QAD Enterprise Applications
Enterprise Edition

Training Guide

Advanced Repetitive Costing

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QAD 2013.1 Enterprise Edition
Workspace: 10USA > 10USACO
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Contents

Change Summary

The following table summarizes significant differences between this document and the last published version.

Date/Version	Description	Reference
September 2013/2013.1EE	Rebranded for QAD 2013.1EE	--
March 2013/2013 EE	Rebranded for QAD 2013 EE	--
September 2012/2012.1 EE	Rebranded for QAD 2012.1 EE; Consistency edit	--
March 2012/2012 EE	Rebranded for QAD 2012 EE	--
September 2011/2011.1 EE	Rebranded for QAD 2011.1 EE	--

About this Course

Course Description

This QAD Advanced Repetitive Costing training guide has been developed to teach the differences between advanced repetitive costing and work order costing.

This guide can be taught individually or as a part of the Product Costing and Cost Management course set, which consists of an introductory class, a class covering general setup topics, and a set of classes on specialized costing topics. Most students will benefit from taking the first two classes and then selecting the additional courses that apply to their business implementation. The complete list of classes is:

- Introduction to Product Costing
- Product Costing
- Advanced Repetitive Costing
- Average Costing
- Co/By-Product Costing
- Cost Management, including Simulation and Planning
- Purchase Costing
- Work Order Costing

Course Objectives

Provides the structural framework and knowledge necessary to set up and cost item/products manufactured in an advanced repetitive environment. Includes details on subcontract manufacturing in the advanced repetitive environment.

Course Benefits

Provides the opportunity for personnel responsible for developing costs and explaining variances in an advanced repetitive environment to understand how the system works.

Audience

Finance and operations personnel who develop product costs and explain variances in an advanced repetitive environment.

Prerequisites

- *Training Guide: Introduction to Costing*
- *Training Guide: Product Costing*
- *Training Guide: Work Order Costing*
- Familiarity with the .NetUI

Course Credit and Scheduling

This course is valid for 6 credit hours. This course is typically taught in 1 day.

Virtual Environment Information

The hands-on exercises in this book should be used with the latest Enterprise Edition learning environment in the 10USA > 10USACO workspace. When prompted to log in, specify *demo* for user ID and *qad* for password.

Advanced Repetitive costing functionality is reviewed in the hands-on exercises in this book. The first exercise involves basic Advanced Repetitive transactions; subsequent exercises include variances, subcontracting, and scrap. Because this is a course on costing and not a course on Advanced Repetitive, the exercises in this book will be taking some shortcuts to minimize setup.

Additional Resources

If you encounter questions on QAD software that are not addressed in this book, several resources are available. The QAD corporate Web site provides product and company overviews. From the main site, you can access the QAD Learning or Support site and the QAD Document Library. Access to some portions of these sites depends on having a registered account.

http://www.qad.com/

QAD Learning Center

To view available training courses, locations, and materials, use the QAD Learning Center. Choose Education under the Services tab to access this resource. In the Learning Center, you can reserve a learning environment if you want to perform self-study and follow a training guide on your own.

QAD Document Library

To access release notes, user guides, training guides, and installation and conversion guides by product and release, visit the QAD Document Library. Choose Document Library under the Support tab. In the QAD Document Library, you can view HTML pages online, print specific pages, or download a PDF of an entire book.

To find a resource, you can use the navigation tree on the left or use a powerful cross-document search, which finds all documents with your search terms and lets you refine the search by book type, product suite or module, and date published.

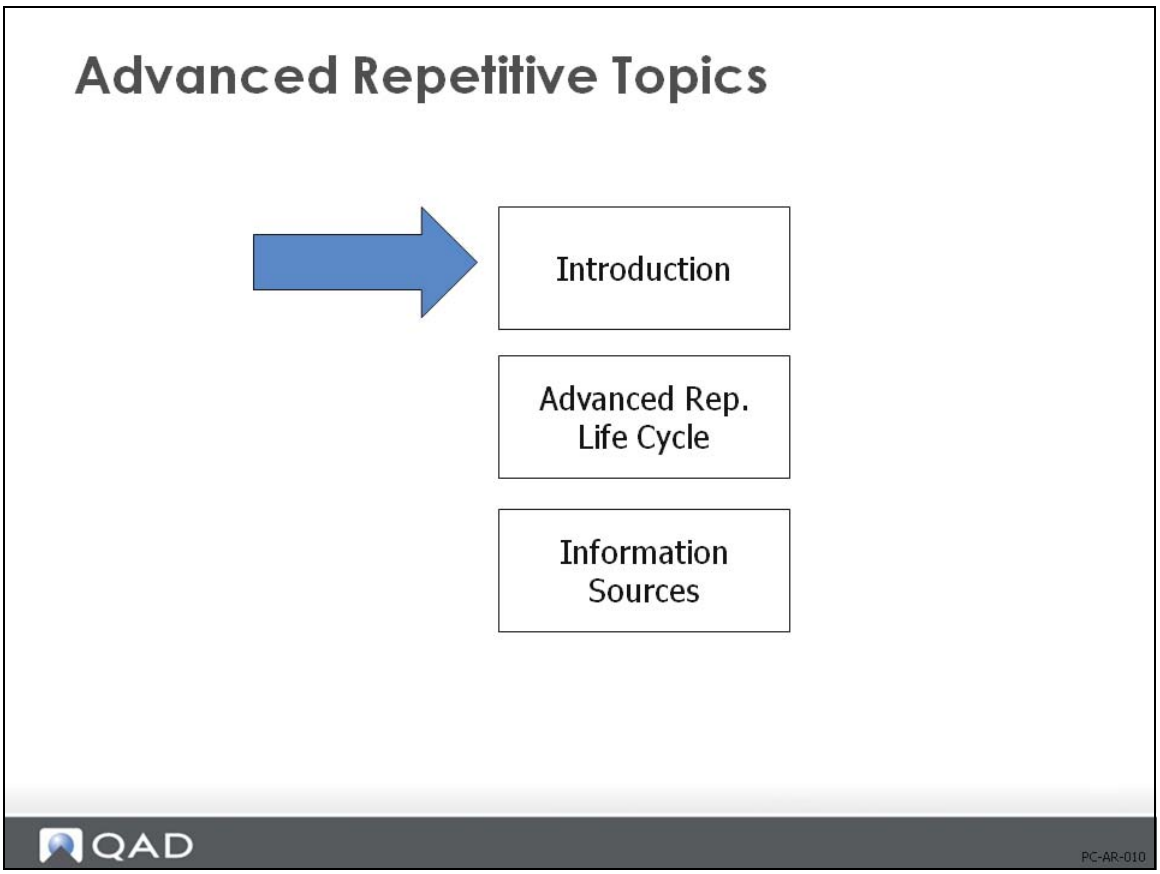
QAD Support

Support also offers an array of tools depending on your company’s maintenance agreement with QAD. These include the Knowledgebase and QAD Forums, where you can post questions and search for topics of interest. To access these, choose Visit Online Support Center under the Support tab.

Chapter 1

Advanced Repetitive Costing

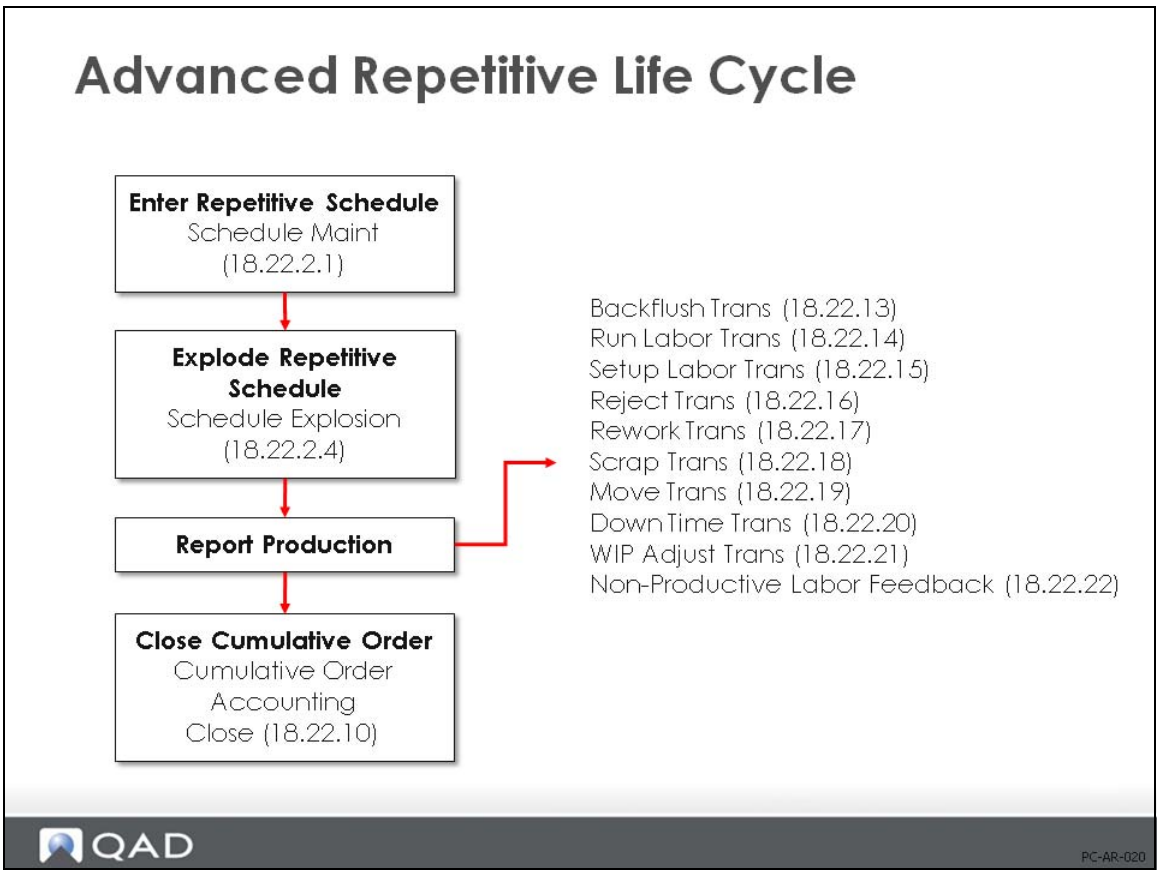
Advanced Repetitive Topics



The introductory section of this chapter on advanced repetitive transactions and costing includes a comparison of advanced repetitive and work orders, and a discussion of two key concepts; the cumulative order and milestone operations. The rest of the chapter covers the advanced repetitive life cycle: labor reporting, posting accumulated usage variances, scrap, and closing the cumulative order.

A good working knowledge of Advanced Repetitive functionality as taught in the Advanced Repetitive course will be helpful. This course, focusing on cost, does not cover all the functionality of Advanced Repetitive and takes several shortcuts that would not be normal in a production scheduling environment.

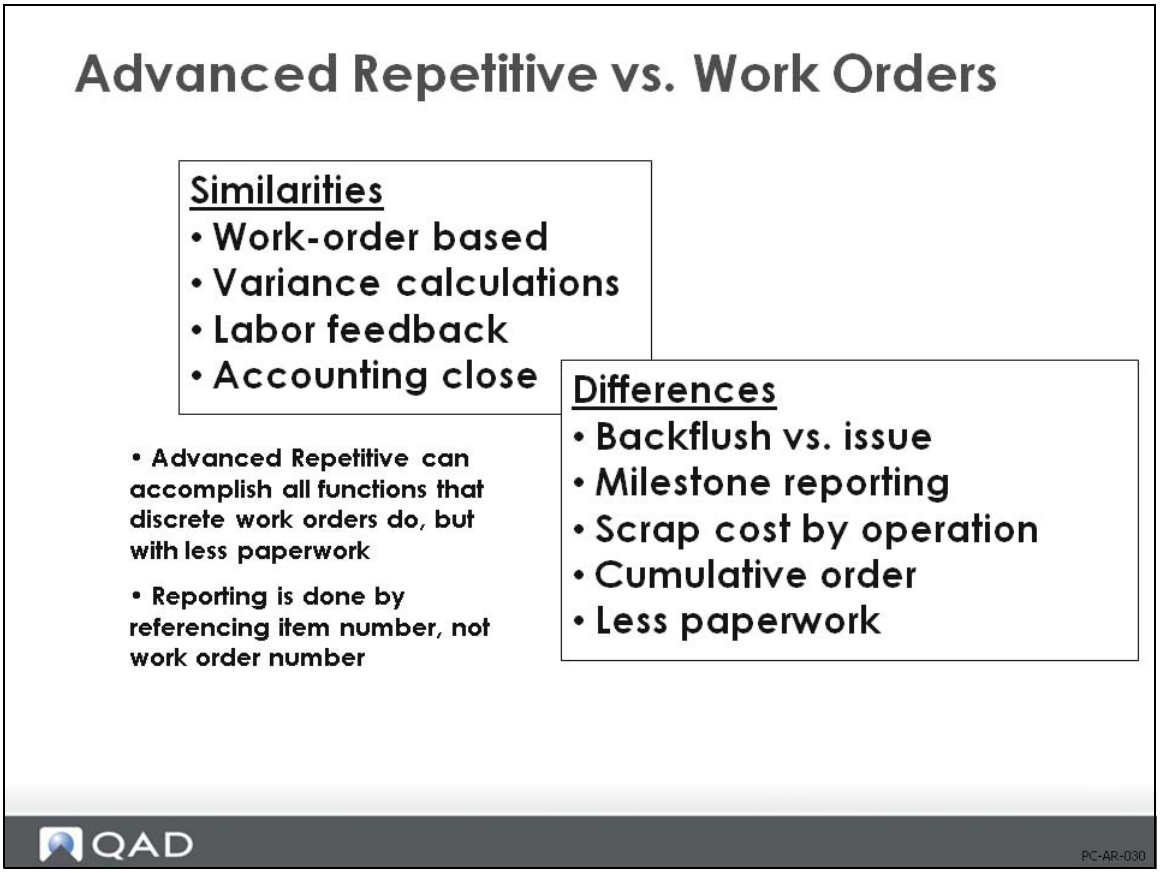
Advanced Repetitive Life Cycle



QAD Enterprise Applications offers several methods of managing manufacturing activities: work orders, Kanban, Flow, and Line Sequence Repetitive. Primarily, the choice between these has to do with the level of detail required when controlling each part of an operation. The Work Orders module manages work by tracking each individual operation and component item issued to make an item or group of items. Detailed reporting is the norm.

The Advanced Repetitive module, on the other hand, manages work using production schedules. It assumes if the schedule was met, then a certain number of operations have been completed and a certain number of components have been used. Only exceptions are reported. From a cost point of view, most costs are simply reported at standard. Actual run and setup times can be reported in various transactions and can generate variances.

Comparison of Advanced Repetitive to Work Orders



Because the cost impact of the Advanced Repetitive function is usually the same as a counterpart in Work Orders, we will point out similarities and focus on differences.

Similarities

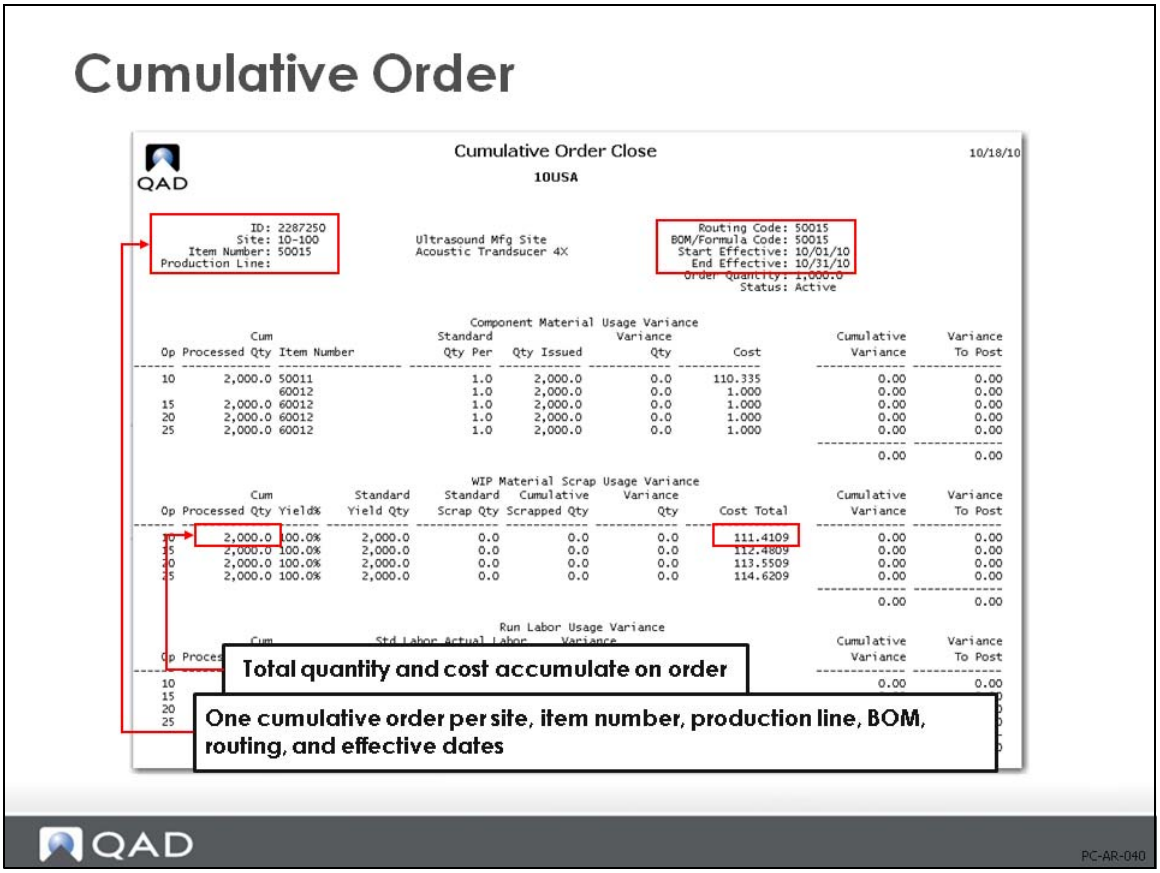
- Both Advanced Repetitive and Work Order functions start with a work order (in Advanced Repetitive it is system generated and transparent to the user). It has the same information as a standard work order: item, site, quantity, BOM, and routing. Attached is an exploded BOM and routing with frozen standards for calculating cost variances, as in Work Orders.
- Actual labor is entered, burden absorbed, completions reported, and overhead applied. An accounting close function reports floor stock, calculates variances, and reconciles WIP balances.

Differences

- With no separate issue or receipt functions, receipts are processed as labor is reported. Components are issued at that time and backflushed at standard cost-issued from inventory based on number of items received and standard quantity per.
- Advanced Repetitive functions require less detailed reporting. Reporting is done only at selected milestone operations. The others are backflushed at standard. Scrap can, however, be reported and accurately accounted for at any operation.

- Reporting is done by item, rather than work order, and costs are accumulated on a “cumulative order.” Costs are accumulated over a period of time, usually by accounting period.
- With work orders, both costs and operation run times come from the routing for an item. Repetitive schedules are based on units per hour run times set up in Production Line Maintenance either by production line or by item. Each production line can have a default rate that in effect says any item made on this line runs at this rate. Or rates can be set up by item. So the number of units that can be produced is set by the line rate, but the cost is still based on the times set in the routing. A good way to ensure that costs reflect run times is to use Routing Maintenance Rate Based (14.13.2) and set the units per hour in the routing to the same value set in the production line record. If the route record has setup time, it should be the same as the changeover time in the production line record.

Cumulative Orders



Total quantity and cost are accumulated on a cumulative order.

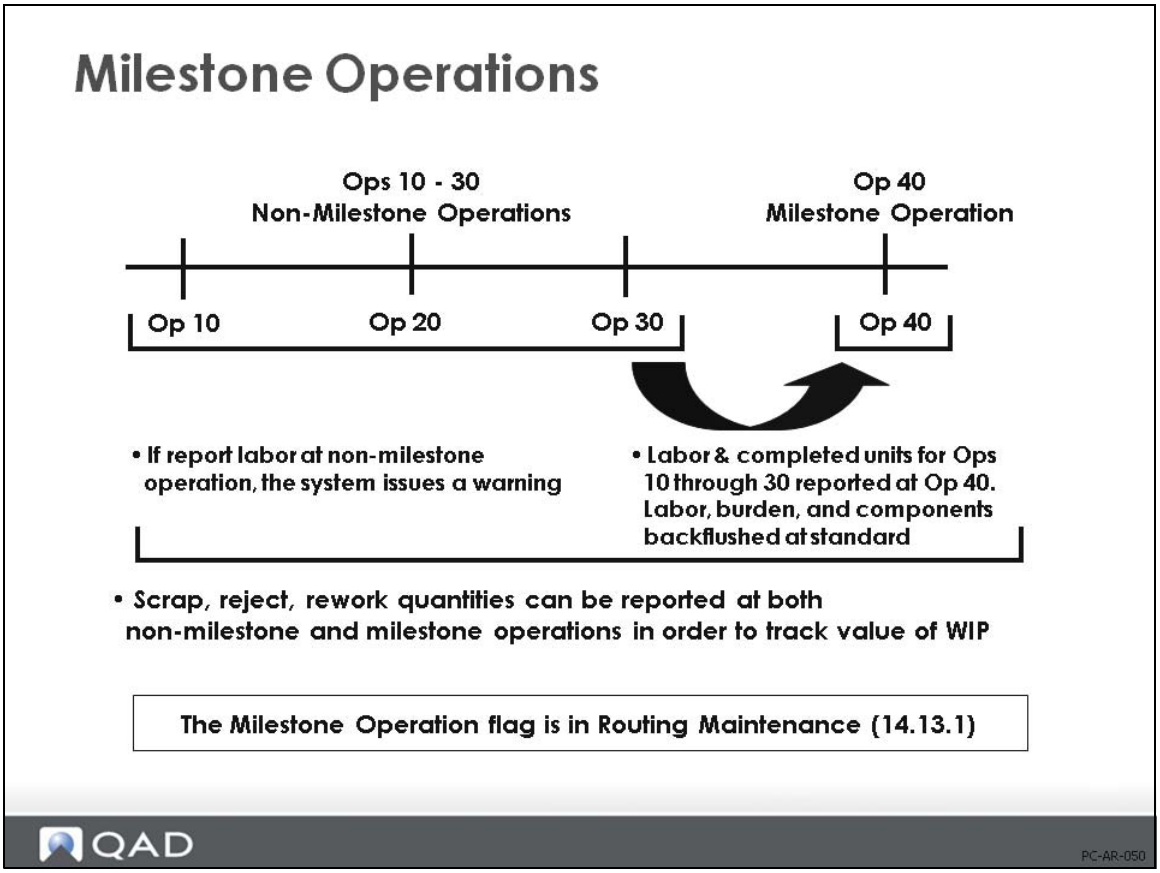
- In the example above, a quantity of 500 units are completed per day for five days; therefore the cumulative order shows 2,500 units processed

There is one cumulative order per site, item number, production line, BOM, routing, and effective dates. For example, two production lines running the same item in parallel will each have a separate cumulative order. A family of three similar items running on the same production line will each have its own cumulative order.

