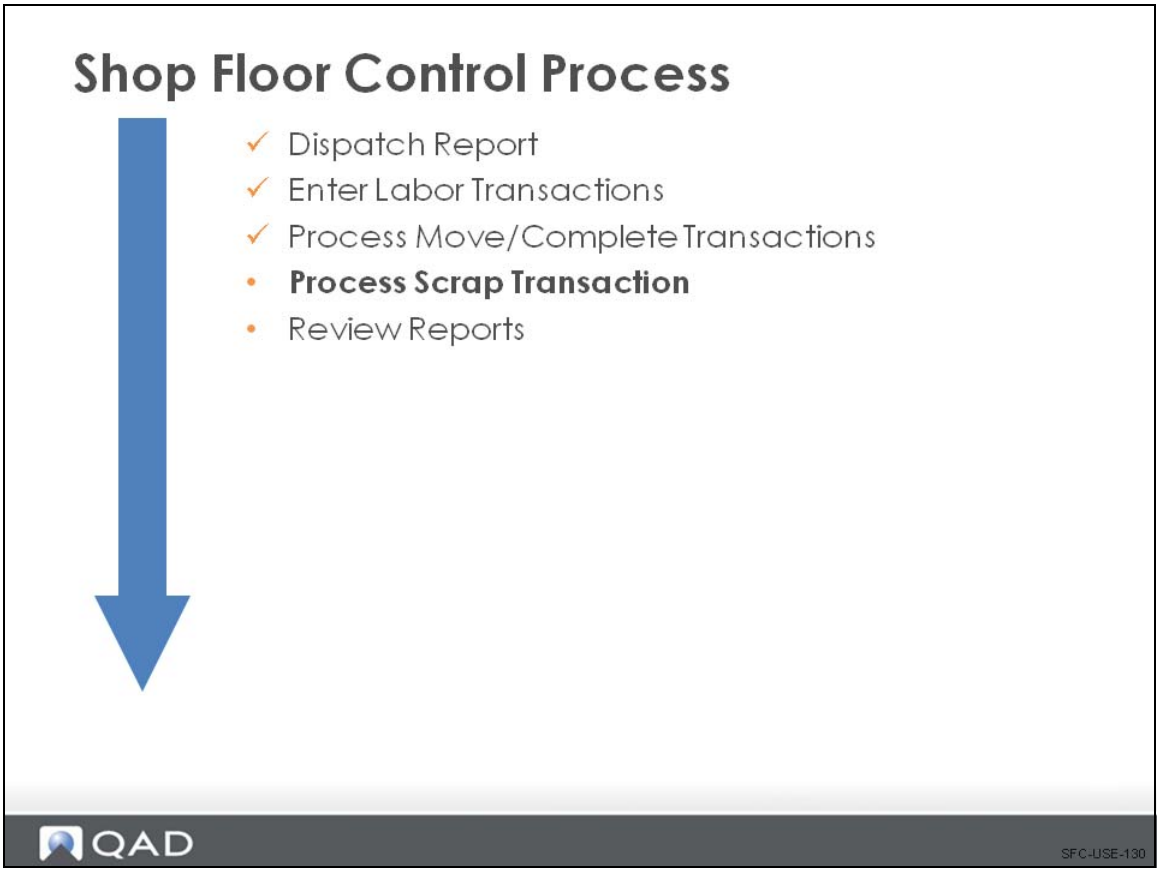
Current and previous operations are closed in Operation Complete Transaction only with the quantity accepted in Labor transactions.

Operation Move Transaction



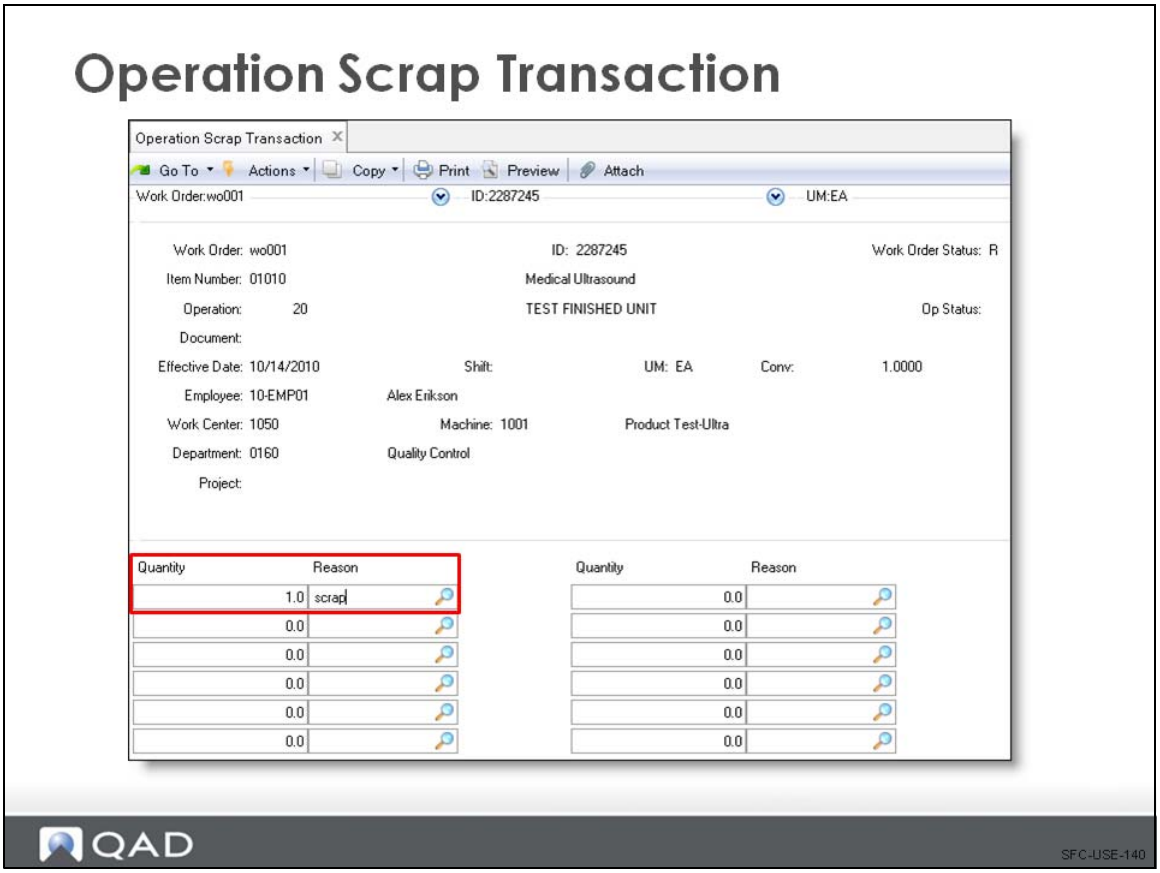
Operation Move Transaction moves an order to an operation and facilitates manual control of work center queues.

Process Scrap Transactions



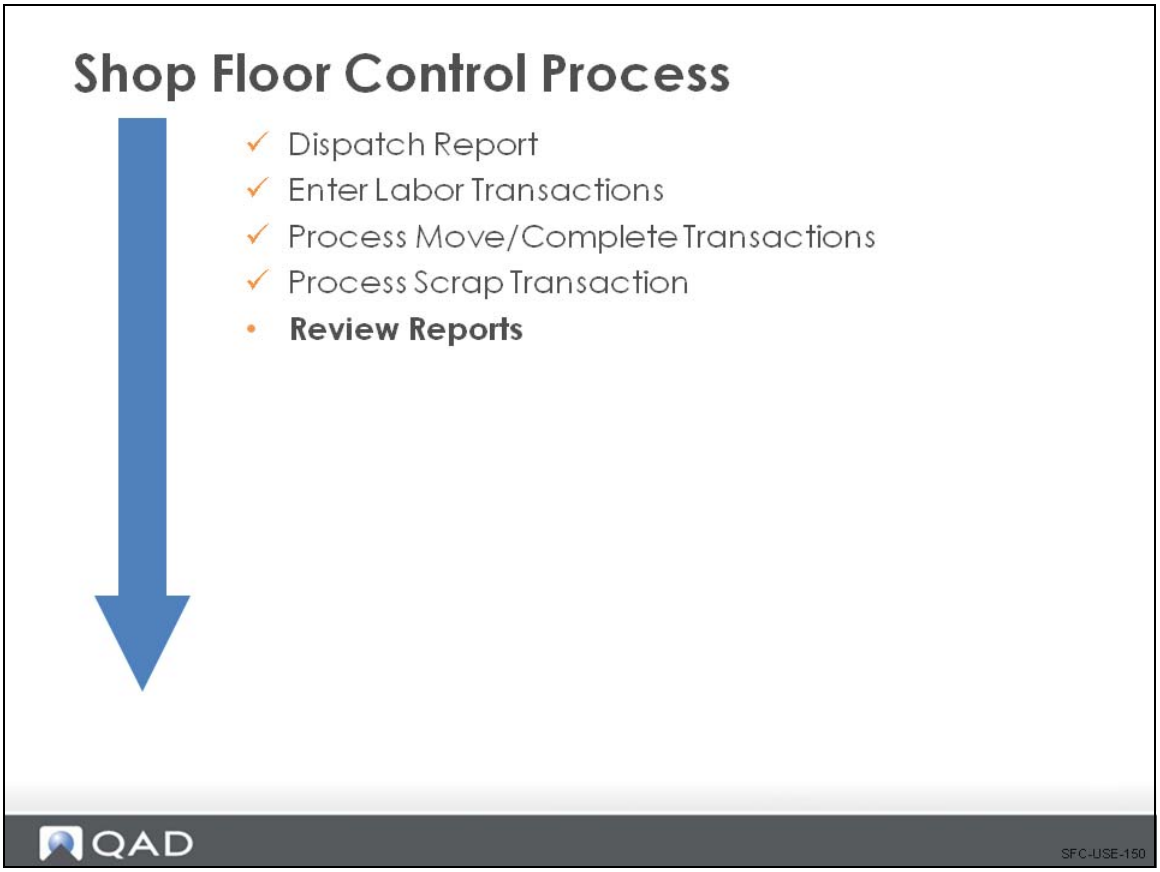
Use Operation Scrap Transaction to scrap partially completed finished-goods items at any work order operation. This generates WO-SCRAP operation history records but has no effect on GL accounts.

Operation Scrap Transaction



This program does not record finished material scrap. Use Work Order Receipt to do this.