Advanced Repetitive functions are normally used in high-volume manufacturing environments, where you don’t need detailed costs for each individual production order. Instead you need to know the costs over a period of time. This period can be as short as a single production run, but normally is much longer (many companies accumulate and report costs in aggregate by GL period). To allow for this, Advanced Repetitive functions accumulate costs on a special type of work order—a Cumulative Order—one for each item, site, and production line. These are created automatically when you first report labor for an item, site, and production line.

When the Cumulative Order is created, this initiates a cost roll-up that generates a set of independent rolled up cumulative order costs using the BOM, routing, work center, and material rates effective at the start effective date of the order

Milestone Operations



The Milestone Operation field is in Routing Maintenance (14.13.1) or (14.13.2).

Another difference between Advanced Repetitive and Shop Floor labor reporting is in the use of milestone operations. In Shop Floor Control, when you report labor at an operation, you can specify “complete previous operations.” This automatically closes all previous operations and reports labor at standard (for any unreported operations).

Advanced Repetitive has similar, but much more sophisticated, functionality. You can set up certain operations as milestone operations and labor reporting is done at these operations. When a milestone operation is reported, that operation and all previous non-milestone operations are backflushed as long as a valid operation number is entered in the Op field in Product Structure Maintenance (13.5); otherwise no backflushing of components will take place. Labor is automatically reported at standard for those operations and any components associated with those operations are issued.

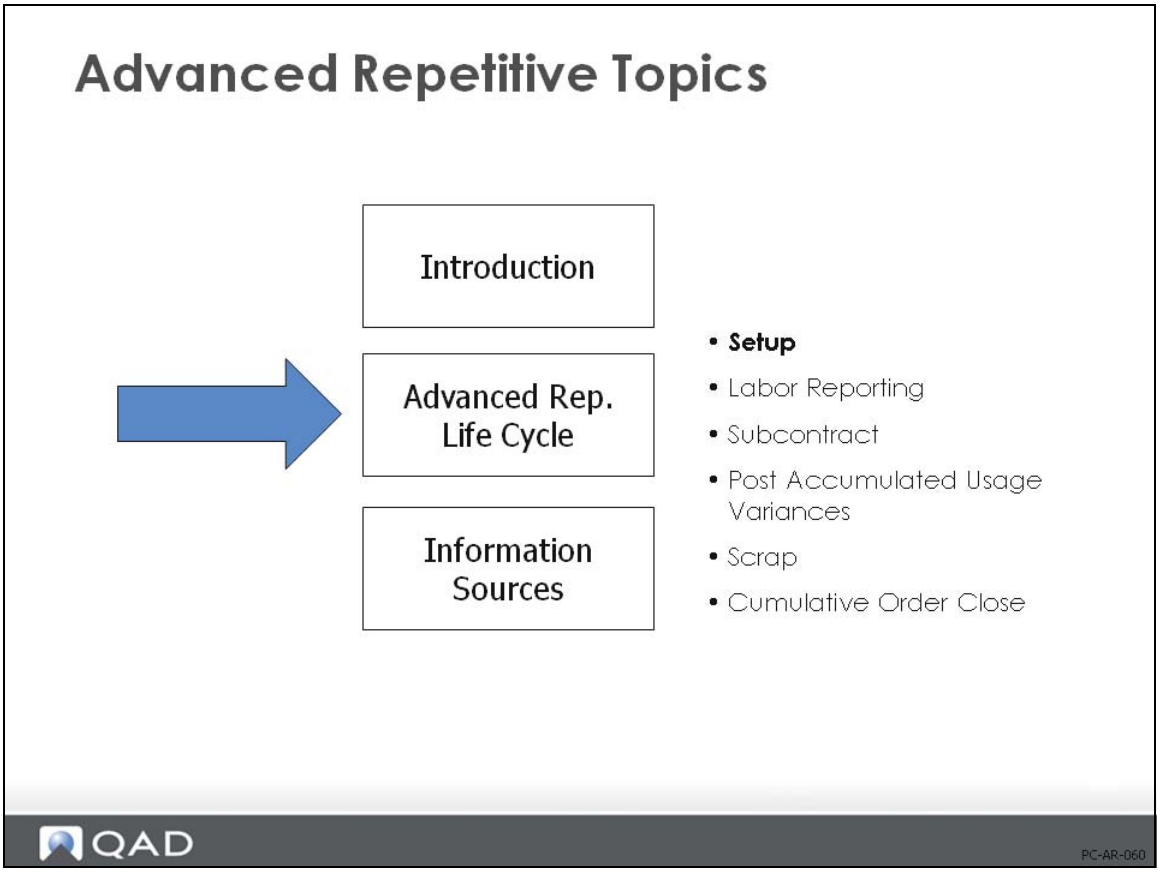
Certain rules govern milestone reporting:

- You can report setup, down time, reject, and scrap against milestone or non-milestone operations. In this case, you create WIP balances at non-milestones. This allows for more accurate tracking of WIP costs and quantities.
- Although the system lets you report labor against a non-milestone operation, a warning is issued.
- If you report scrap or rejects at non-milestones operations, it will backflush components associated with that operation.

- If WIP Lot Trace is enabled addition rules for reporting operations are invoked.Refer to WIP Lot Trace documentation for details.

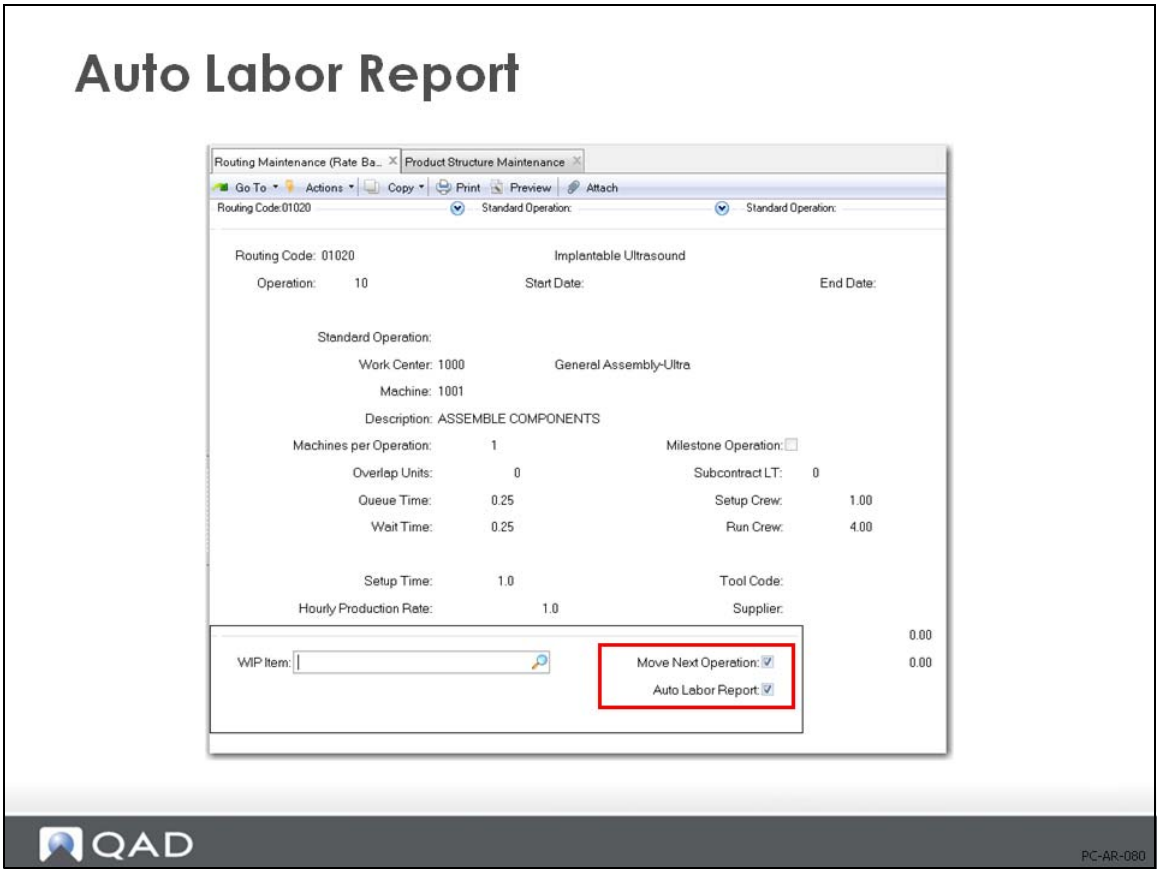
To report all operations at standard, set up a final “receiving” operation as the only milestone operation. The last operation is always considered a milestone.

Setup



There are a few key screens and fields that need to be set up prior to using the advanced repetitive functionality. They are Advanced Repetitive Control (18.22.24), which enables advanced repetitive, the Auto Labor Report field in Routing Maintenance (14.13.1), Routing Maintenance (Rate Based) (14.13.2), and the Op field in Product Structure Maintenance (13.5). These are discussed on the following pages.

Repetitive Control Program Screen



Advanced Repetitive Control (18.22.24)

Next Picklist: The number you want the next picklist issued to be.

Picklist Prefix: A code to put in front of the picklist

Enable New Repetitive. To enable Advanced Repetitive, set this field to Yes

Transfer WIP . Values are Yes or No. This becomes the default for the field of the same name in Cumulative Order Close (18.22.10). See Closing the Cumulative Order.

Note The WIP Transfer Account is in Advanced Repetitive Accounting Control (36.9.12).

WIP Transfer Account. The GL account debited or credited when closing a cumulative order and transferring WIP to a new cumulative order.

End Eff Default Method. Set to the method you normally use to end effectivity dates on cumulative orders. You have four options:

- Blank: Start and end effective dates are not set
- 1: Start and end effective dates match the dates of the GL period in effect during the transaction
- 2: Start and end effective dates match the calendar start and end effective dates of the month of the transaction
    - 3: Start and end effective dates cover a number of days, so the transaction effective date falls in that interval

End Eff Days. Value is zero or greater. Use if the End Eff Default Method is set to method 3. Shows the number of days that the start and end effective dates cover.

Include Yield. Set this to Yes to have the system include the yield percent established in Routing Maintenance (14.13.1) in the cumulative order cost.

Zero Balance WIP. The system uses Zero Balance WIP logic or Pulling WIP logic based on the setting in this field. The default setting is Yes, and the following functions are affected by this field: Backflush Transaction (18.22.13), Rework Transaction (18.22.17), Sub Shipper Issue (18.22.5.11), and PO Shipper Receipt (5.5.5.5).

- If Zero Balance WIP is Yes, then the system considers the quantity processed at the current milestone/non-milestone operation to be the quantity processed through all prior non-milestone operations up to the current operation.
- If Zero Balance WIP is No, then the system uses a Pulling WIP logic.

  When the quantity processed at any milestone or non-milestone operation is more than the quantity processed at earlier non-milestone operations, WIP quantity in the input queue of the current operation and input/output queues of prior non-milestone operations are pulled appropriately. Components are backflushed at earlier non-milestone operations in order to balance the component quantity backflushed at the current operation.

  When the quantity processed at any operation is the same or less than the quantity processed at prior non-milestone operations, only the input queue of the current operation is relieved

Reason Code Criticality. Specify the system response when an invalid reason code is entered while recording repetitive backflush transactions.

W (Warning): The system displays a warning message and pauses; the system accepts the value when you press any key. This is the default value.

C (Critical): The system displays an error message and prompts you to continue. If you choose No, the system returns to the Reason field so you can modify it. If you choose Yes, the system accepts the value.

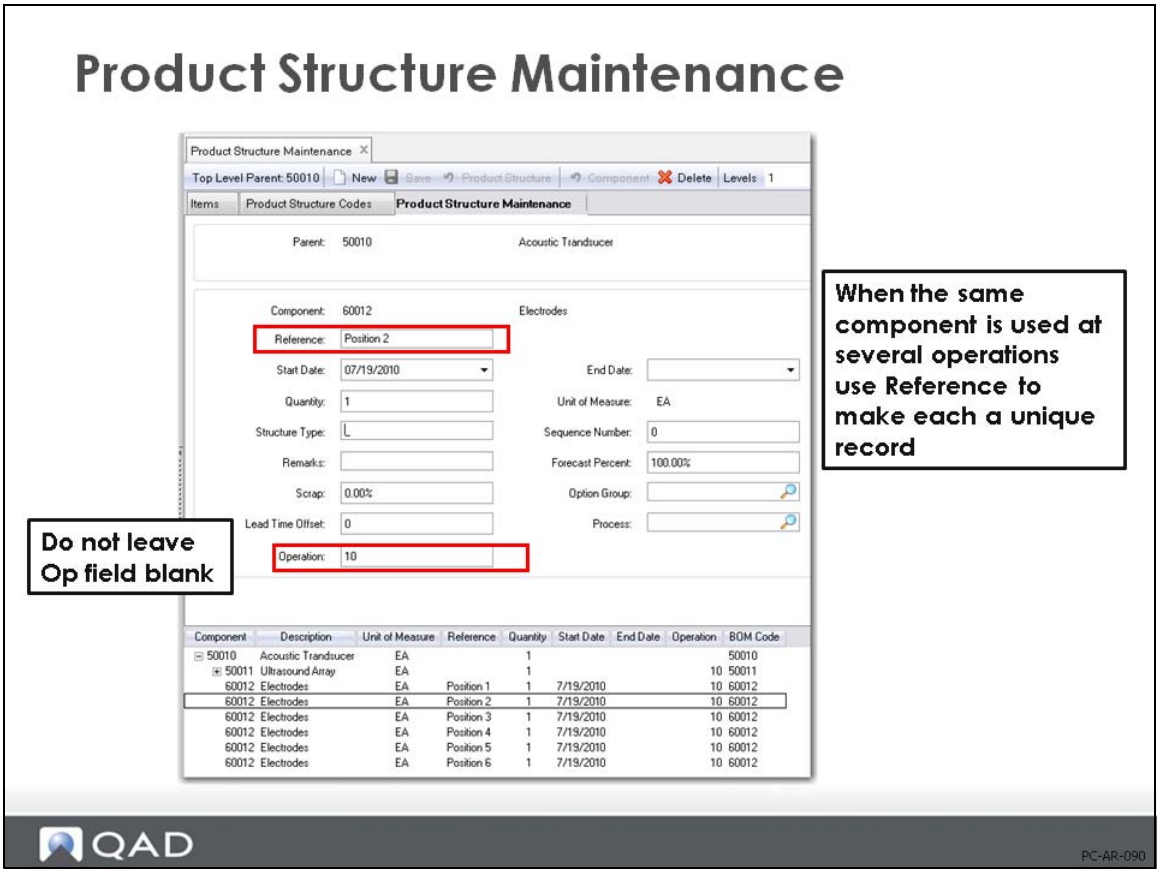
Allow Zero Run Rate. Specify whether item-level records defined in Production Line Maintenance can include a 0 (zero) value in the Units/Hour field.

No (default): The item Units/Hour defaults from the production-line run rate. The system always uses the item run rate when calculating schedules for the item. Although you can change the default, you cannot set it to 0.

Yes: The item Units/Hour defaults to 0. Unless you change it, the system uses the production line run rate when scheduling the item. Otherwise, it uses the specified non-zero item-level value.

Set the field to Yes to define a global run rate for all items on each production line. In Production Line Maintenance, you can then specify a Units/Hour value at the production-line level and leave all or most item-level fields set to 0. If individual items are exceptions, you can define item-specific run rates just for them.

Auto Labor Report Field



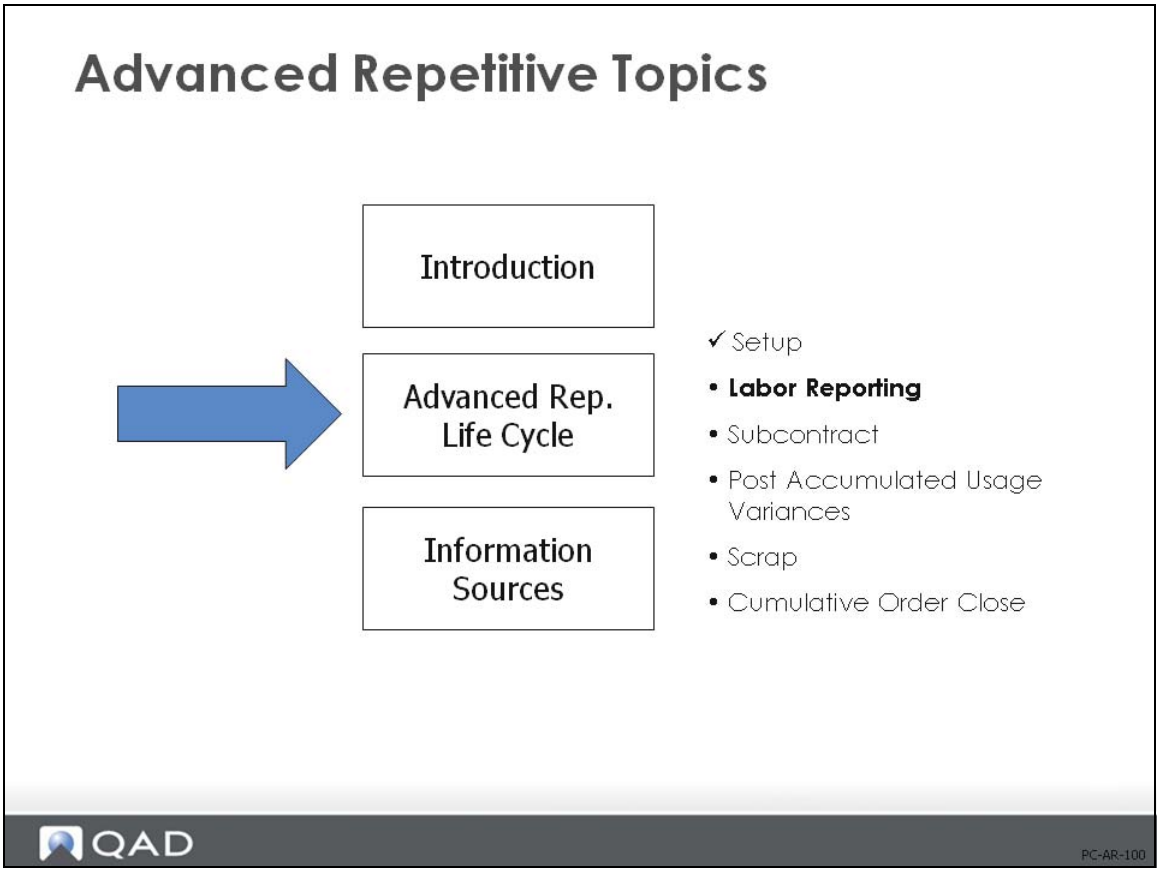
The Auto Labor Report field is in Routing Maintenance (14.13.1) (and 14.13.2).

- For non-milestone operations, set the Auto Labor Field to Yes. This will automatically close the labor out at the standard value when the work order is closed. Labor reporting is not required.
- For milestone operations, if actual labor times are being reported, the field should be set to No. This indicates that the labor reported at that operation is the actual labor and will only be compared to the standard.

  If a milestone operation has the field set to Yes, any labor reported will be added to the standard labor on that operation

Note Setup is never part of automatically reported costs in Advanced Repetitive. This means that to record setup time at an operation, you must enter it manually using Setup Labor Transaction (18.22.15). The Auto Labor Report field does not affect setup. If there are change over times in the repetitive schedule records for an item, and you track costs, you should report this time as setup labor.

Labor Reporting



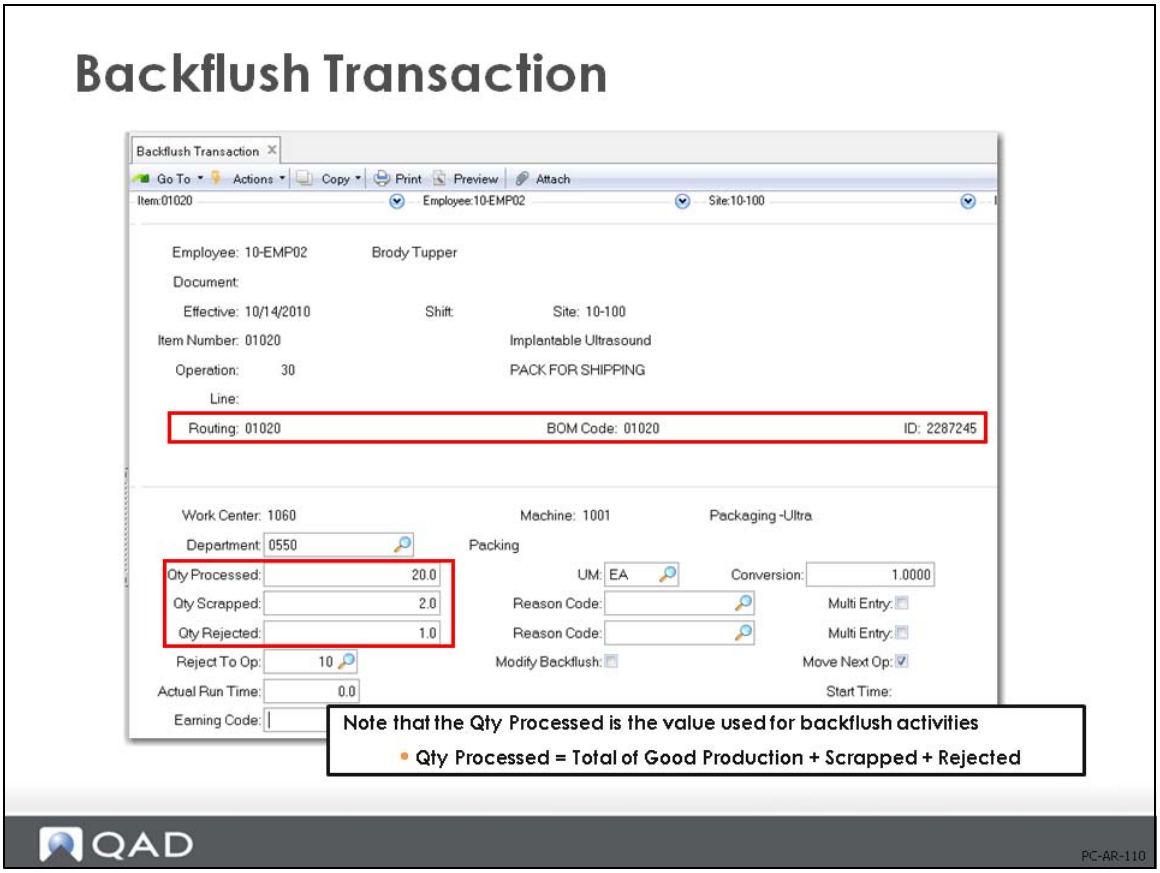
When using Advanced Repetitive (or Repetitive), it is important that an operation be entered in the Op field in Product Structure Maintenance (13.5).

Op. The routing or process operation at which this component is used.

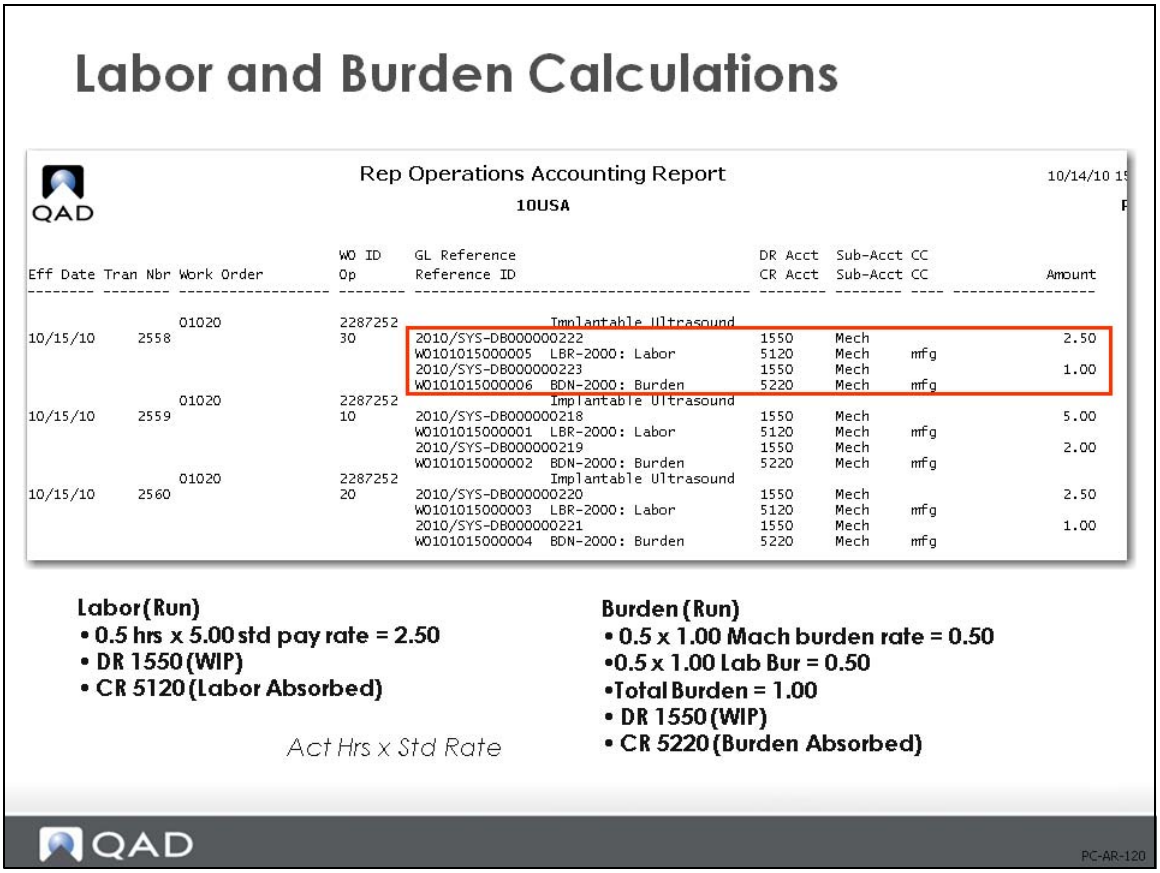
Determines whether this component is backflushed. If you enter the operation number here, this component is automatically issued (backflushed) when you report quantities for the parent in Advanced Repetitive or Repetitive labor and scrap reporting transactions. If Op is [blank], or does not match a defined operation, this component is not backflushed.

Use the reference field to accommodate the same component issued at multiple operations. For example if you have a common component that is issued at operations 10, 20, and 30, you could assign a reference code of 10, 20 and 30 to each component at each operation. For costing by operation it is important to know which components are issued at which operations.

Backflush Transaction



Labor and Burden Calculations



Backflush Transaction (18.22.13) is one of the most important Advanced Repetitive functions. From a cost perspective, it is used to report labor hours and operation completions, backflush materials associated with the operation from inventory based on the quantity completed (the quantity can be changed manually), and to put finished items into stock when completions are reported at the last operation).

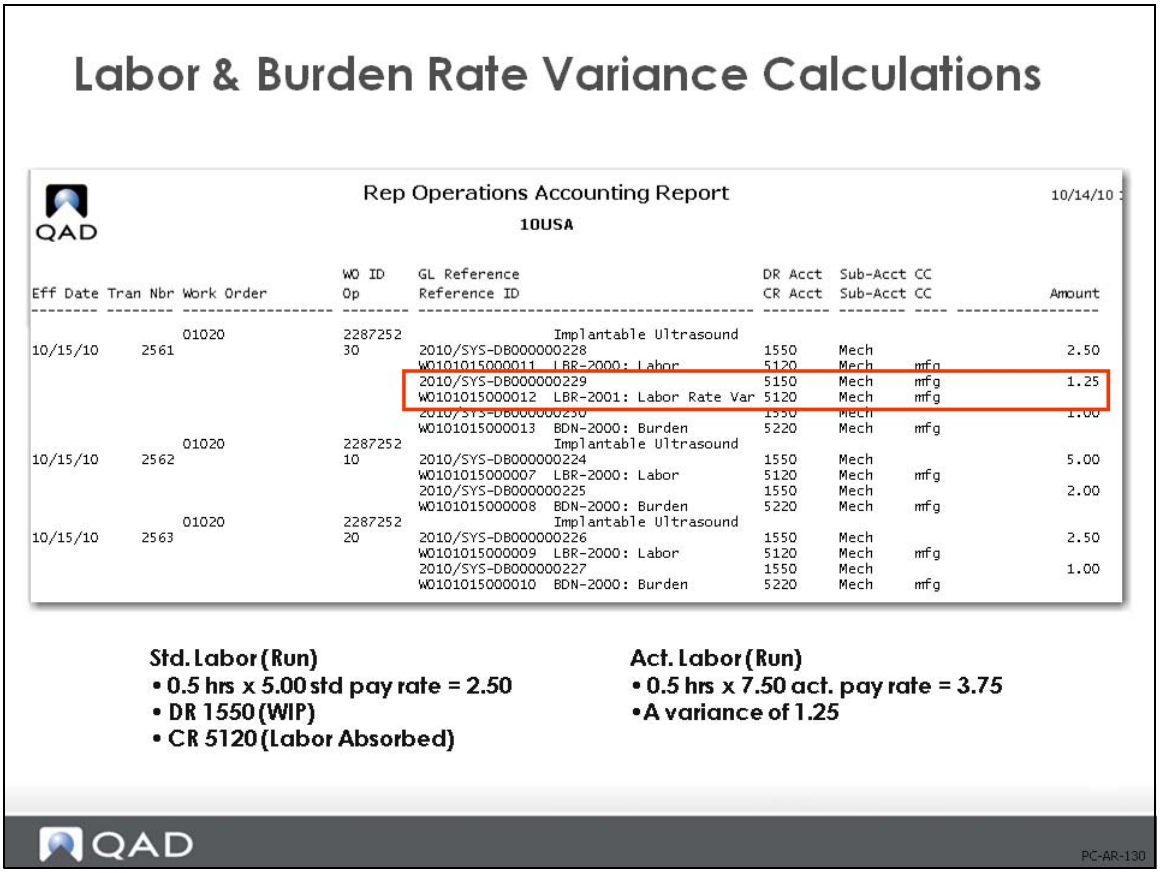
This transaction also completes and reports previous non-milestone operations.

You can also report scrap and rejected quantities. Note that the quantity processed is the total units processed. In the example shown 20, units were processed of which 2 were scrapped an 1 rejected back to operation 10. At this time there are only 17 good units at operation 30 that will be closed to inventory.

The ID number shown is the ID of the cumulative order to which the costs will be booked.

If an alternate BOM and or routing are to be used, they must be specified on the Backflush Transaction (18.22.13) screen. This will generate a new cumulative order that is then used to determine manufacturing performance and variances. Differences between the rolled up cumulative order cost and the GL standard cost are reported as Method variance.

Repetitive Labor and Burden Calculations



In Advanced Repetitive, each type of labor—setup, run, rework, down time, and non-productive time—is reported using a different transaction. This is a bit different from Shop Floor Control (16.20.24) where there was only one transaction to record setup, run, rework, and down time, and another to record non-productive time. But from a GL and cost perspective, this difference is superficial. The effect is the same.

- Actual costs and automatically reported labor costs are entered in the WIP (debit) and the Labor and Burden Absorption accounts (credit) (see figure above). Auto Reported Labor should not generate any variances. If you report labor at an operation flagged for Auto Labor, the reported hours will be added to the automatic hours and will generate a variance.
- Any differences between actual and standard costs generate variances for labor and burden rate, which appear immediately. Labor and burden usage variances are generated by Post Accumulated Usage Variances (18.22.9) or Cumulative Order Close (18.22.10)

Note GL transactions created by Advanced Repetitive labor reporting have a GL type of WO. The description is BCKFLSH trans#, where trans# is the transaction number of the operation history, and can be viewed by using Operations Transaction Detail Inquiry (18.22.4.2).

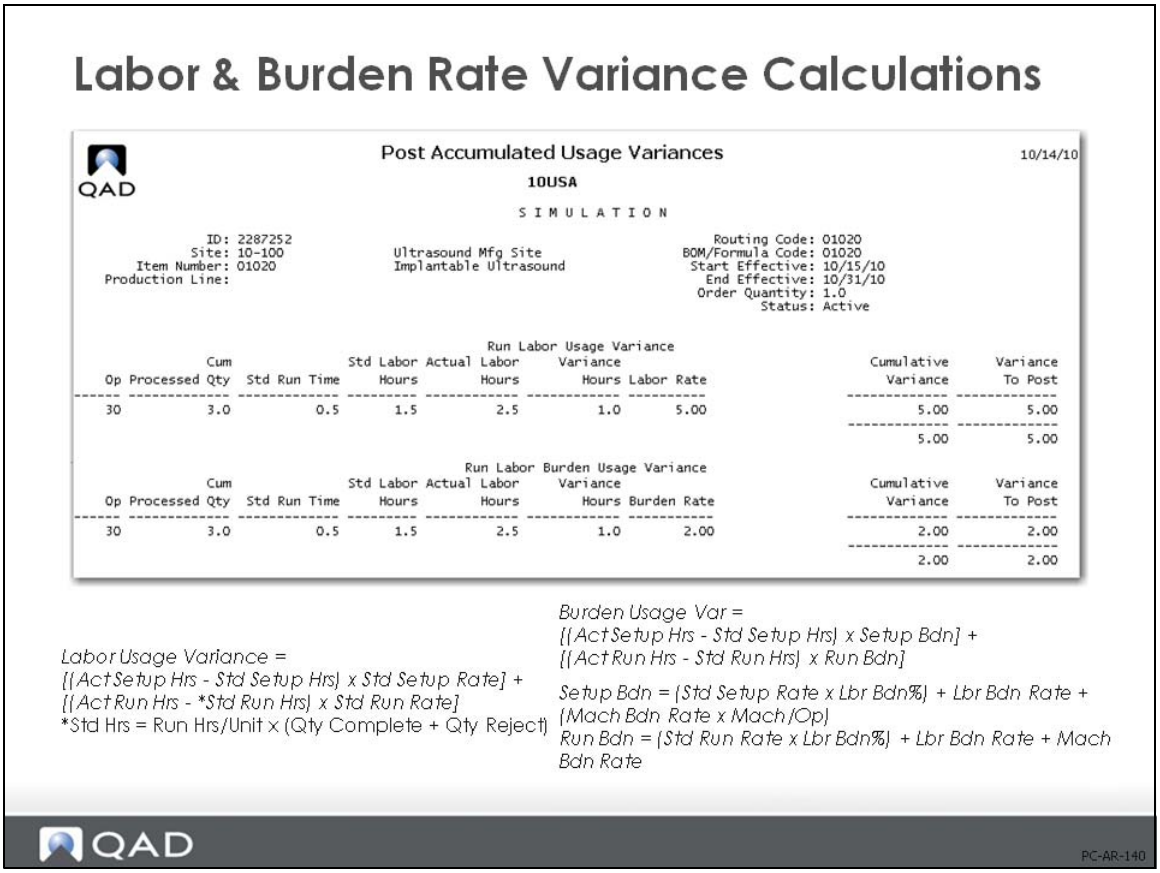
The calculations for labor and burden are the same as for work orders and can be found in the appendix at the end.

Non-Productive Labor

Non-Productive Labor includes any time not spent in production (for example, preventative maintenance, meetings). These costs are not considered part of WIP and they don’t contribute to manufacturing variances. Down time and non-productive labor cost are reported directly to the Cost of Production account (debit) and to the Labor Absorption account (credit). An operation history record of type DOWN is generated.

Note Operation transaction history provides the basis for many history reports within QAD Enterprise Applications, efficiency, utilization, and downtime for example.

Labor and Burden Rate Variance Calculations



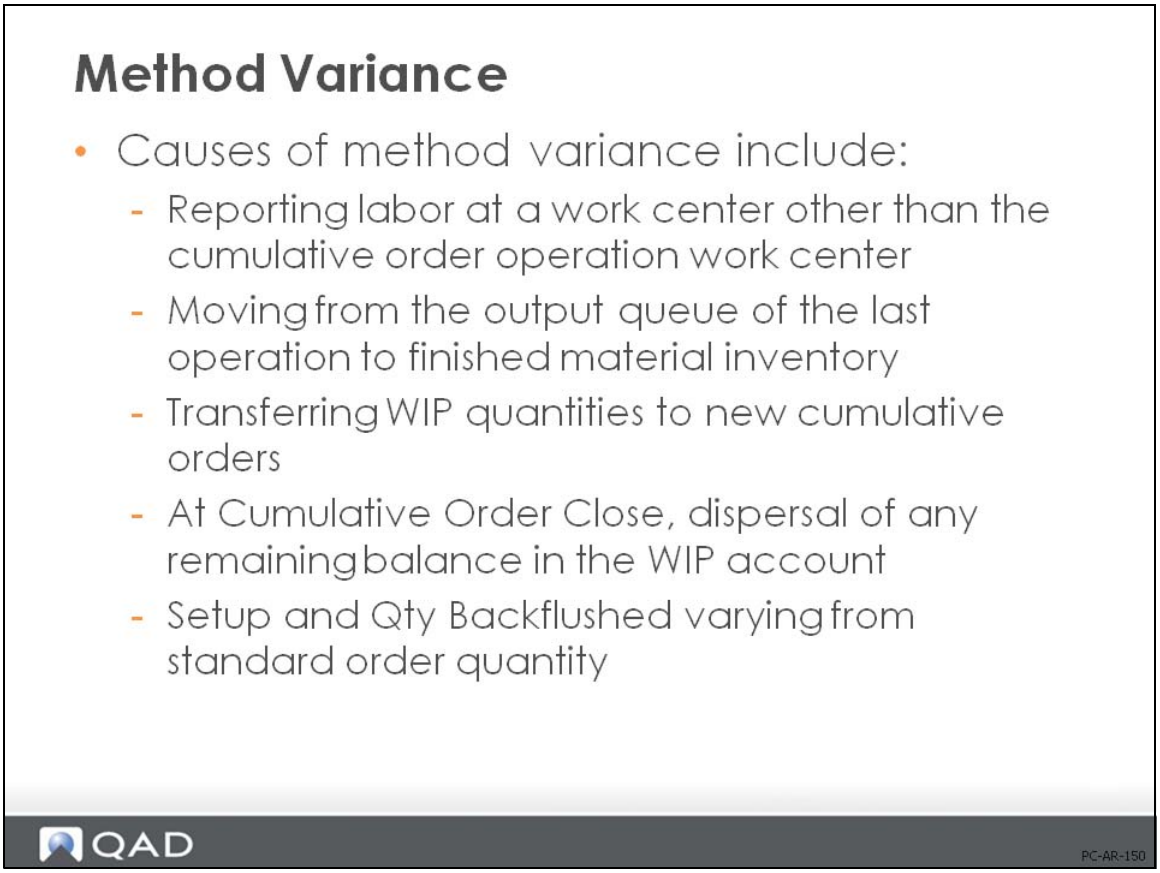
All transactions consuming resources are immediately calculated and their rate variances are recorded.

- For component material, rate variance is calculated as the difference between the GL cost presently in effect and the GL cost captured in the cumulative order. Usually there is no component material rate variance. It occurs if the GL standard cost of the component material changes during the lifetime of the cumulative order.
- Labor and burden rate variance is calculated in a similar way. When a cumulative order is created, standard labor and burden rates are captured from the routing and work center data in effect. When labor is reported at a cumulative order operation work center, rate variance is calculated as the difference between the actual employee pay rate and the captured labor rate standard. This assumes actual employee pay rates are maintained using, Actual Pay Rate Maintenance (14.13.21). In the example shown the employee pay rate is 7.50 not the 5.00 work center standard. This caused the labor rate variance.
- Subcontract rate variance is the difference between the purchase order price per unit and the subcontract cost per unit as captured in the cumulative order.

  This is recorded in two stages by the Cost of Production account using the RCT-PO from Purchase Order Receipts (5.13.1) and an operation history record, type SUBCNT.

The calculations for these variances are the same as for work orders and can be found in Appendix A, “Variances and Components Reference,” on page 73.

Labor and Burden Usage Variance Calculations



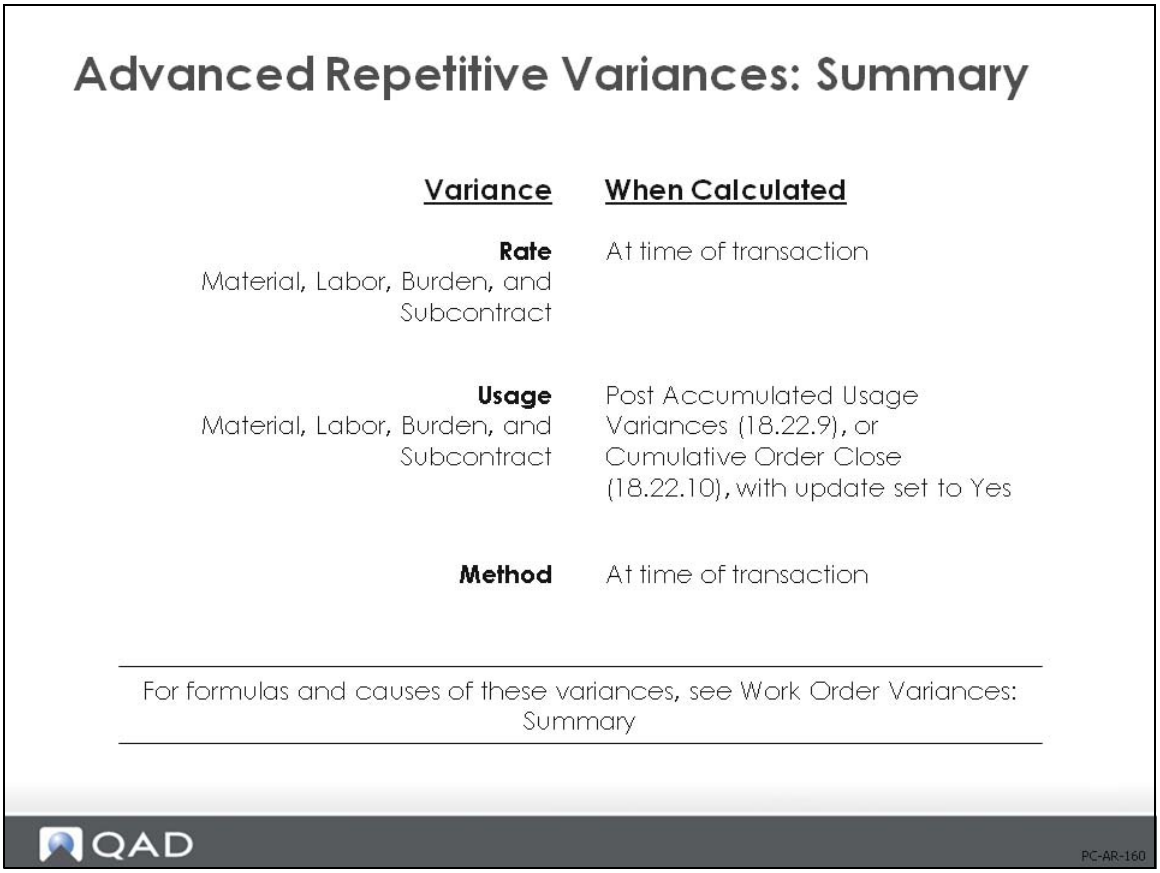
Labor and burden usage variances are generated when there is a difference between the actual hours needed to complete an operation and the standard hours.