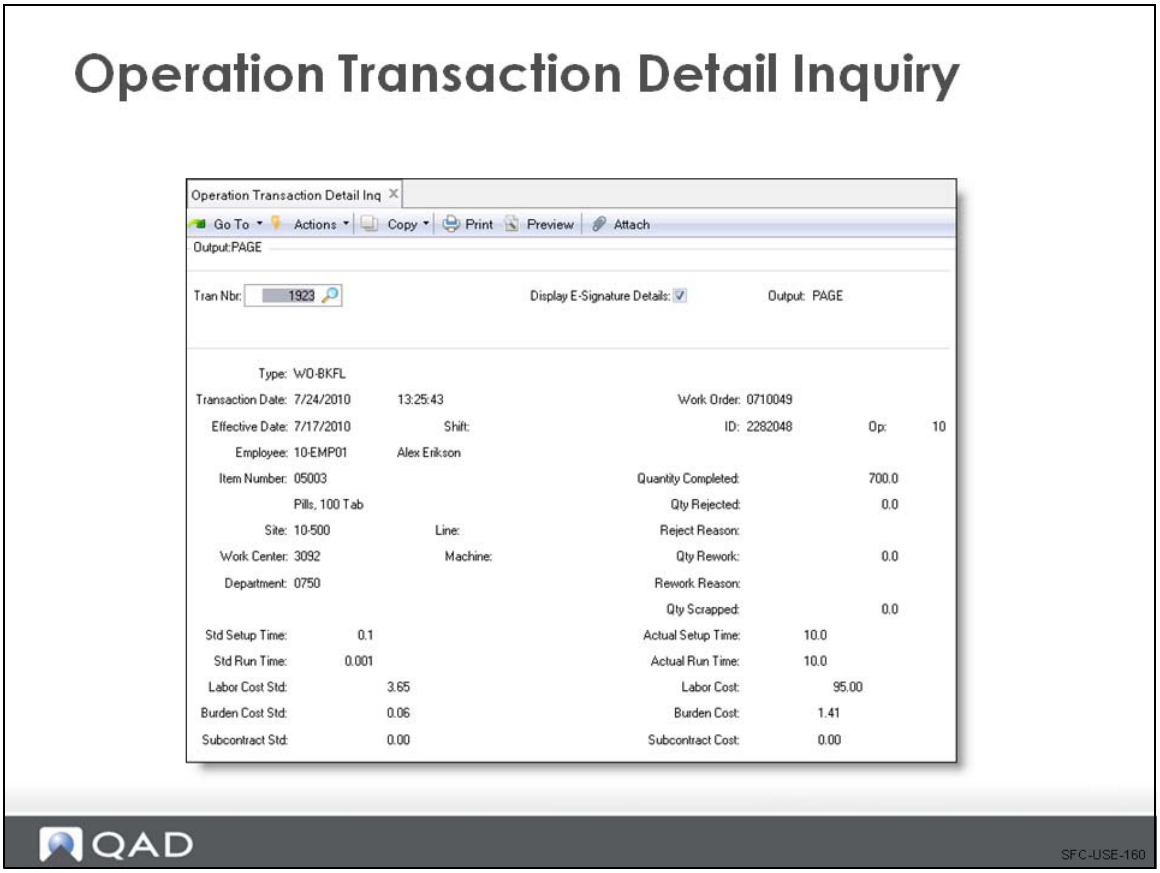
Review Reports



Reports are a key output of shop floor control, which produces labor reporting that can be divided into several categories:

- Transactions
- Down time
- Input/output
- Utilization and efficiency

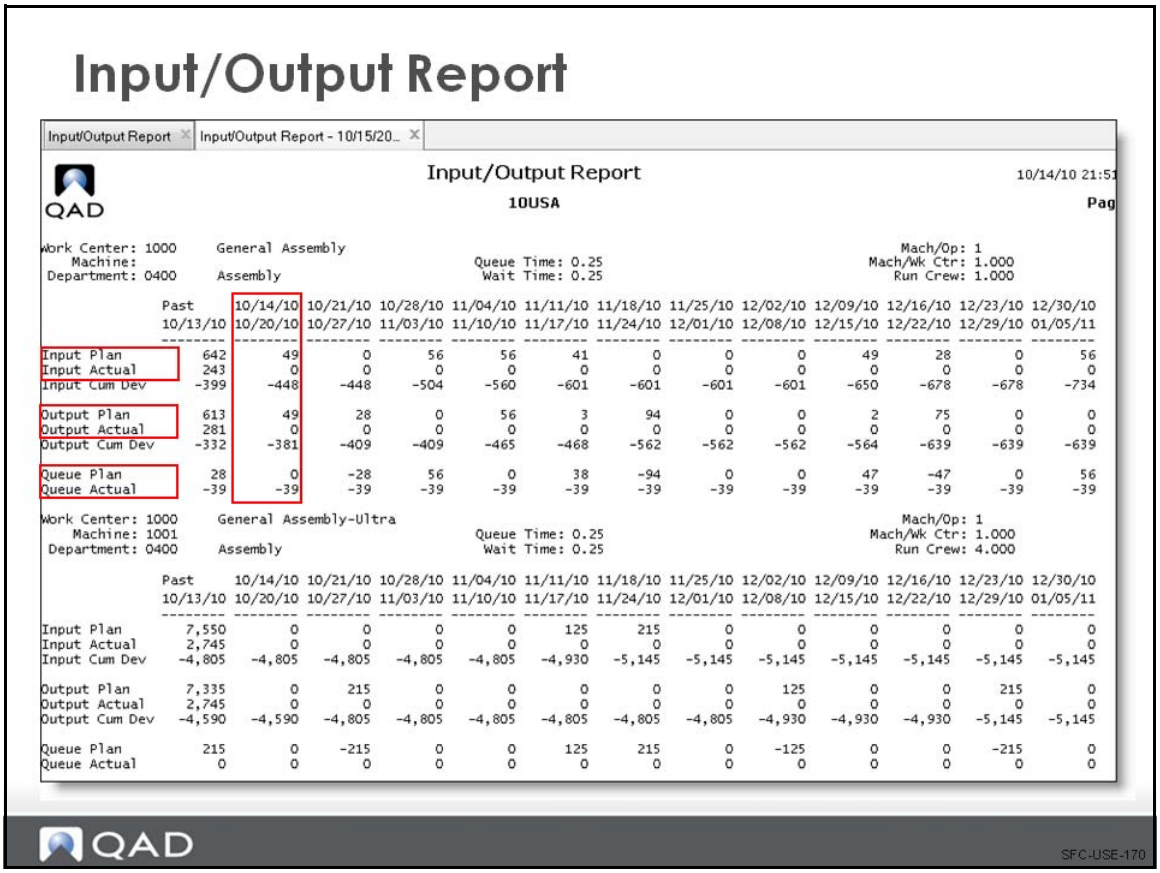
Operation Transaction Detail Inquiry



The system creates transactions when using the functions that record labor feedback, non-productive labor, down time, and the completion of operations. The data from these transactions can be reported by:

- Work center,
- Work order, or
- Employee

Input/Output Report



The Input/Output Report is one of the primary tools for monitoring the load at work centers and finding bottlenecks. It allows a manager to compare planned input and output at a work center with actual input and output, by time period. These reports calculate planned input and output from the work order operations based on their start dates, standard setup and run times, and the shop/work center calendar. Actual input and output are obtained from the operation history transactions; the quantities moved to a work center are used to determine input and the quantities completed at a work center for output.

You can display planned and actual input and output in daily, weekly, or monthly periods.

Planned Input. Planned input is load on a work center or machine represented by work order operations scheduled to start in a reporting period.

It is determined using the following calculations:

Standard Setup + (Standard Run X Quantity Ordered)

Actual Input. Actual Input is load that has been moved to the first and subsequent order operations. It is calculated for a reporting period based on move transactions entered using work order release and shop floor control functions.

Actual input is determined using the following calculation:

Standard Setup + (Standard Run X Quantity Moved)

Planned Output . Planned output is load calculated based on order operations scheduled to be completed in a reporting period.

It is determined by using the following calculation:

Standard Setup + (Standard Run X Quantity Ordered)

Actual Output . Actual output is load calculated for a reporting period based on operation quantity completed transactions for work orders and repetitive schedules. You can report completed quantities for order operations using labor feedback transactions in the Shop Floor Control.

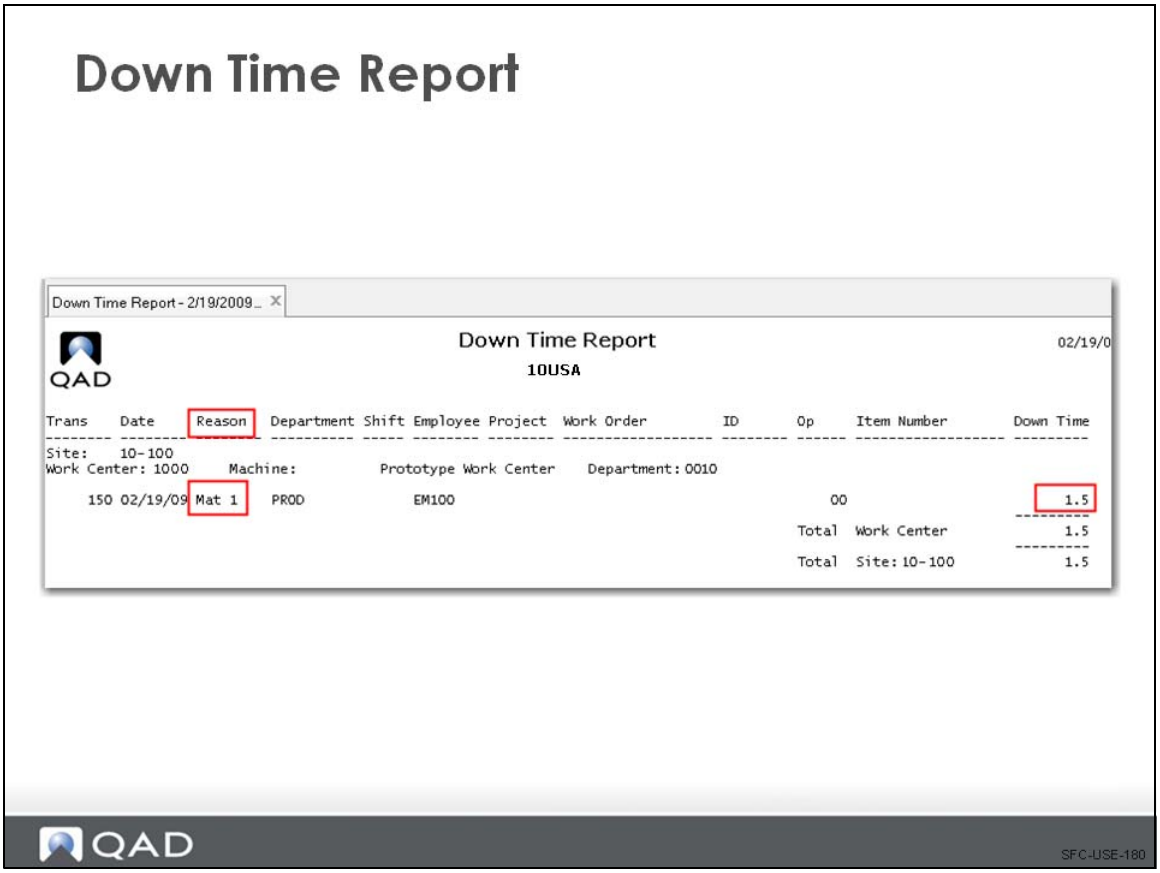
Actual output is determined using the following calculation:

Actual Setup + (Standard Run X Quantity Completed)