In the example shown here the standard at operation 30 is 0.5 hours, and the operation is flagged for automatic labor reporting. An additional 1.0 hours run time was reported during the backflush transaction. This generated the 5.00 labor usage variance (5.00 is the standard work center rate). It also generated the 2.00 burden usage variance as both the machine burden rate and labor burden rate are 1.00 per hour.

Usage variances are calculated and recorded upon Post Accumulated Usage Variances (18.22.9) or Cumulative Order Close (18.22.10)

The calculations for these variances are the same as for work orders and can be found in the appendix at the end.

Method Variance



Method variance is calculated and recorded upon the following transactions:

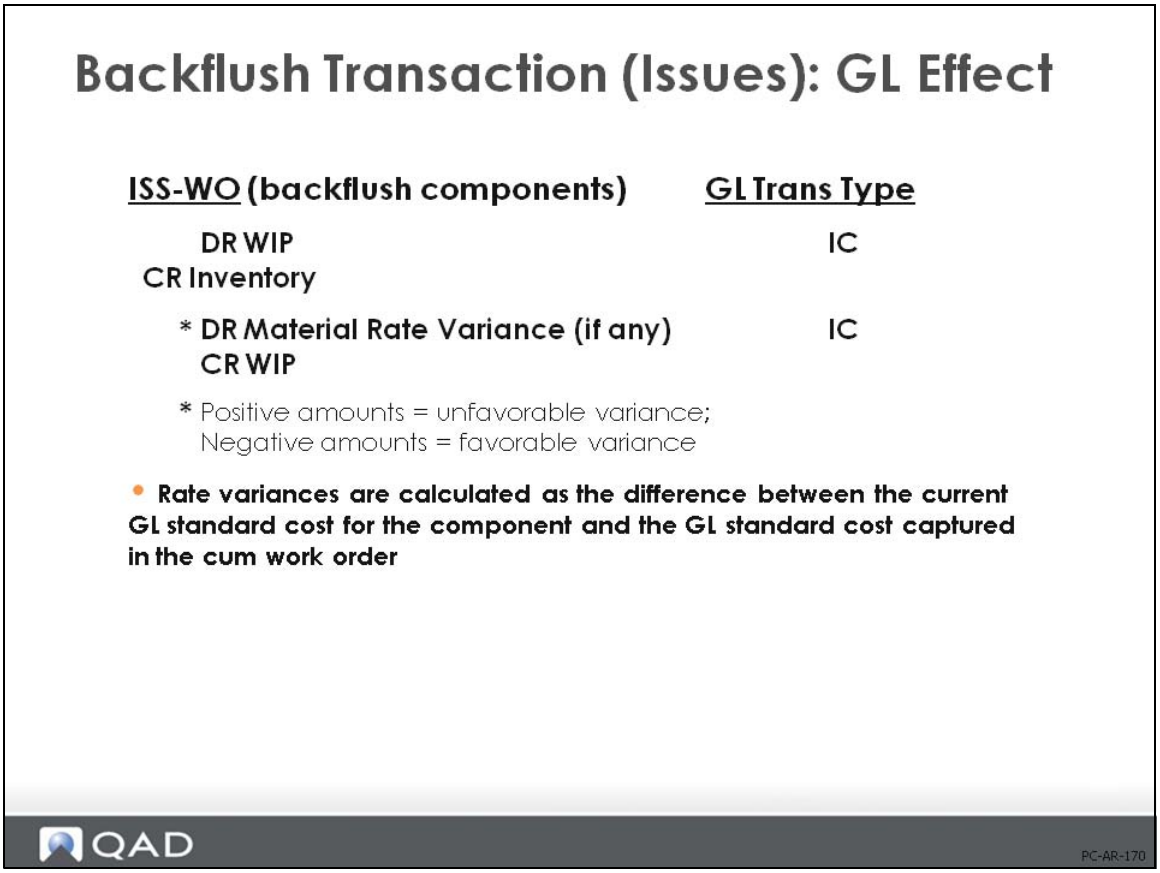
- Cumulative Order Close (18.22.10)
- Backflush Transaction (18.22.13)
- Labor Transaction (18.22.14)
- Setup Labor Transaction (18.22.15)
- Rework Transaction (18.22.17)
- Move Transaction (18.22.19)

Causes of Method Variance

- When labor is reported in the transactions listed, method variance can be generated when reporting at a work center other than the cumulative order operation work center. Method variance is calculated as the difference between the standard labor and burden rates of the work center being reported and the standard labor and burden rates of the cumulative order operation center, extended by the number of hours reported. This prevents charging unexpected rate variances to work centers.
- Understand the relationship between your work centers and your production lines. Costs are calculated from data in the work center record and the route. Scheduled run times in repetitive scheduling are based on production line rates. You could set up one production line per work center or one work center with all similar production lines.

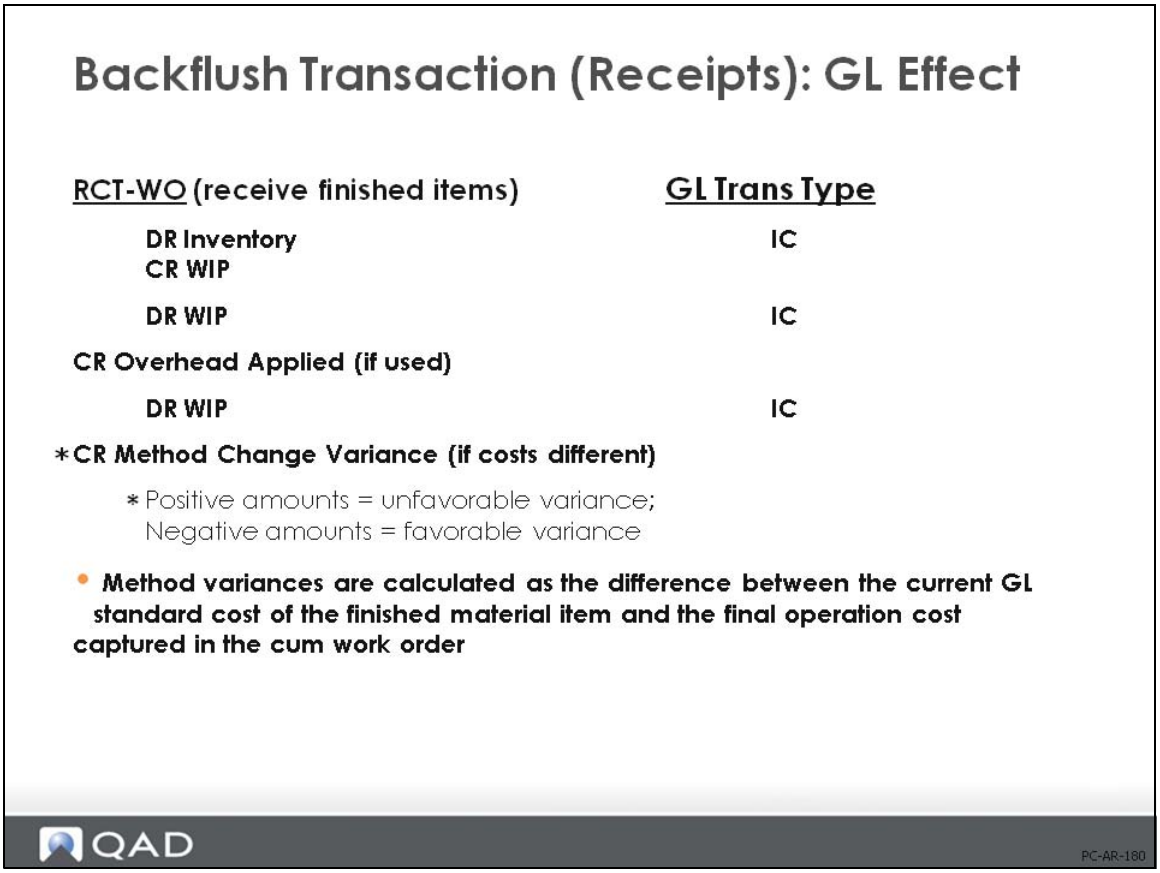
- In the Backflush transaction and Move transaction, method variance can be generated when moving from the output queue of the last operation to finished material inventory. Method variance is calculated as the difference between the final operation cost contained in the cumulative order and the current GL standard cost of the finished material, extended by the quantity being reported.
- In Cumulative Order Close, method variance can be generated when transferring WIP quantities to new cumulative orders. Method variance is calculated as the difference between the operation cost in the former cumulative order operation and the operation close of the future cumulative order operation, extended by the quantity transferred.
- Rounding of costs held in several decimal places could result in a non-zero balance in the WIP account. This is changed to a Method variance at Cumulative Order Close.

Advanced Repetitive Variances: Summary



- Material, labor, burden and subcontract rate variances are generated at the time of the transaction
- Material, labor, burden and subcontract usage variances are accumulated and are updated whenever either Post Accumulated Usage Variances (18.22.9) or Cumulative Order Close (18.22.10) is run with Update set to Yes
- Method variances are normally taken at the time of the transaction. When you use a work center that has labor and/or burden rates different than the those defined in the route, a method variance occurs. Alternative Routes can be set up if you routinely use alternative work centers/production lines. The alternative route does not prevent the method variance but rather explains the variance.
- GL scrap entries are not made until you run either Post Accumulated Usage Variances (18.22.9) or Cumulative Order Close (18.22.10)

Backflush Transaction (Issues) - GL Effect



The material transactions are the same as those created by the Work Order Component Issue (16.10) and Work Order Receipt (16.11) or Work Order Receipt Backflush (16.12) functions. In fact, the GL transaction type is the same (IC) and the inventory transaction type is ISS-WO (Work Order Issue) or RCT-WO (Work Order Receipt).

- For component issues, the standard quantity per (in Product Structure Maintenance (13.5)) is multiplied by the backflush quantity to determine the quantity to issue. Rejected quantities also backflush.

  By setting Modify Backflush to Yes, it is possible for you to backflush components using a different quantity than that specified by the BOM, change the backflush issue location, or backflush additional items

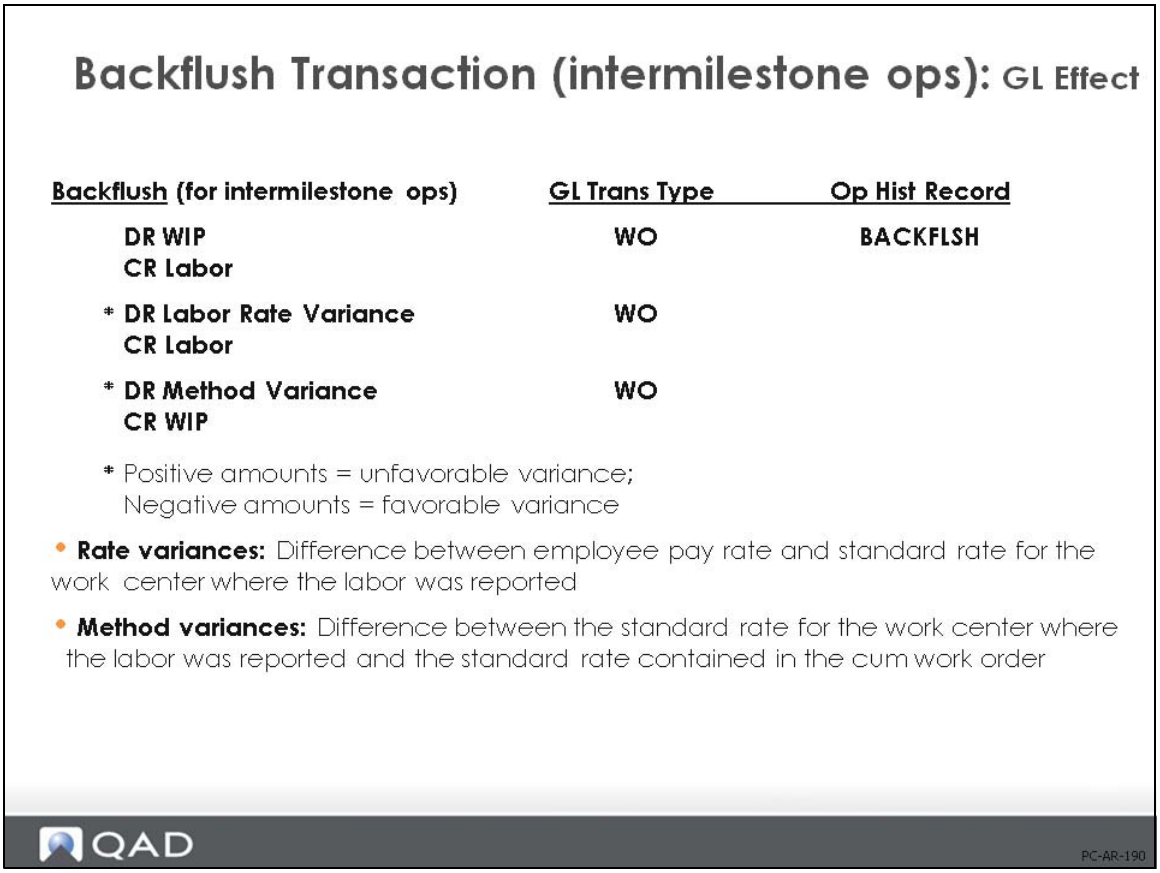
- The cumulative order frozen cost of the components issued is removed from Inventory (credit) and added to WIP (debit)

  If the cumulative order frozen cost is different than standard, a material rate variance is generated

  The frozen costs and rates captured on the cumulative order can be reviewed using the Cumulative Order Cost Report (18.22.4.10)

  Generally, components are issued from the same site, but if you manually override the backflush to issue from a different site, the appropriate intersite transfer will take place

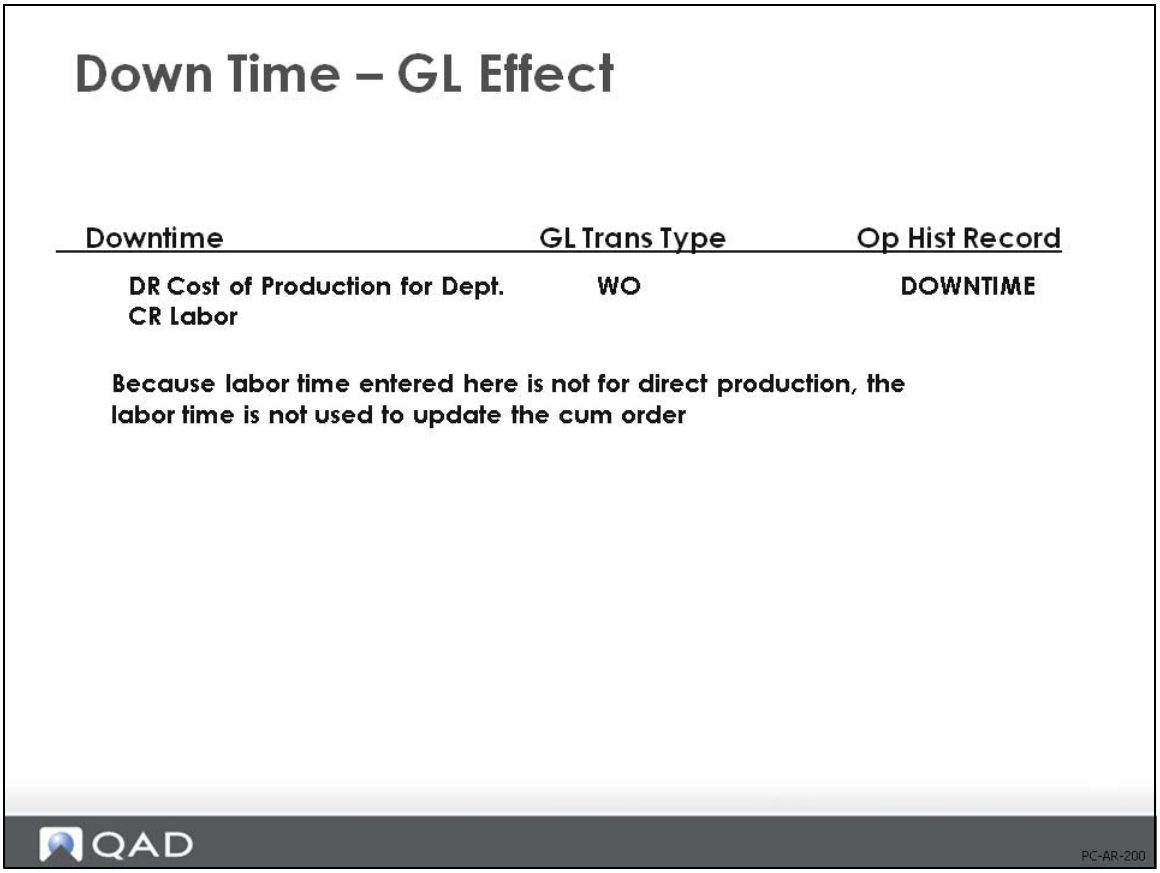
Backflush Transaction (Receipts) - GL Effect



Once the backflush is processed, you can enter the quantity to receive into stock. As with all receipts, this increases Inventory (debit), decreases WIP (credit), and applies any Overhead amount (credit).

- Method variances are calculated as the difference between the GL standard cost of the finished material item and the final operation cost captured in the cum work order
- The Rework Transaction (18.22.17) GL effects for work order issues and receipts are the same as those for the Backflush Transaction
- The Move Transaction (18.22.19) GL effects for receipt of finished goods are the same as those for the Backflush Transaction

Backflush Transaction (intermilestone ops) - GL Effect



For intermilestone operations, rate variances are calculated as the difference between employee pay rate and standard rate for the work center where the labor was reported.

Note When a backflush is initiated from a single “end of line” or “receive” operation, it is only possible to enter one employee number to cover all operations backflushed. To avoid rate variances where Auto Labor is set to Yes, ensure that no employee rate of pay is entered in Actual Pay Rate Maintenance (14.13.21).

Method variances are calculated for intermilestone operations as the difference between the standard rate for the work center where the labor was reported and the standard rate contained in the cum work order

Note The Labor Transaction (18.22.14), Setup Labor Transaction (18.22.15), and Rework Transaction (18.22.17) produce the same labor and burden GL effects as the Backflush Transaction.

Exercise 1: Setting Up Advanced Repetitive Costing

1 Review Advanced Repetitive Control (18.22.24). The Enable New Repetitive check box should already be checked. If not, check it. Set End Eff Default Method to 1.

2 Review Advanced Repetitive Accounting Control (36.9.12); the WIP Transfer account should be 1600 with a sub-account of Mech.

Exercise 2: Create New Repetitive Item

You will create a new Item, 50015, the Acoustic Transducer Quattro, by copying the 50010 and making some modifications.

1 Use Item Master Copy (1.4.12) to copy the 50010 to the 50015, change the description to Acoustic Transducer 4X. Accept all other defaults.

In the second frame delete the S in the Lot/Serial field, accept all other values.

Accept shipping data by clicking Next.

In planning data set the Order Quantity to 100.

Click Next through the cost frames.

2 Use Routing Copy (14.13.6) to copy the route of the 50010 to 50015, all operations.

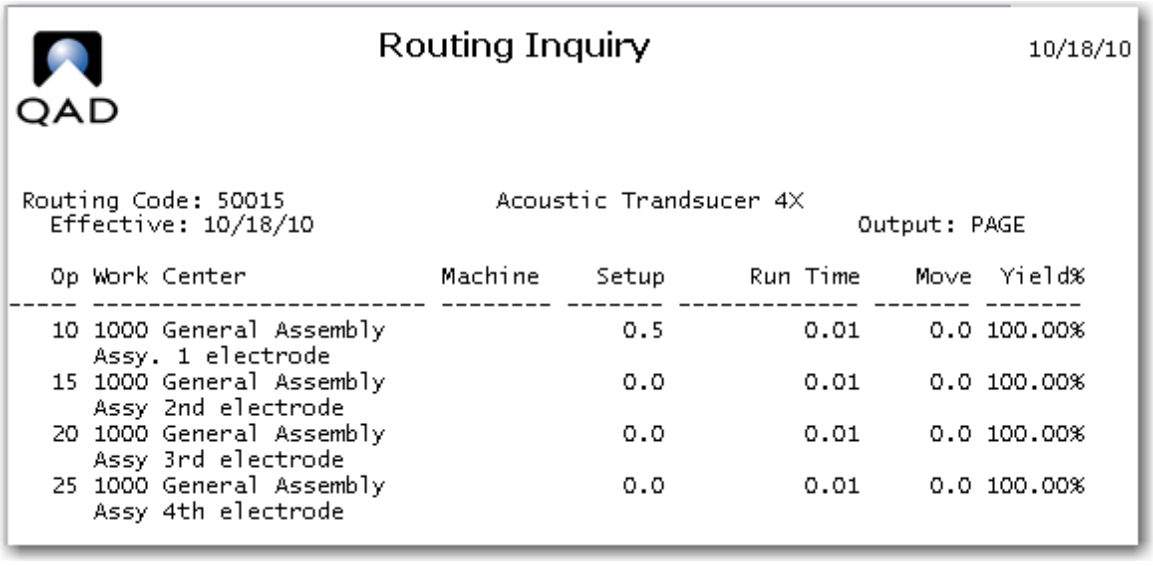
3 Use Routing Maintenance (Rate Based) (14.13.2) to modify the route of the 50015. For operation 10, make the description Assy. 1 electrode. Uncheck Milestone Operation. Set the Hourly Production Rate to 100 units per hour. In the pop up window check both Move Next Operation and Auto Labor Report. This will set up the item for fully automatic reporting.

4 For operation 15, change the work center to 1000, the description to Assy 2nd electrode. Uncheck Milestone Operation. Make the run rate 100 and Uncheck the Comments box. In the pop up window check both Move Next Operation and Auto Labor Report.

5 For operation 20, change the work center to 1000, the description to Assy 3rd electrode. Uncheck Milestone Operation. Delete the setup time and set the run rate to 100, In the pop up window check both Move Next Operation and Auto Labor Report.

6 Add operation 25, make the work center to 1000, the description to Assy 4th electrode. Check Milestone Operation box. Set the run rate to 100. In the pop up window check both Move Next Operation and Auto Labor Report. Note the last operation in any route must be a milestone.

7 Review your work with Routing Inquiry (14.13.3). It should look like this.



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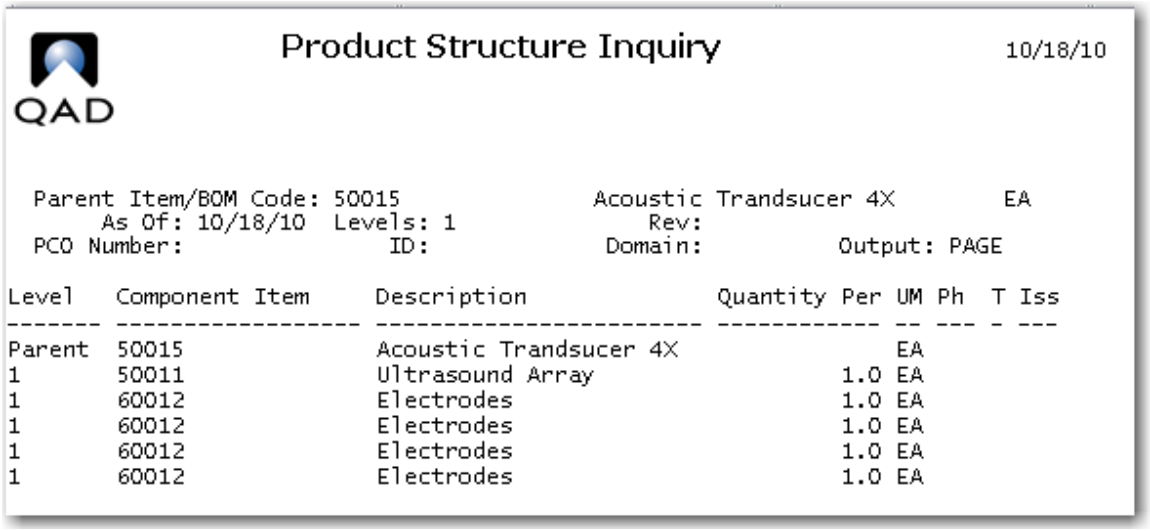
Routing Inquiry 10/18/10

Routing Code: 50015 Acoustic Trandsucer 4X
Effective: 10/18/10 Output: PAGE

Op	Work Center	Machine	Setup	Run Time	Move	Yield%
10	1000 General Assembly Assy. 1 electrode		0.5	0.01	0.0	100.00%
15	1000 General Assembly Assy 2nd electrode		0.0	0.01	0.0	100.00%
20	1000 General Assembly Assy 3rd electrode		0.0	0.01	0.0	100.00%
25	1000 General Assembly Assy 4th electrode		0.0	0.01	0.0	100.00%

8 Use Product Structure Copy (13.9) to copy the structure of the 50010 to the 50015. Note that each of the electrodes 60012 has a reference code.

9 Use Product Structure Maintenance (13.5) to modify the structure of the 50015. Delete the electrodes, 60012, from position 6 and 5. Assign electrode position 1 to operation 10. electrode 2, to operation 15, number 3 to operation 20 and number 4 to operation 25. The ultra sound array should already be assigned to operaion10. Check your work with Product Structure Inquiry (13.6) set for one level. It should look like this.



Product Structure Inquiry 10/18/10

QAD

Parent Item/BOM Code: 50015 Acoustic Trandsucer 4X EA
As Of: 10/18/10 Levels: 1 Rev:
PCO Number: ID: Domain: Output: PAGE

Level	Component Item	Description	Quantity Per	UM	Ph	T	Iss
Parent	50015	Acoustic Trandsucer 4X		EA			
1	50011	Ultrasound Array	1.0	EA			
1	60012	Electrodes	1.0	EA			
1	60012	Electrodes	1.0	EA			
1	60012	Electrodes	1.0	EA			
1	60012	Electrodes	1.0	EA			

10 Use Item Inventory Data Maintenance (1.4.5) for the 60012, delete the L from the Lot/Serial Control: field.

11 Use Product Structure Maintenance (13.5) to modify the structure of the 50011, change the quantity of the 60010 to 100. Save your work.

12 Use Item Inventory Data Maintenance (1.4.5) for the 50011, delete the S from the Lot/Serial Control: field.

13 Use Item Planning Maintenance (1.4.7) to change the yield for the 50011 Ultrasound Array from 95% to 100%.

14 Use Routing Maintenance (14.13.1) to change the yield for the 50011 Ultrasound Array in operation 10 yield from 95% to 100%.

15 Use Item Cost Maintenance (1.4.9) for the 60010, 60011 and the 60012 set the GL standard cost of each to 1.00. Be sure to use the GL Cost Data Set for Site 10-100.

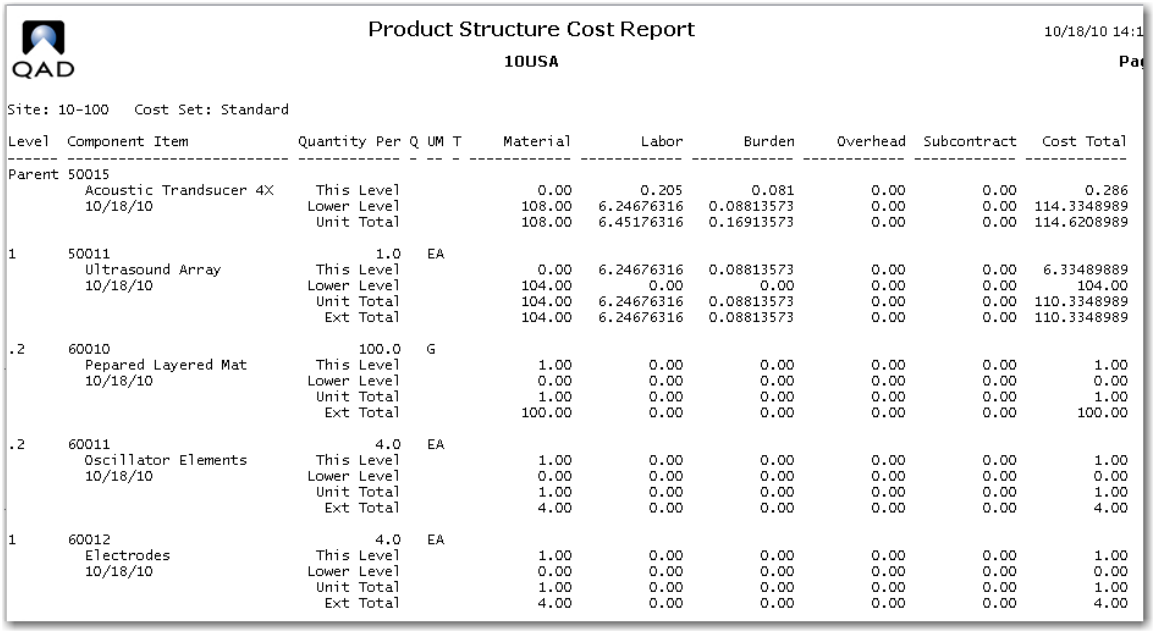
16 Use Work Center Maintenance (14.5) for work center 1000. Change the following values as shown in the table.

Machine Burden Rate:	1.00
Setup Rate:	10.00
Labor Rate:	5.00
Labor Burden Rate:	1.00
Labor Burden%:	0.0

17 Use Routing Cost Roll Up (14.13.13) for Site 10-100 and the Standard Cost Set and Item 50015, to roll up the routing costs.

18 Use Product Structure Cost Roll Up (13.12.13) for Site 10-100 and the Standard Cost Set and the Item 50015, to roll up the component costs.

19 Review your work Using Product Structure Cost Report (13.12.4).



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Product Structure Cost Report

10/18/10 14:1

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Site: 10-100 Cost Set: Standard

Level	Component Item	Quantity Per	Q	UM	T	Material	Labor	Burden	Overhead	Subcontract	Cost Total
Parent	50015										
	Acoustic Trandsucer 4X	This Level				0.00	0.205	0.081	0.00	0.00	0.286
	10/18/10	Lower Level				108.00	6.24676316	0.08813573	0.00	0.00	114.3348989
		Unit Total				108.00	6.45176316	0.16913573	0.00	0.00	114.6208989
1	50011	1.0		EA							
	Ultrasound Array	This Level				0.00	6.24676316	0.08813573	0.00	0.00	6.33489889
	10/18/10	Lower Level				104.00	0.00	0.00	0.00	0.00	104.00
		Unit Total				104.00	6.24676316	0.08813573	0.00	0.00	110.3348989
		Ext Total				104.00	6.24676316	0.08813573	0.00	0.00	110.3348989
.2	60010	100.0		G							
	Pepared Layered Mat	This Level				1.00	0.00	0.00	0.00	0.00	1.00
	10/18/10	Lower Level				0.00	0.00	0.00	0.00	0.00	0.00
		Unit Total				1.00	0.00	0.00	0.00	0.00	1.00
		Ext Total				100.00	0.00	0.00	0.00	0.00	100.00
.2	60011	4.0		EA							
	Oscillator Elements	This Level				1.00	0.00	0.00	0.00	0.00	1.00
	10/18/10	Lower Level				0.00	0.00	0.00	0.00	0.00	0.00
		Unit Total				1.00	0.00	0.00	0.00	0.00	1.00
		Ext Total				4.00	0.00	0.00	0.00	0.00	4.00
1	60012	4.0		EA							
	Electrodes	This Level				1.00	0.00	0.00	0.00	0.00	1.00
	10/18/10	Lower Level				0.00	0.00	0.00	0.00	0.00	0.00
		Unit Total				1.00	0.00	0.00	0.00	0.00	1.00
		Ext Total				4.00	0.00	0.00	0.00	0.00	4.00

20 Use Simulated Picklist Item Check (13.8.17) for item 50015. Check to see if there is enough inventory to build 5,000 of the item 50015.

21 Use Unplanned Receipts (3.9) to receive 5,000 of item 50011 and 20,000 of item 60012.

Exercise 3: Report Repetitive Production

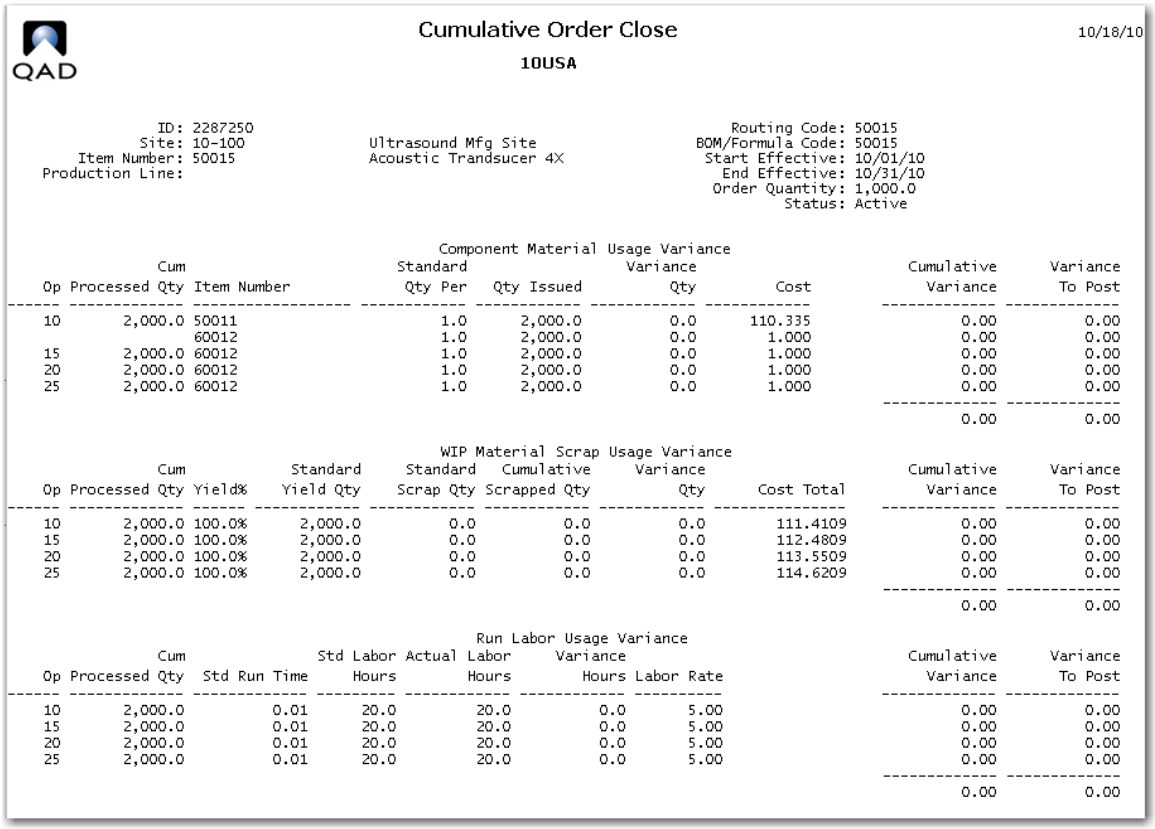
Your new item is set up for fully automatic labor reporting. By reporting completed units at the last operation the system will issue all the components at the operations they are linked to and report all the labor for those operations at standard.

1 Use Setup Labor Transaction (18.22.15) to report 0.5 hours of setup labor for the 50015 at operation 10. Use Employee 10-EMP02. Let the effective date default to today, set the site to 10-100, the Item number to 50015, operation 10, leave Line: blank and enter 50015 for both Routing and BOM Code. As you key Enter or Click Next, the system assigns an ID number. Enter 0.5 in the Act Setup Time: field.

   The ID number assigned will be used for all reporting for this: item, site, route, BOM and Line, until the cumulative order is closed.

2 Use Backflush Transaction (18.22.13) to report production. Complete the header the same as for reporting setup, except you are now reporting operation 25. Report 2,000 units processed.

3 Close the Cumulative Order using Cumulative Order Close (18.22.10). Make the End Effective Date the last day of the current period. Check the Update box. Review the report produced by the close transaction.



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Cumulative Order Close 10/18/10

10USA

ID: 2287250
Site: 10-100 Ultrasound Mfg Site
Item Number: 50015 Acoustic Transducer 4X
Production Line:
Routing Code: 50015
BOM/Formula Code: 50015
Start Effective: 10/01/10
End Effective: 10/31/10
Order Quantity: 1,000.0
Status: Active

Component Material Usage Variance

Op	Cum Processed Qty	Item Number	Standard Qty Per	Qty Issued	Variance Qty	Variance Cost	Cumulative Variance	Variance To Post
10	2,000.0	50011	1.0	2,000.0	0.0	110.335	0.00	0.00
		60012	1.0	2,000.0	0.0	1.000	0.00	0.00
15	2,000.0	60012	1.0	2,000.0	0.0	1.000	0.00	0.00
20	2,000.0	60012	1.0	2,000.0	0.0	1.000	0.00	0.00
25	2,000.0	60012	1.0	2,000.0	0.0	1.000	0.00	0.00
							0.00	0.00

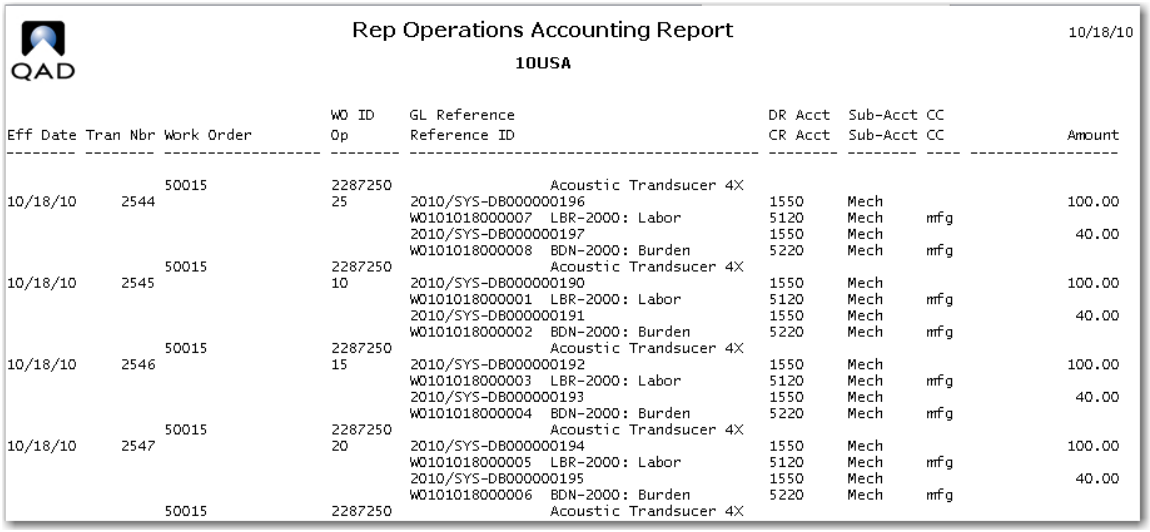
WIP Material Scrap Usage Variance

Op	Cum Processed Qty	Yield%	Standard Yield Qty	Standard Scrap Qty	Cumulative Scrapped Qty	Variance Qty	Cost Total	Cumulative Variance	Variance To Post
10	2,000.0	100.0%	2,000.0	0.0	0.0	0.0	111.4109	0.00	0.00
15	2,000.0	100.0%	2,000.0	0.0	0.0	0.0	112.4809	0.00	0.00
20	2,000.0	100.0%	2,000.0	0.0	0.0	0.0	113.5509	0.00	0.00
25	2,000.0	100.0%	2,000.0	0.0	0.0	0.0	114.6209	0.00	0.00
								0.00	0.00

Run Labor Usage Variance

Op	Cum Processed Qty	Std Run Time	Std Labor Hours	Actual Labor Hours	Variance Hours	Labor Rate	Cumulative Variance	Variance To Post
10	2,000.0	0.01	20.0	20.0	0.0	5.00	0.00	0.00
15	2,000.0	0.01	20.0	20.0	0.0	5.00	0.00	0.00
20	2,000.0	0.01	20.0	20.0	0.0	5.00	0.00	0.00
25	2,000.0	0.01	20.0	20.0	0.0	5.00	0.00	0.00
							0.00	0.00

4 Review the Repetitive Operations Accounting Report (18.22.4.9). This report gives a detailed list of the debits and credits generated to account of this production.