Planned Queue . The difference between planned input and planned output

Actual Queue . The difference between actual input and actual output

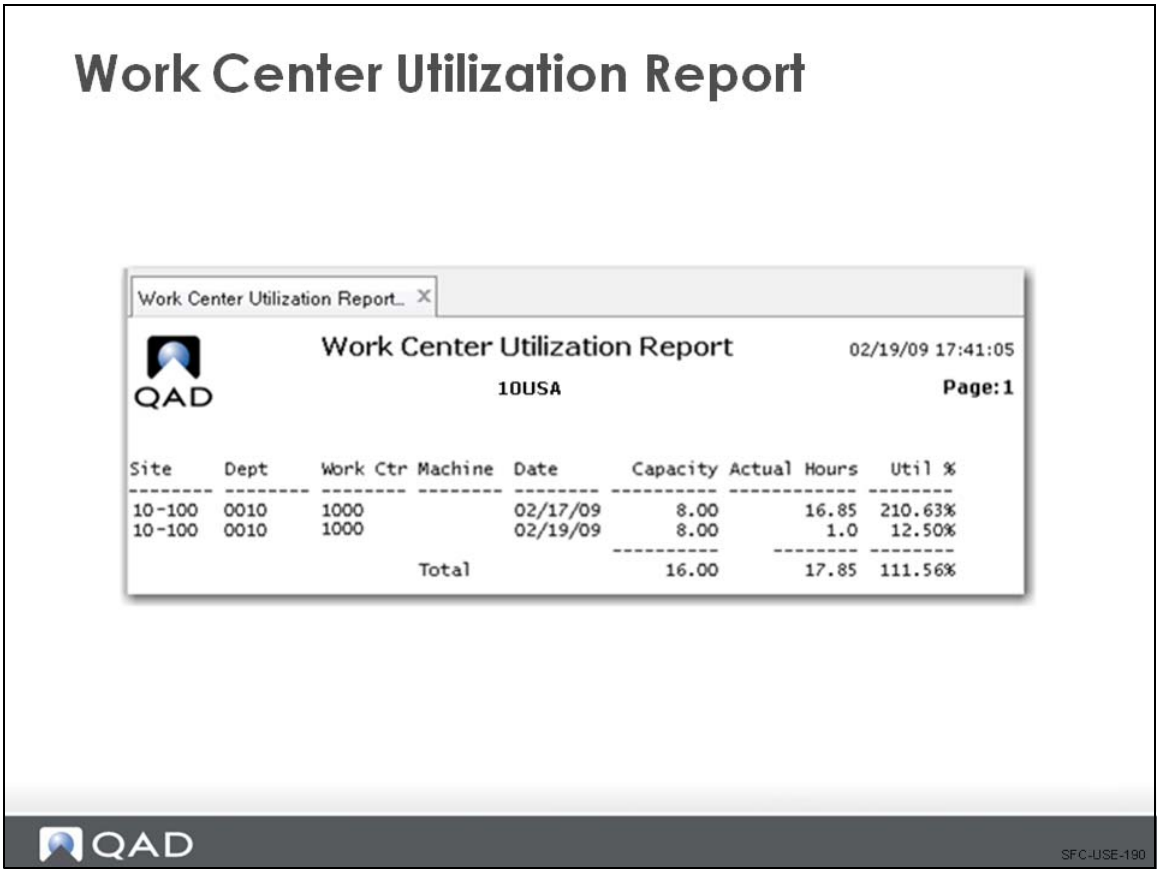
Down Time Report



Use Down Time Report to produce a report on down time by:

- Site,
- Work center,
- Machine,
- Employee,
- Effective date,
- Work order, or
- Work order ID number.

Work Center Utilization Report

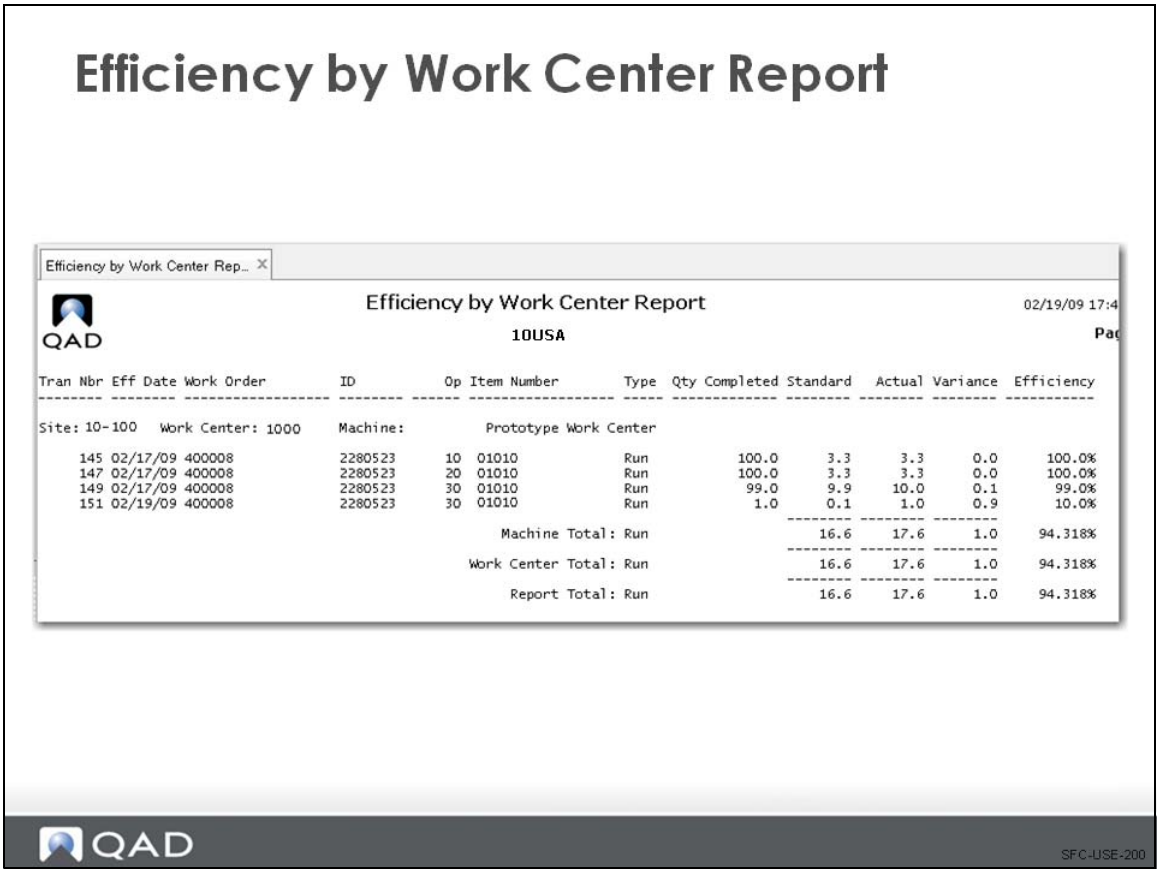


Use Work Center Utilization Report to produce a report on work center or machine capacity utilization based on labor reporting. This report identifies bottlenecks or underused work centers and shows how the hours in the work day are being used.

The Work Center Utilization Report calculates work center or machine utilization by dividing the total number of hours worked (recorded through transactions) by the total number of hours available to be worked (as calculated from the shop calendar) and multiplying the result by 100.

Utilization is one of two key measures that managers use to measure performance.

Efficiency by Work Center Report



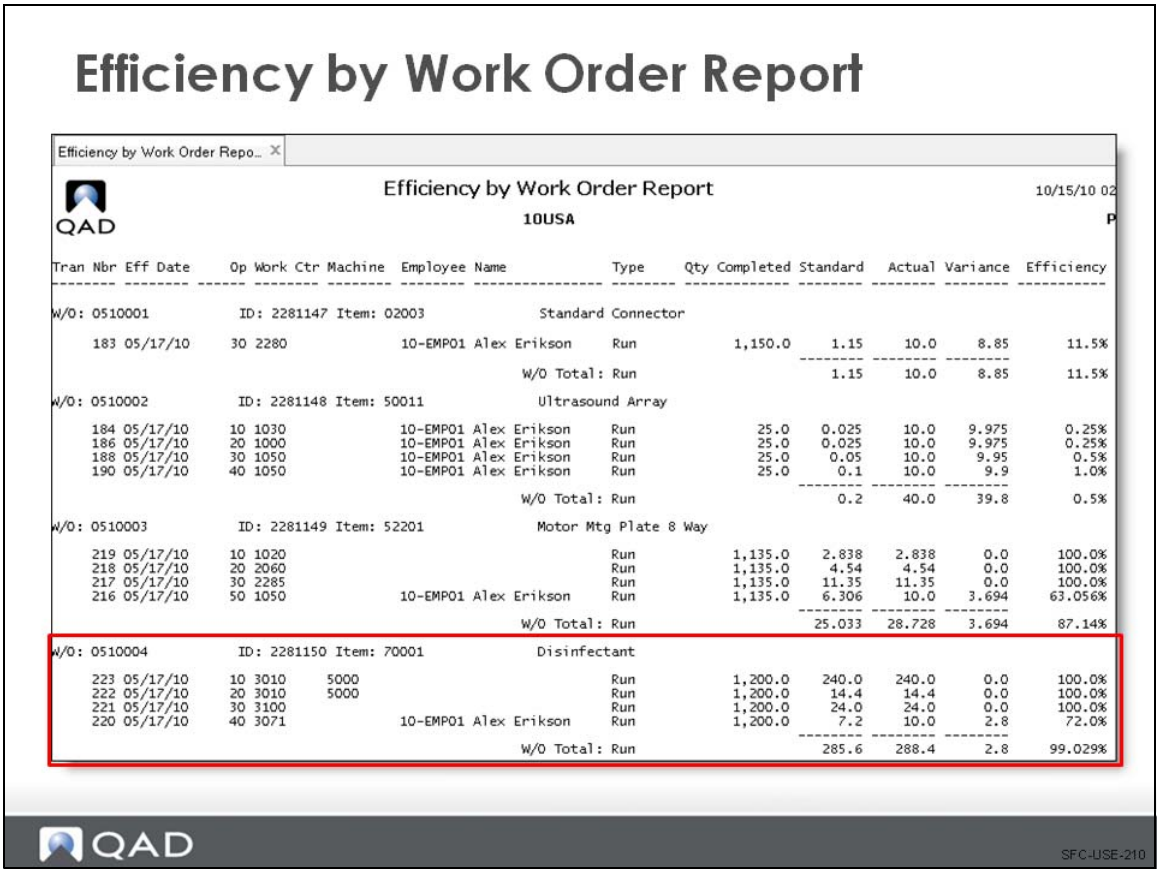
Efficiency reports help identify problems with routing standards and show how effectively labor is being used. Operation efficiencies are calculated by dividing the total number of standard hours earned (by completing units at operations) by the total number of hours worked and multiplying the result by 100. This data may be sorted by work order, work center or machine, or employee for any time period. Efficiency is one of two key measures that managers use to measure performance.

The Efficiency by Work Center Report lists the following in transaction sequence by work center:

- Transaction number and date
- Work order number
- Operation
- Employee number and name
- Labor type (setup or run)
- Quantity completed
- Standard, actual and variance hours
- Setup and run efficiency percentages

Setup and run totals are provided by work center or machine.

Efficiency by Work Order Report



Efficiency by Work Order Report shows, by ascending work order number, setup and run information by operation. It lists the following:

- Work order item number and description
- Quantity:
  - OrderedOpen
  - In WIPCompleted
  - RejectedReworked
- Work order status
- Actual setup and run hours
- Standard setup and run hours
- Setup and run variance hours
- Setup and run efficiency in percentages

Exercise: Reporting Labor

Use the Dispatch report to organize your work for this exercise and keep the tab on your work space.