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Rep Operations Accounting Report 10/18/10

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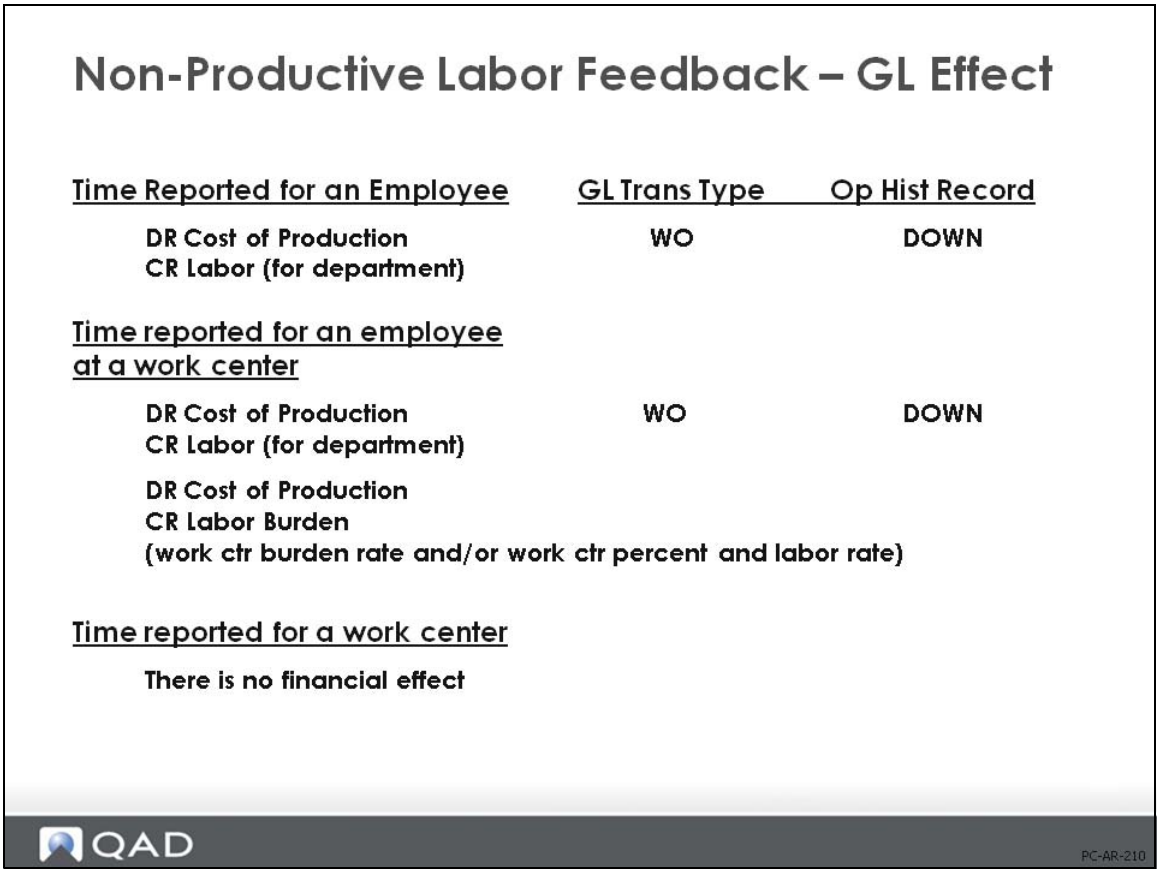
Eff Date	Tran Nbr	Work Order	WO ID / Op	GL Reference / Reference ID	DR Acct / CR Acct	Sub-Acct / Sub-Acct	CC / CC	Amount
		50015	2287250	Acoustic Trandsucer 4X				
10/18/10	2544		25	2010/SYS-DB000000196	1550	Mech		100.00
				W0101018000007 LBR-2000: Labor	5120	Mech	mfg	
				2010/SYS-DB000000197	1550	Mech		40.00
				W0101018000008 BDN-2000: Burden	5220	Mech	mfg	
		50015	2287250	Acoustic Trandsucer 4X				
10/18/10	2545		10	2010/SYS-DB000000190	1550	Mech		100.00
				W0101018000001 LBR-2000: Labor	5120	Mech	mfg	
				2010/SYS-DB000000191	1550	Mech		40.00
				W0101018000002 BDN-2000: Burden	5220	Mech	mfg	
		50015	2287250	Acoustic Trandsucer 4X				
10/18/10	2546		15	2010/SYS-DB000000192	1550	Mech		100.00
				W0101018000003 LBR-2000: Labor	5120	Mech	mfg	
				2010/SYS-DB000000193	1550	Mech		40.00
				W0101018000004 BDN-2000: Burden	5220	Mech	mfg	
		50015	2287250	Acoustic Trandsucer 4X				
10/18/10	2547		20	2010/SYS-DB000000194	1550	Mech		100.00
				W0101018000005 LBR-2000: Labor	5120	Mech	mfg	
				2010/SYS-DB000000195	1550	Mech		40.00
				W0101018000006 BDN-2000: Burden	5220	Mech	mfg	
		50015	2287250	Acoustic Trandsucer 4X				

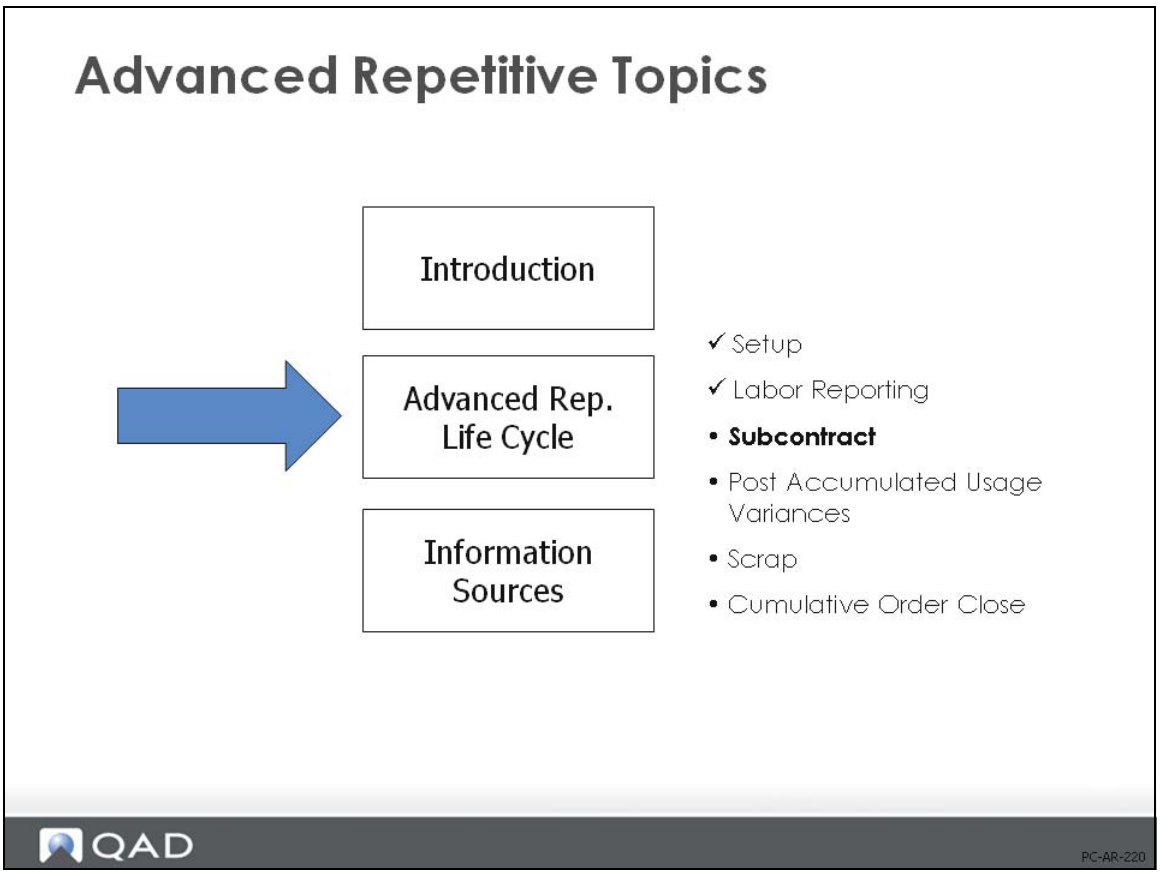
Down Time Transaction



Use Down Time Transaction (18.22.20) to register labor spent due to nonproductive activities associated with a manufacturing operation, such as machine breakdown or material shortage. The value of labor is added to Cost of Production.

A GL record is generated for the labor reported.

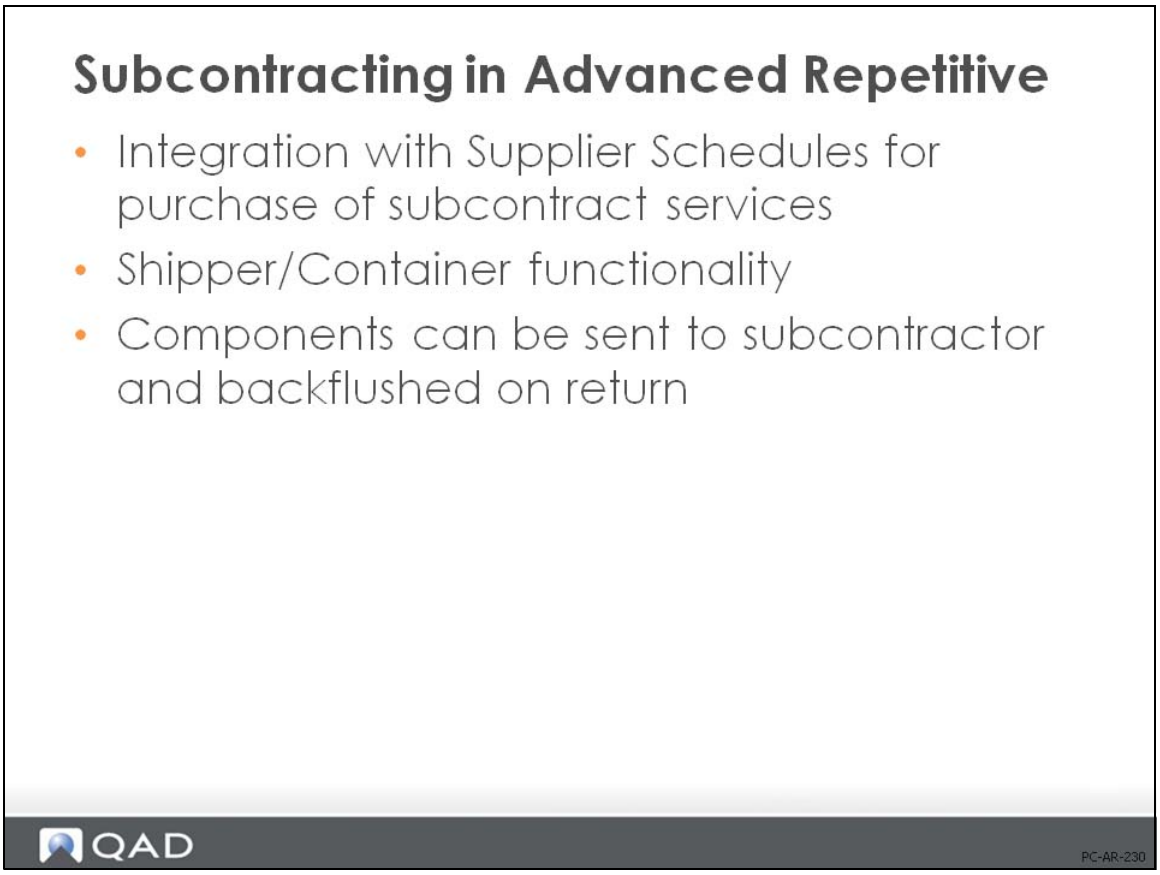
Non-Productive Labor Feedback - GL Effect



Use Non-Productive Labor Feedback (18.22.22) to record non-productive labor for an employee or down time for a work center. For an employee, it is time not directly related to setup or production; time spent in meetings, waiting for work, cleaning up, preventative maintenance. For a work center, it is idle time.

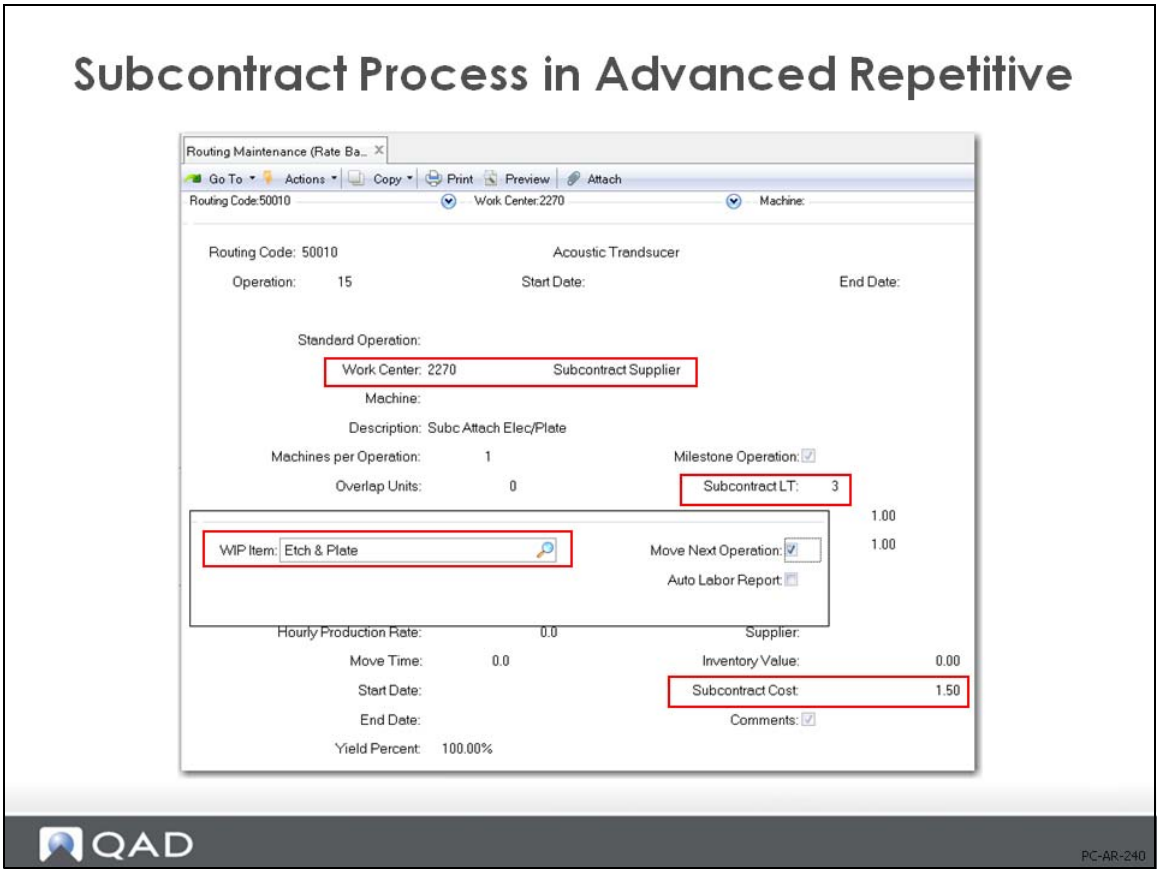
Note Some operations have a defined teardown procedure as well as setup. This can be included as setup time at the last operation or as a separate final operation if you want the time reported.

Time can be reported for an employee, an employee at a specific work center, or for a work center. The financial effects are different for each. As shown in the graphic above.



In Advanced Repetitive, you can have subcontract purchase orders or supplier schedules in conjunction with the repetitive routing. The subcontract operations are similar to discrete capabilities, discussed in the courses on work orders and purchasing.

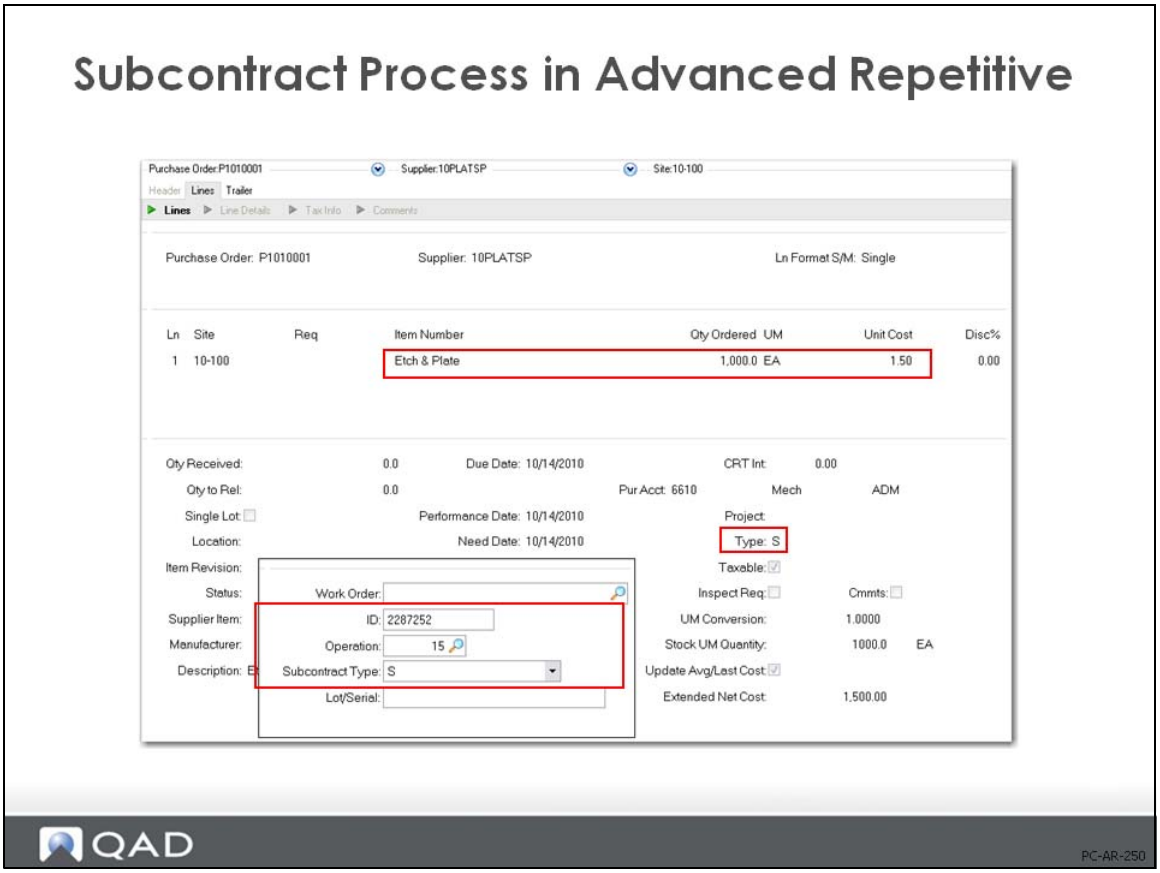
Subcontracting in Advanced Repetitive



All of the processing that occurs prior to the subcontract operation uses standard Advanced Repetitive functions. The last operation reported just prior to the subcontracting operation (milestone or non-milestone) must have Move Next Op set to No. This leaves the WIP in that operation's output queue. Items are then ready to be processed through the subcontract operation.

The subcontracting process and associated GL effects in Advanced Repetitive are discussed on the following pages. For more in-depth training in Advanced Repetitive, please refer to the QAD Advanced Repetitive Training materials.

Subcontract Process in Advanced Repetitive



Routing Maintenance

Routing Maintenance (14.13.1) is where the routings are set up for the parent (manufactured) items. When setting up routings for the advanced repetitive items, there are several fields that are important when implementing a subcontracting operation.

Subcontract Cost. The cost per item of this subcontract operation

Subcontract Lead Time. The lead time that should be included when scheduling the operation. This will also affect manufacturing lead time calculations

WIP Item. This is a “service” item that is set up in the Item Master. It is used primarily with discreet POs. It is for ease of entering a purchase order that will specifically call out the service requested instead of the parent item number that is being sent. (The item that is set up in the Item Master (1.4.1) is a Purchased Type. No need to cost it; the Routing Cost Roll-Up will cost everything correctly. This part is never planned for or transacted through Inventory by the system. For example, a part can be set up called Paint, which indicates purchasing a service of Paint from a supplier.)

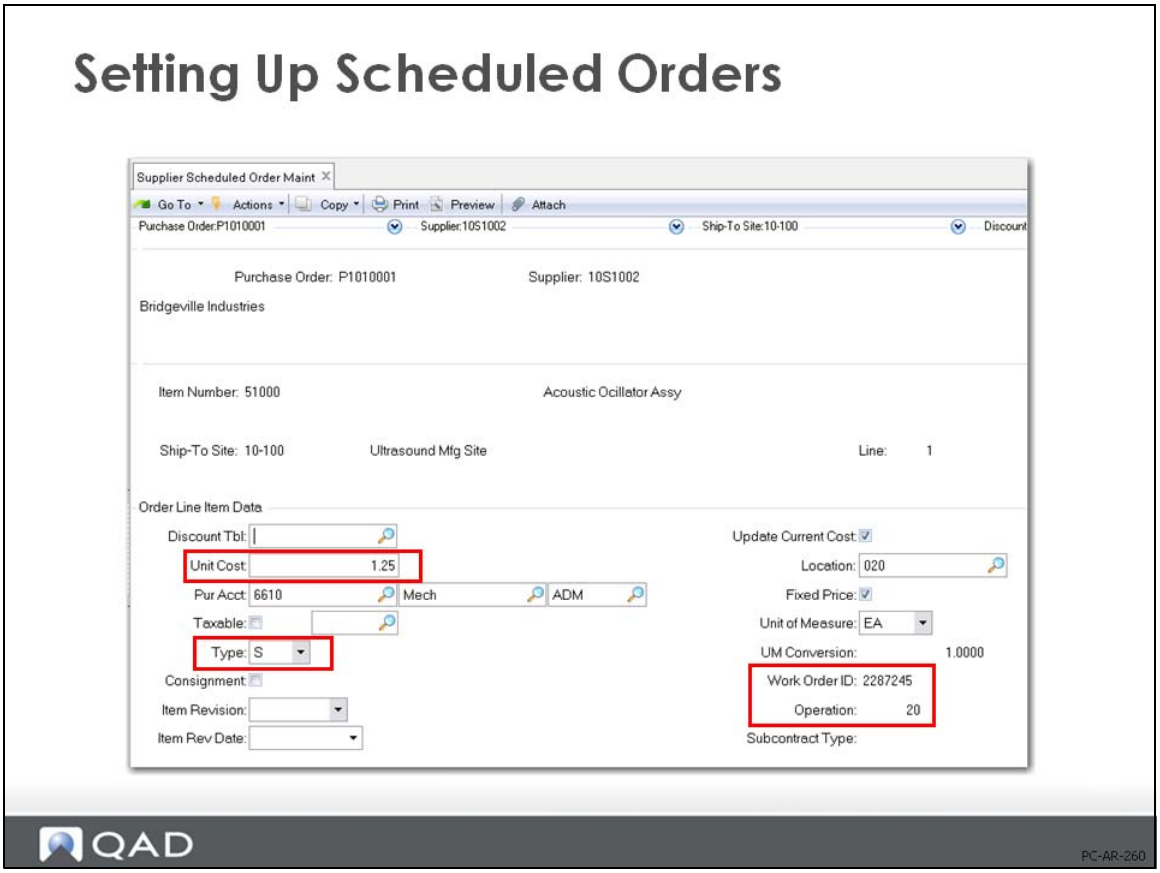
PO and Line. If using Supplier Schedules and not discrete Purchase Orders, the Supplier Scheduled PO number and the line can be entered here. This will give an automatic link to the correct Supplier Schedule. This functionality does not require the use of a WIP Item as there is a direct link between the route and the supplier schedule line item.