1 Use Labor Feedback by Work Order (16.20.1) to report the three operations for your other work order due this Friday at standard times. The standard times for each operation are:

Op. 10	0.25 hr setup	3.3 hrs run
Op. 20	3.3 hrs run	
Op. 30	10.0 hrs run	

2 Use Work Order Receipt Backflush (16.12) to receive your work order into finished goods inventory and to backflush the components used to make the items. Be sure to close the order.

3 Use Labor Feedback by Employee (16.20.2) to report the three operations of one of your orders due a week from Friday. Use employee 10-EMP02. Charge 1.0 hrs setup on operation 10 and 4.0 hours run time on operation 20.

4 Use Work Order Receipt Backflush (16.12) to receive your work order into finished goods inventory and to backflush the components used to make the items.

5 Use Labor Feedback by Work Center (16.20.3) to Report the three operations on the other order due a week from Friday. Charge no setup time on operation 10 and reject 5 units at operation 20. Charge 9.5 hours at operation 30.

6 Use Work Order Receipt Backflush (16.12) to receive your work order into finished goods inventory and to backflush the components used to make the items. Receive 95 units, scrap 5 units and backflush all components.

7 Use Labor Feedback by Work Center (16.20.3) to Report the first two operations on the order due two weeks from Friday. Report operation 10 and 20 at standard. Leave the order open at operation 30.

Review Labor Reports

Direct the output for all reports to page use the up arrow in the output field to select page. As you have only one work center, one employee and a very limited set of work orders most reports can be run with the selection criteria left blank.

1 Use Input/Output Inquiry (16.20.13.11) to see what your work center efforts looks like so far.

2 Use Input/Output Report (16.20.13.12) to note the differences between the report and the inquiry.

3 Use Operations by Work Center (16.20.13.13) to see which operations have been reported and which are still open.

4 Use Operations by Work Order (16.20.13.14) which shows the same information in a different format. Which would be more useful in your business?

5 Use Down Time Report (16.20.13.16) and Down Time by Reason Report (16.20.13.17) to review the difference between the two.

6 Use Work Center Utilization Report (16.20.13.18) to review your work centers utilization.

7 Use Efficiency by Work Center Report (16.20.13.19) to review your work centers efficiency.

8 Use Work Order Cost Report (16.3.4) to review the costs charged to your work orders.

Note Specific details of product and work order costing, and variances are covered in the Product Costing Course.

Summary


Summary
✓ Dispatch Report
✓ Enter Labor Transactions
✓ Process Move/Complete Transactions
✓ Process Scrap Transactions
✓ Review Reports
QAD
SFC-USE-230

Appendix A

Study Questions

1 Explain the meaning of “operations are back-scheduled from the MRP due date.”

2 Explain the Dispatch Report.

3 Give an example of non-productive labor feedback.

4 All planned orders are automatically scheduled by MRP with respect to their release and due dates.

True False

5 The Move Next Operation field is set to Yes in the Shop Floor Control File. This setting will place the operation in setup (S) status.

True False

6 MFG/PRO will track the quantity completed at each operation as the work order progresses through its routing.

TrueFalse

7 A purchase order line item with a Type field set to S refers to a subcontract operation.

TrueFalse

8 If you are tracking WIP, are employee records required?

9 Do Holidays always impact the entire site?

10 What is the impact of not posting variances in Shop Floor Control?

Answers to Study Questions

1 In QAD Enterprise Applications, Operation Scheduling starts scheduling at the last operation and, working back from the due date, assigns operation start and stop dates for each operation in the routing.

2 The Dispatch Report is a list of all work orders scheduled at or to arrive at a work center. The work orders are listed in ascending sequence (earliest start date first) by operation start date.

3 Examples of non-productive labor feedback are machine breakdown, waiting for work, repairing tools, cleaning, or meetings.

4 True.

5 False. The Move Next Operation field setting of Yes places the operation in queue (Q) status.

6 True.

7 True.

8 Yes, at least one.

9 No, holidays can be work center-specific.

10 Fewer GL transactions, easier to balance GL on work orders with long run times.

Appendix B

General Ledger Effects

GL Consequences of Shop Floor Transactions

General ledger (GL) transactions are created automatically by shop floor control with a prefix of WO. Shop floor control uses Department Maintenance to identify accounts for GL posting. These accounts are labor, burden, cost of production, and labor variances. During operation completion, there is an option to complete previous operations. If this option is selected, all previously unreported operations are posted using standard labor hours.

All transactions are created using the standard setup and labor rates from the work center. Burden is posted using the standard burden rates for the work center. Labor costs are posted to the WIP account/cost center. Downtime and non-productive labor post to the Cost of Production account/cost center. The GL accounts are taken from the department of the work center. If variances are calculated at shop floor control, then labor usage and burden usage variances are calculated.

The following table provides more detailed information on GL effects.