Move Next Op. For the subcontract operation, this can be set at either Yes or No. Setting it to Yes will allow the PO Receipt or the Shipper Confirm to move the WIP to the input queue of the next operation. Setting it to No will keep the WIP in the output queue of the subcontract operation after PO Receipt/Confirm Shipper.

Note The Move Next Op field at the milestone operation prior to the subcontracting operation must be set to No. The subcontract shipper will transfer WIP from the output queue of the previous milestone (reported) operation before the subcontract operation into the input queue of the subcontract operation.

Auto Labor Report. For subcontracting, no labor is usually associated with this. Setting this field is optional.

Setting Up Scheduled Orders



You can handle the purchasing side of a subcontract operation through a supplier schedule. Create supplier-scheduled purchase orders using Scheduled Order Maintenance (5.5.1.13).

Set the Ship-To site to the repetitive schedule site and create a line for the subcontract item with a line type of S (Subcontract). In the Work Order ID field, enter the cumulative order ID associated with the subcontract items. You can create cumulative orders manually in Cumulative Order Maintenance (18.22.6) or automatically in Backflush Transaction (18.22.13).

Set the item number on the scheduled order line to one of the following:

- The end-item number from the repetitive schedule
- The WIP item specified in the routing operation

Use WIP item to represent services being purchased; for example, heat-treat-service. Using WIP items helps ensure consistent pricing for subcontract services. Set up WIP items in the item master before entering them on the supplier schedules.

Shipping Subcontract Items

You can use the functions on the Subcontract Shipping menu (18.22.5) to record shipments to subcontractors. These programs create shippers in the same way as the container and shipper maintenance programs associated with sales orders and customer schedules. The major difference is in the Contents (Items) frame. Work Order ID, Operation, and Item replace Item, PO, Order, and

Line. The Work Order ID and Operation fields identify a subcontract operation record on a cumulative order. The Item field identifies any component items used at the operation. If Item is blank, it represents the WIP material input at that operation.

Receiving Completed Subcontract Items

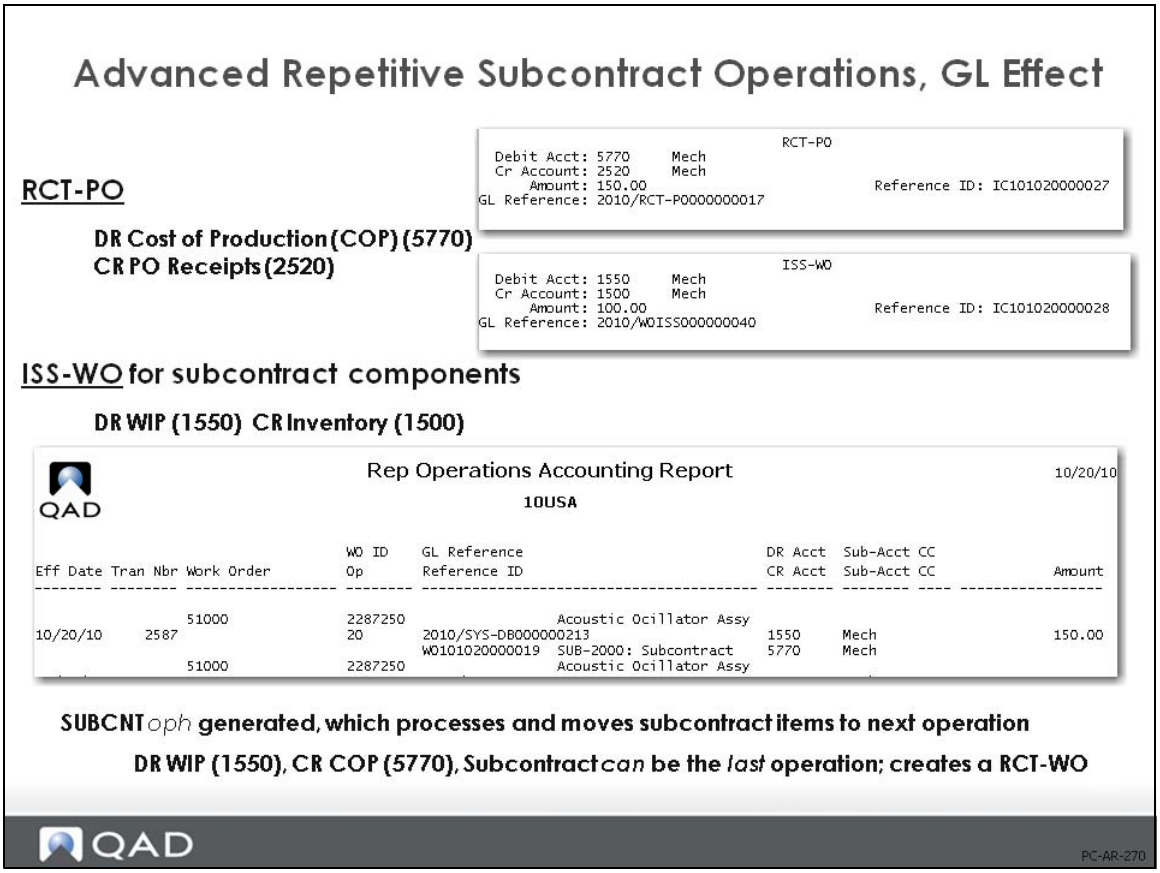
Receive shipments from subcontractors using the functions on the Receipts Processing Menu (5.5.5) or Purchase Order Receipts (5.13.1). Any components associated with the subcontract operation are automatically backflushed.

For scheduled orders, create a shipper in PO Shipper Maintenance (5.5.5.5). Reference the item that is on the supplier schedule. Confirm the shipper using PO Shipper Receipt (5.5.5.11). This moves the WIP to the input queue of the next operation (if Move Next Op is yes in the cumulative order routing) backflushes the components associated with that operation, and closes out the subcontract operation for that quantity. The appropriate GL transactions, transaction history records, and operation history records are generated.

Alternatively, receive the purchase order using Purchase Order Receipts (5.13.1). This creates the same GL transactions and backflushes the components. With this approach, the purchase order does not need to be a scheduled order. You can create it using Purchase Order Maintenance (5.7) and use a line type of S (Subcontract) for each subcontract line. This is the method used in the Advanced Repetitive Subcontracting exercise.

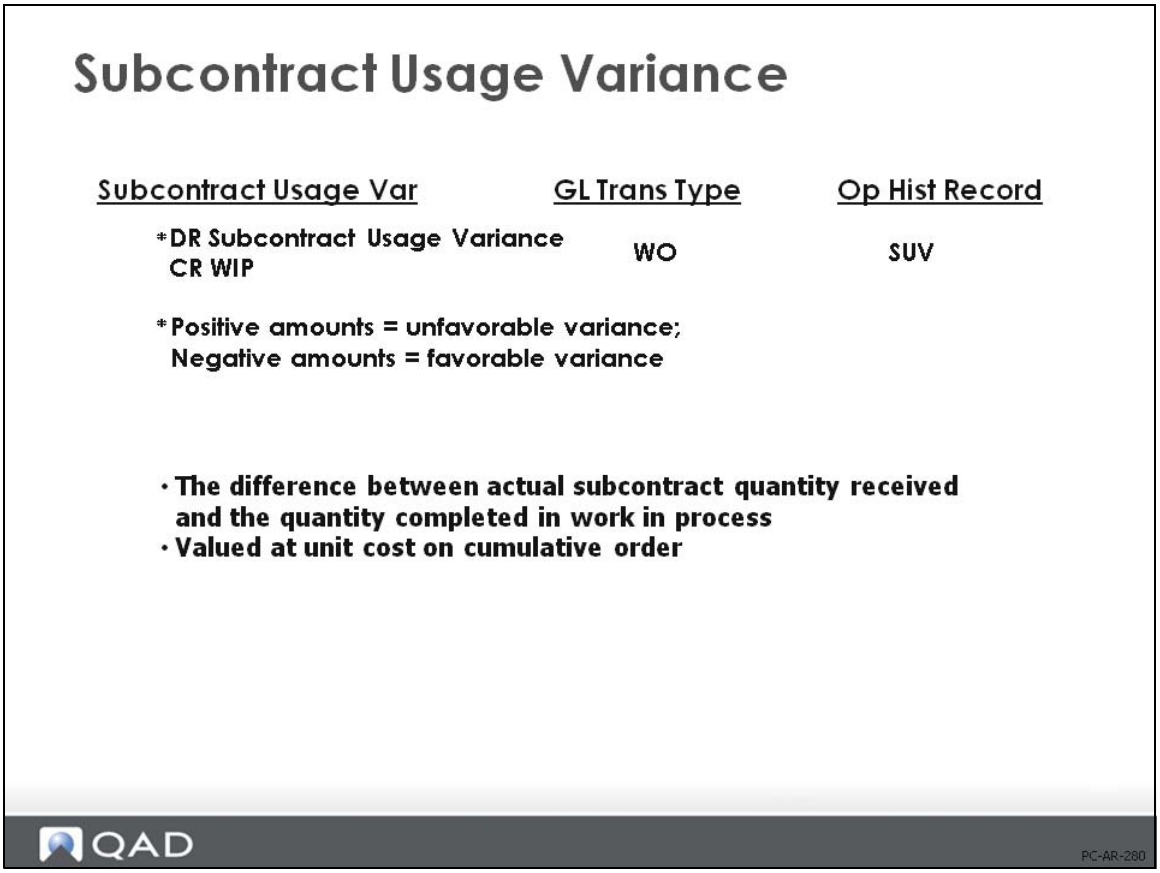
Note These programs do not post subcontract usage variances. That is posted by Post Accumulated Usage Variances.

Advanced Repetitive Subcontract Operations - GL Effect



The GL effects for Advanced Repetitive subcontract operations are shown above.

Subcontract Usage Variance



Subcontract usage variances are posted by Post Accumulated Usage Variances, discussed in the next section.

In the case of high volume repetitive manufacturing with subcontract operations where items are being shipped to, and received from, your subcontractor on a daily or even hourly basis, it is possible for the subcontractor to occasionally get units from one shipment mixed up with units from another. This allows you to perhaps receive more of less of an item than you shipped. This will result in a usage variance if left unresolved.

Exercise 4: Subcontract Operations in Repetitive

In this exercise, you will set up a repetitive order with a subcontract operation and link the operation to a scheduled purchase order. In repetitive manufacturing with daily production and subcontract operation, using scheduled orders makes it very easy to track and cost WIP as it moves out to the vendor and back to your next production operation.

1. You will use item 50010, the Acoustic Transducer, for this exercise. It has three operations, the middle one being a subcontract operation. Use Item Inventory Data Maintenance (1.4.5) for the 50010 and delete the S in the Lot/Serial Control field.

2. Review the routing for item 50010 using Routing Maintenance (14.13.1). Note that operation 15 occurs in work center 2270, which is a subcontract work center. It has no standard times, but does have a subcontract lead time and a subcontract cost of 0.20. It is flagged as a milestone, meaning you want its completion reported. You can Uncheck the comments box. In the second frame the Move Next Operation is checked and there is not a WIP item.

3. Review the routing for item 50010 operation 10. Milestone is Checked as you always want to report the operation before a subcontract operation. In the second frame you will Uncheck the Move Next Operation box as you want the quantity reported to remain in WIP at this operation while the work is outside the company. It will be moved to the operation after the subcontract operation when the items are received back.

4. This item is set up for WIP Lot Trace. Use Routing Registration Maintenance (3.22.13.1) for Routing Code 50010. Click Next until the Delete Button appears, Delete the record.

5. Create the cumulative work order. As you do not have a repetitive schedule the easy way to create the cumulative order is to report production.

   Use Backflush Transaction (18.22.13), employee 10-EMP02, effective date, today, site 10-100, item 50010, operation 10, routing and BOM code 50010. Note the ID number assigned. Report 100 units processed.

   Review WIP Status Report for your ID. It should show 100 units processed at operation 10 and 100 as the Current Quantity.

6. Set up the Scheduled Order. When using discrete purchase orders you can set up a WIP Item code for the service you are purchasing. This allows you to put that item code on the WIP Item field of the operation and as the line item on the subcontract purchase order. However, with a Scheduled Subcontract Order, the line item will include the work order ID and the operation number.

   Use Supplier Scheduled Order Maintenance (5.5.1.13) to set up the subcontract supplier schedule. You will need to enter the supplier code in the second field before the system will assign the PO number automatically. Use supplier 10PLATSP, Plating Subcontractor-USA. Note the PO number assigned.

   In the first frame change the AP site to 10-100. Accept all other values at default. Click Next at Tax Usage.

   In the Item frame enter 50010, Ship To Site 10-100, and Line 1. Advance to the next frame. In the Unit Cost field enter 0.20. In the Type field enter S for subcontract. In the Work Order ID: field enter your cumulative order ID. In the Operation field enter 15. Click Next through the last frame.

7 In the real world, you would use the Subcontract Shipping Transactions to ship items to your vendor. In this case, however, you will take a shortcut.

Use Purchase Order Receipt (5.13.1) to receive 100 units against your PO. Note the header defaults to Move Next Operation. Advance to the line item frame, enter line 1 and receive 100 units. You will see a warning that there is no active schedule.

Review the WIP Status Report, you see the 100 units processed and moved out at operation 15 and moved in at operation 20.

Op	Operation Description	Mile Stone	Input Queue	Quantity	Output Queue	Quantity	Reject Queue	Quantity
15	Subc Attach Elec/Plate	yes	Begin Qty	0.0	Begin Qty	0.0	Begin Qty	0.0
			+Moved In	0.0	+Processed	100.0	+Rejected	0.0
			-Processed	100.0	+Reworked	0.0	-Reworked	0.0
			Current Qty	-100.0	-Rejected	0.0	-Scrapped	0.0
					-Moved Out	100.0	-Adjusted	0.0
					-Scrapped	0.0	Current Qty	0.0
					-Adjusted	0.0		
					Current Qty	0.0		

Op	Operation Description	Mile Stone	Input Queue	Quantity	Output Queue	Quantity	Reject Queue	Quantity
20	TEST ACOUSTIC TRANSDUCER	yes	Begin Qty	0.0	Begin Qty	0.0	Begin Qty	0.0
			+Moved In	100.0	+Processed	0.0	+Rejected	0.0
			-Processed	0.0	+Reworked	0.0	-Reworked	0.0
			Current Qty	100.0	-Rejected	0.0	-Scrapped	0.0
					-Moved Out	0.0	-Adjusted	0.0
					-Scrapped	0.0	Current Qty	0.0
					-Adjusted	0.0		
					Current Qty	0.0		

8 Use the Backflush Transaction to report 100 units complete at operation 20. Review the WIP Status Report. You see the 100 units processed and moved out at operation 20 and the Current Quantity as zero.

Op	Operation Description	Mile Stone	Input Queue	Quantity	Output Queue	Quantity	Reject Queue	Quantity
15	Subc Attach Elec/Plate	yes	Begin Qty	0.0	Begin Qty	0.0	Begin Qty	0.0
			+Moved In	0.0	+Processed	100.0	+Rejected	0.0
			-Processed	100.0	+Reworked	0.0	-Reworked	0.0
			Current Qty	-100.0	-Rejected	0.0	-Scrapped	0.0
					-Moved Out	100.0	-Adjusted	0.0
					-Scrapped	0.0	Current Qty	0.0
					-Adjusted	0.0		
					Current Qty	0.0		

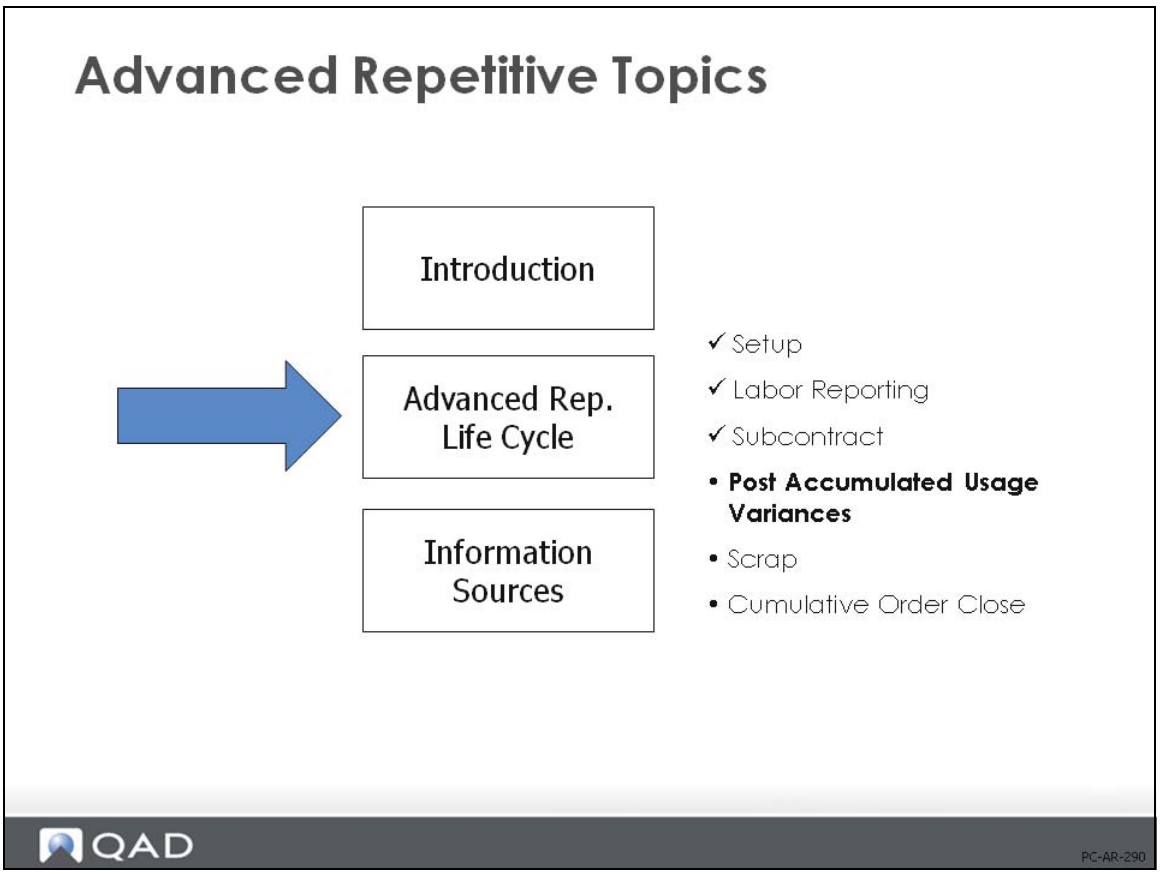
Op	Operation Description	Mile Stone	Input Queue	Quantity	Output Queue	Quantity	Reject Queue	Quantity
20	TEST ACOUSTIC TRANSDUCER	yes	Begin Qty	0.0	Begin Qty	0.0	Begin Qty	0.0
			+Moved In	100.0	+Processed	100.0	+Rejected	0.0
			-Processed	100.0	+Reworked	0.0	-Reworked	0.0
			Current Qty	0.0	-Rejected	0.0	-Scrapped	0.0
					-Moved Out	100.0	-Adjusted	0.0
					-Scrapped	0.0	Current Qty	0.0
					-Adjusted	0.0		
					Current Qty	0.0		

9 Use Supplier Scheduled Order Maintenance (5.5.1.13) to change the cost of the outside process. For your PO, advance to the line item detail frame and change the Unit Cost to 0.50.

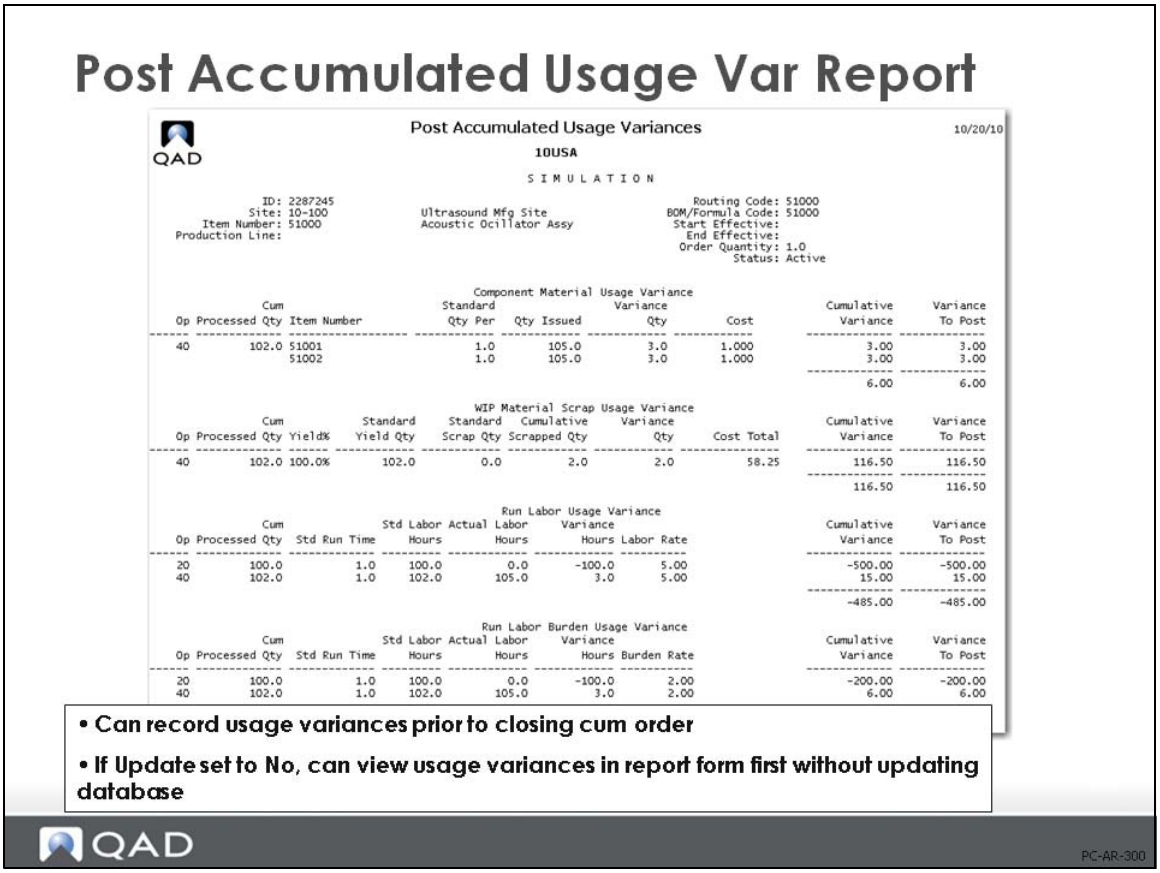
10 Use Backflush Transaction (18.22.13) to process another 100 units at operation 10. Use Purchase Order Receipt (5.13.1) to receive 100 units on your PO. Use the Backflush transaction to process another 100 units at operation 20.