Function	Notes	DR / CR	Account	Defaults From
Labor Feedback by Work Order, Employee, Work Center	Actual labor	DR	Work in Process	Work Order Maintenance
		CR	Labor Absorbed	Department Maintenance
	Labor rate variance	DR	Labor Rate Variance	Department Maintenance
		CR	Work in Process	Work Order Maintenance
	Labor usage variance	DR	Labor Usage Variance	Department Maintenance
		CR	Work in Process	Work Order Maintenance
	Actual burden	DR	Work in Process	Work Order Maintenance
		CR	Burden Absorbed	Department Maintenance
	Burden rate variance	DR	Burden Rate Variance	Department Maintenance
		CR	Work in Process	Work Order Maintenance
	Burden usage variance	DR	Burden Usage Variance	Department Maintenance
		CR	Work in Process	Work Order Maintenance
Non-productive Labor Feedback		DR	Cost of Production	Department Maintenance
		CR	Labor	Department Maintenance
		CR	Burden	Department Maintenance
Operation Complete Transaction	Actual Labor	DR	Work in Process	Work Order Maintenance
		CR	Labor Absorbed	Department Maintenance
	Labor rate variance	DR	Labor Usage Variance	Department Maintenance

Function	Notes	DR / CR	Account	Defaults From
		CR	Work in Process	Work Order Maintenance
	Labor usage variance	DR	Labor Usage Variance	Department Maintenance
		CR	Work in Process	Work Order Maintenance
	Actual burden	DR	Work in Process	Work Order Maintenance
		CR	Burden Absorbed	Department Maintenance
	Burden rate variance	DR	Burden Rate Variance	Department Maintenance
		CR	Work in Process	Work Order Maintenance
	Burden usage variance	DR	Burden Usage Variance	Department Maintenance
		CR	Work in Process	Work Order Maintenance

Appendix C

Reports, Inquiries, Browses

Shop Floor Control
Inquiries and Reports

Inquiry	Function / Purpose
Operation Transaction Browse	Displays a list of operation transactions by operation.
Operation Transaction Detail Inquiry	Displays a list of the detail for an operation transaction. (See “Operation Transaction Detail Inquiry” on page 85.)
Operations Accounting Report	Shows the GL transactions resulting from discrete manufacturing down time and labor transactions. Note that a similar report is available for Repetitive down time and labor transactions.
Input/Output Inquiry	Displays a list of the actual and planned standard hour input, output, and queue for a work center/machine.
Input/Output Report	Displays a summary report of the actual and planned standard hour input, output, and queue for a work center/machine. (See “Input/Output Report” on page 86.)
Operations by Work Center Report	Produces a report on operation transactions by work center/machine.
Operations by Work Order Report	Produces a report on operation transactions by work order.
Operations by Employee Report	Produces a report on operation transactions by employee.
Down Time Report	Lists transactions for each work center/machine in transaction sequence by date according to user-specified parameters. Total down time is shown for each work center for the period specified. (See “Down Time Report” on page 88.)
Down Time by Reason Report	Lists down time transactions for each reason code in sequence according to user specifications. The system charges down time to the Cost of Production (COP) account. Use Operations Accounting Report to list details on the GL transactions for the COP account.
Work Center Utilization Report	Produces a report on work center/machine capacity utilization based on labor reporting. (See “Work Center Utilization Report” on page 89.)
Efficiency by Work Center Report	Lists the following in transaction sequence by work center – transaction number and date; work order number; operation; employee number and name; labor type; quantity completed; standard, actual, and variance hours; setup and run efficiency percentages. (Setup and run totals are provided by work center/machine and for the report.) (See “Efficiency by Work Center Report” on page 90.)
Efficiency by Work Order Report	By ascending work order number, shows setup and run information by operation. It lists the following – work order item number and description; quantity ordered; quantity open; quantity in WIP; quantity completed; quantity rejected; quantity reworked; work order status; actual setup and run hours; standard setup and run hours; setup and run variance hours; setup and run efficiency percentages. (See “Efficiency by Work Order Report” on page 91.)
Efficiency by Employee Report	Shows the efficiency for all setup and run transactions for an employee during the user-selected period. The report shows work order sequence by date and includes the following – transaction number and date; work order number and ID; operation and work center; labor type (setup or run); quantity completed; standard, actual, and variance hours; setup and run efficiency percentages.

Note For tracking WIP, the following reports, found in the Work Orders module, are useful: Work Order Routing Browse and Work Order Routing Report.

Appendix D

QAD Product Costing

Product Costing in QAD Enterprise Applications

A brief outline-for details refer to the course Product Costing

In the standard core product QAD Applications keep product costs in two cost sets; the current cost set and the GL (standard) cost set. Additional cost sets may be defined using functionality in the Cost Management Module.

All transactions are posted to the GL using the GL Cost Set data. In a Standard Cost environment the GL Cost set is kept fixed for a defined period of time, usually the GL fiscal year. The GL standards being reset on a regular schedule, usually the fiscal year. The GL cost set may be defined as an Average Cost using functionality in the Cost Management Module.

The current cost set may be updated automatically by the system using either the last cost (for purchase orders and work orders) or an average cost. There is an option to not have the system update current costs.

In a standard cost environment differences between the GL cost and the current cost are reported as variances, usually on a fiscal month basis. In an average cost environment costs are re-averaged as they occur and variances are not reported.

In the standard core product QAD Applications keep product costs in five cost categories in each of the two cost sets; these five categories are: Material, Labor, Burden, Overhead and Sub-Contract. Additional user defined Cost Elements may be defined as sub sets of these cost categories using functionality in the Cost Management Module.

Material costs are manually entered and are usually the purchase costs of raw materials and components.

Labor costs may be system calculated using rates defined in the Work Center records and times defined in the Route records.

Burden is variable overhead and Overhead is fixed overhead. Burden may be system calculated using rates defined in the Work Center records. Overhead is manually entered in the Item Cost record.

Sub-contract costs are entered manually and are treated as purchase costs.

The cost roll-up process begins with the Routing Cost Roll Up, and proceeds with the Product Structure Cost Roll Up. A common procedure is to do all cost setup and roll up work in the current cost set until costs are verified as correct. Costs may then be copied to the GL Cost Set. Either cost set may be frozen to prevent unintentional cost changes and to improve system response in new item cost roll ups.

Product costs may be modified at each site and may be viewed on numerous inquires and reports.