11 Close the cumulative order. Review the Cumulative Order Close Report, the Repetitive Operations Report (18.22.4.9) and the Operation Transaction Detail Inquiry (18.22.4.2).

Post Accumulated Usage Variances



Post Accumulated Usage Variances Report



Post Accumulated Usage Variances (18.22.9) calculates and records accumulated usage variances in cumulative orders according to the criteria entered. This lets you report usage variances on demand without having to close the cumulative order.

For each open cumulative order selected, usage variances are calculated by operation for component material (including scrap), WIP labor, labor burden, and subcontract. The variances calculated are for the entire life of the cumulative order. The amounts to report are reduced by any amounts previously reported. Additionally, floor stock expense is reported. An operation history record is created for each variance.

Component Material Usage Variance

Component material usage variance is calculated as the difference between the actual and expected quantities issued, extended by the cumulative order operation component cost. The expected issue quantity is the cumulative order operation standard quantity required times the quantity processed at the operation. Component materials issued that are not in the cumulative order operation product structure are considered non-standard and are treated entirely as usage variance.

Labor and Burden Usage Variances

Labor and burden usage variances are calculated as the difference between actual and expected labor hours, multiplied by the frozen standard setup and labor rates in the case of labor usage variance and, in the case of burden usage variance, multiplied by setup and labor burden rates.

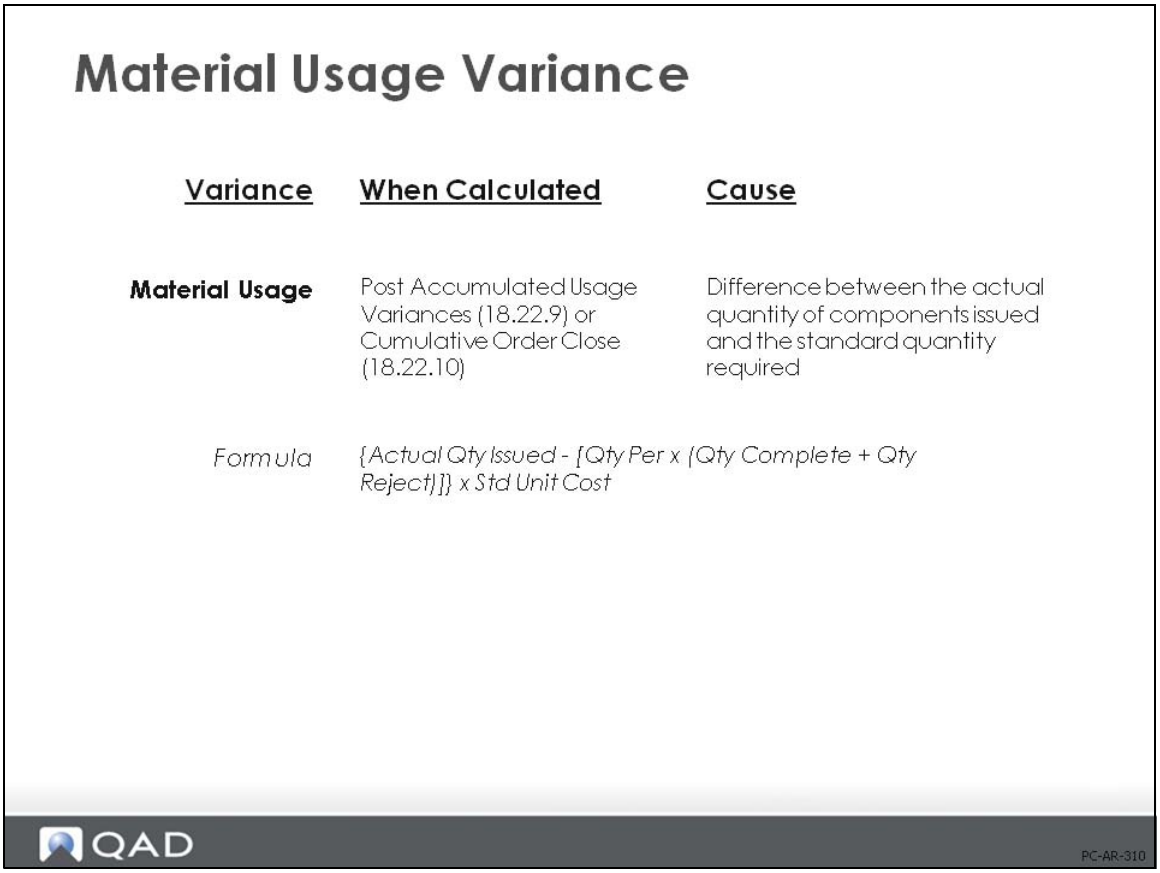
WIP Material Scrap Usage Variance

WIP material scrap usage variance is calculated as the difference between the actual and expected scrap quantities, extended by the cumulative order operation cost. The expected scrap quantity is the quantity processed, less the cumulative order yielded quantity processed at the operation. For example, if the yield factor at an operation is 75% and 100 were processed at the operation, the expected scrap quantity would be 100 less 75% = 25. The amount of variance is added to the Scrap account of the product line of the finished material item number.

- It is possible to scrap a quantity without producing a scrap posting. Consider the above example, when yield is 75% and the expected scrap quantity is 25. If the actual quantity scrapped is 25, then no variance results. If there is no labor or component usage variance elsewhere, WIP is charged with exactly the amount of resources expected to produce 75. This is reflected in the fact that the operation cost has already been yielded.

If scrap is always reported regardless of yield, then the Include Yield field in Advanced Repetitive Control (18.22.24) should be set to No. This sets the cumulative order yields to 100%.

Material Usage Variance

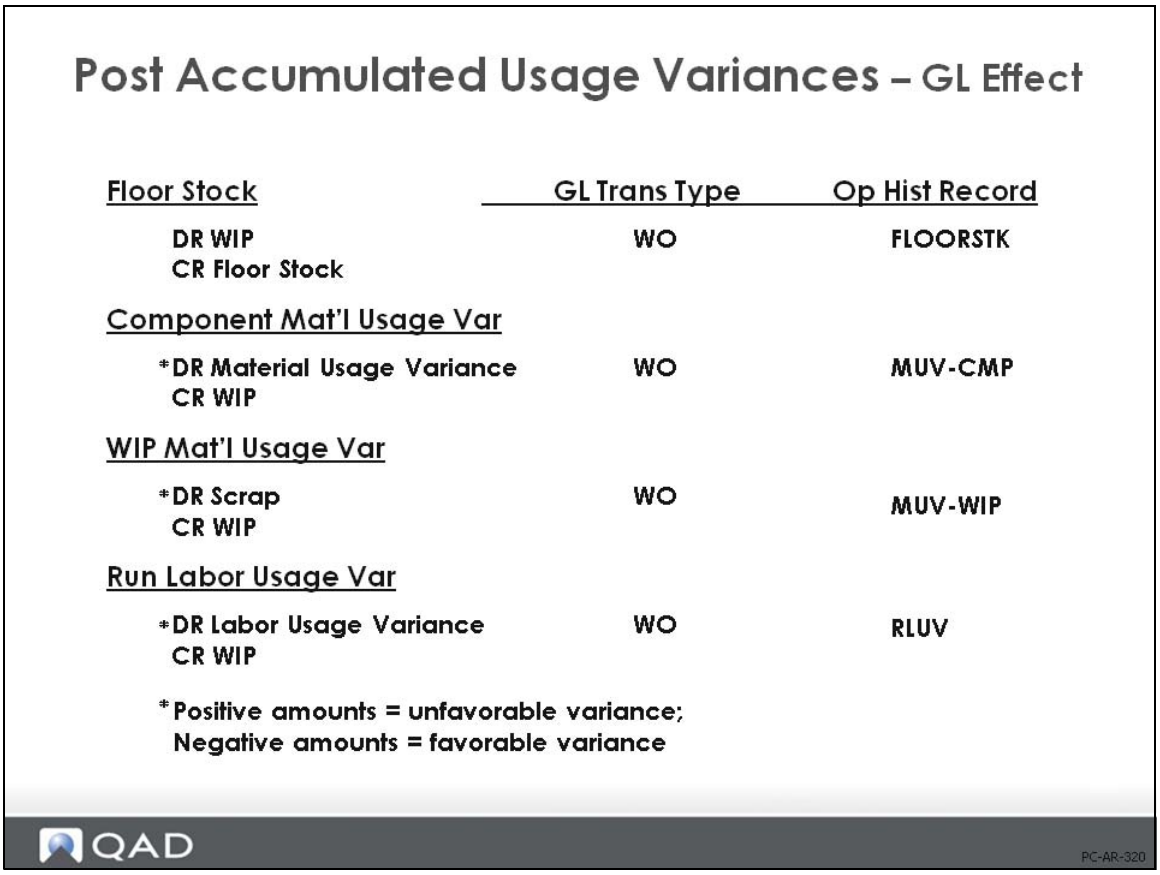


Material usage variance is generated when there is a difference between the actual quantity of components issued/backflushed and the standard quantity required.

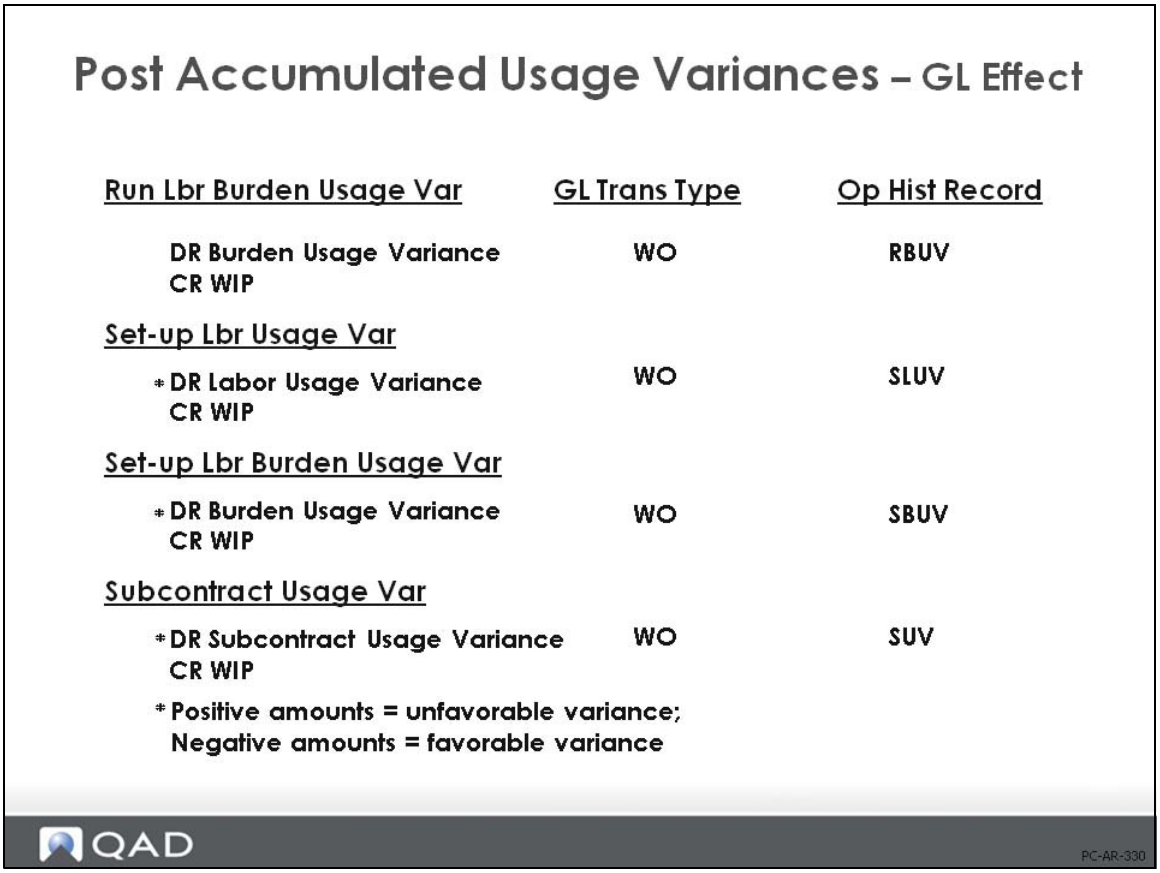
This variance is calculated at Post Accumulated Usage Variances (18.22.9) or Cumulative Order Close (18.22.10) as:

*{Actual Qty Issued - [Qty Per * (Qty Complete + Qty Reject)]} * Frozen Std Unit Cost*

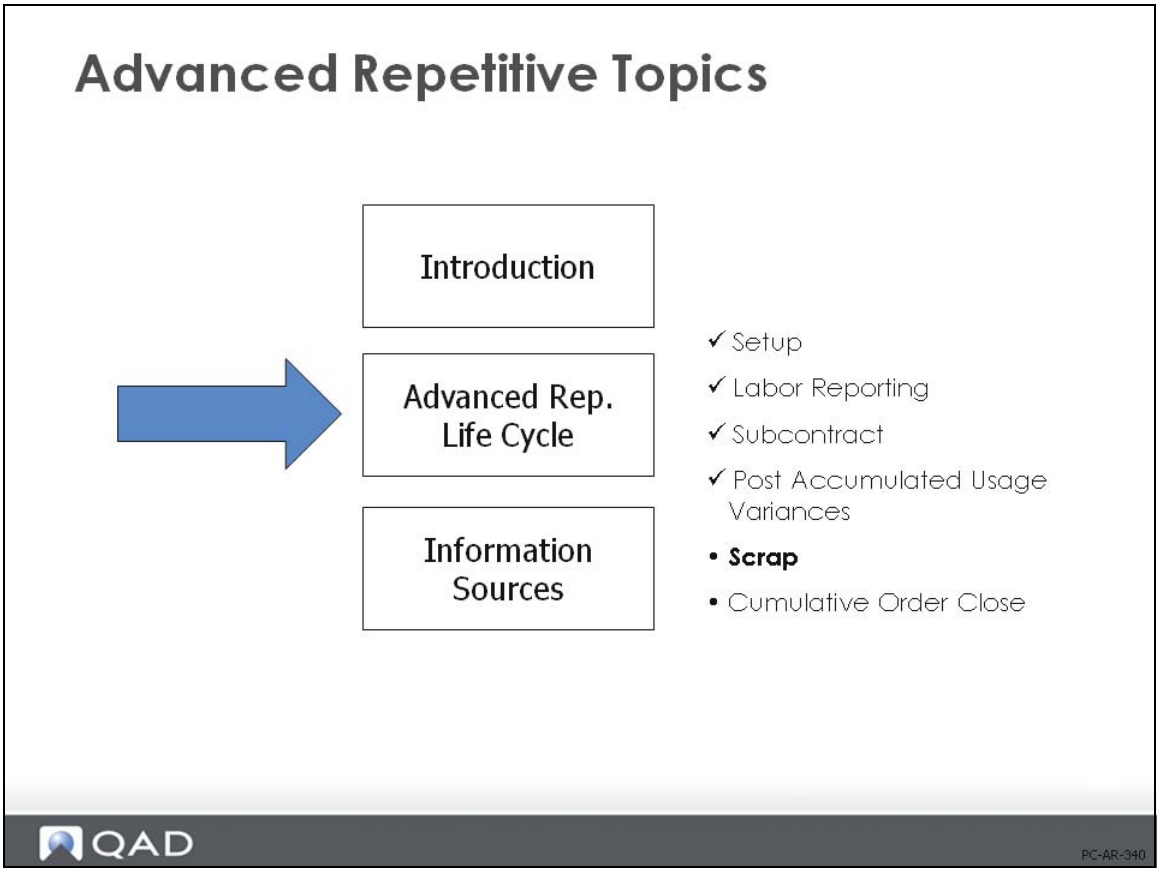
- Alternate structures and issues of non-standard components will also create material usage variances, and if the costs differ from standard, a method change variance will be charged for that difference
- Specifying an alternate BOM/routing at backflush will generate a new cumulative order


Post Accumulated Usage Variances – GL Effect
Floor Stock
GL Trans Type
Op Hist Record
DR WIP
CR Floor Stock
WO
FLOORSTK
Component Mat'l Usage Var
*DR Material Usage Variance
CR WIP
WO
MUV-CMP
WIP Mat'l Usage Var
*DR Scrap
CR WIP
WO
MUV-WIP
Run Labor Usage Var
*DR Labor Usage Variance
CR WIP
WO
RLUV
*Positive amounts = unfavorable variance;
Negative amounts = favorable variance
QAD
PC-AR-320

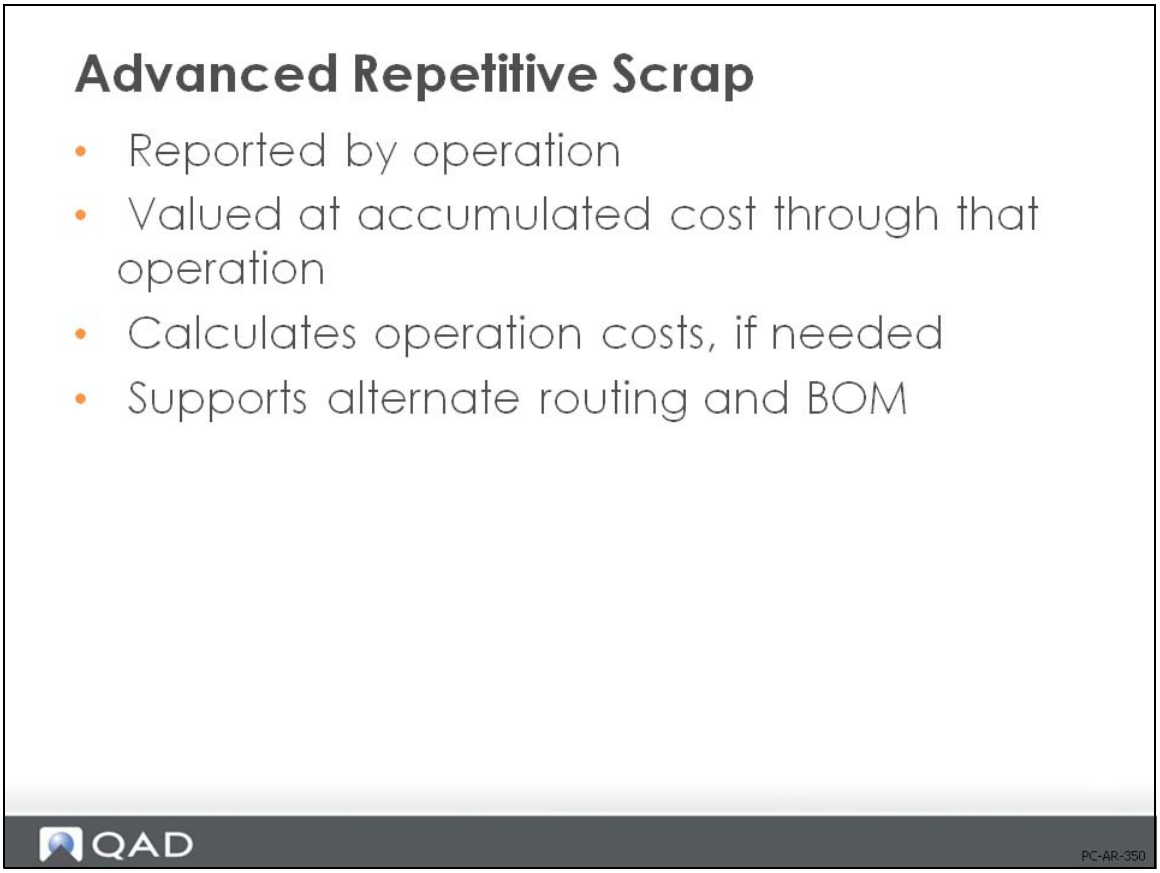
Post Accumulated Usage Variances - GL Effect



Scrap


Advanced Repetitive Topics
Introduction
Advanced Rep. Life Cycle
Information Sources
✓ Setup
✓ Labor Reporting
✓ Subcontract
✓ Post Accumulated Usage Variances
• Scrap
• Cumulative Order Close
QAD
PC-AR-340

Advanced Repetitive Scrap



In Work Orders, we saw that you could report rejected items in the Work Order Receipt transaction. This would scrap them at full GL cost. Otherwise, any in-process losses were simply written off to variance. In Advanced Repetitive, you can monitor the cost of scrap at the operation level.

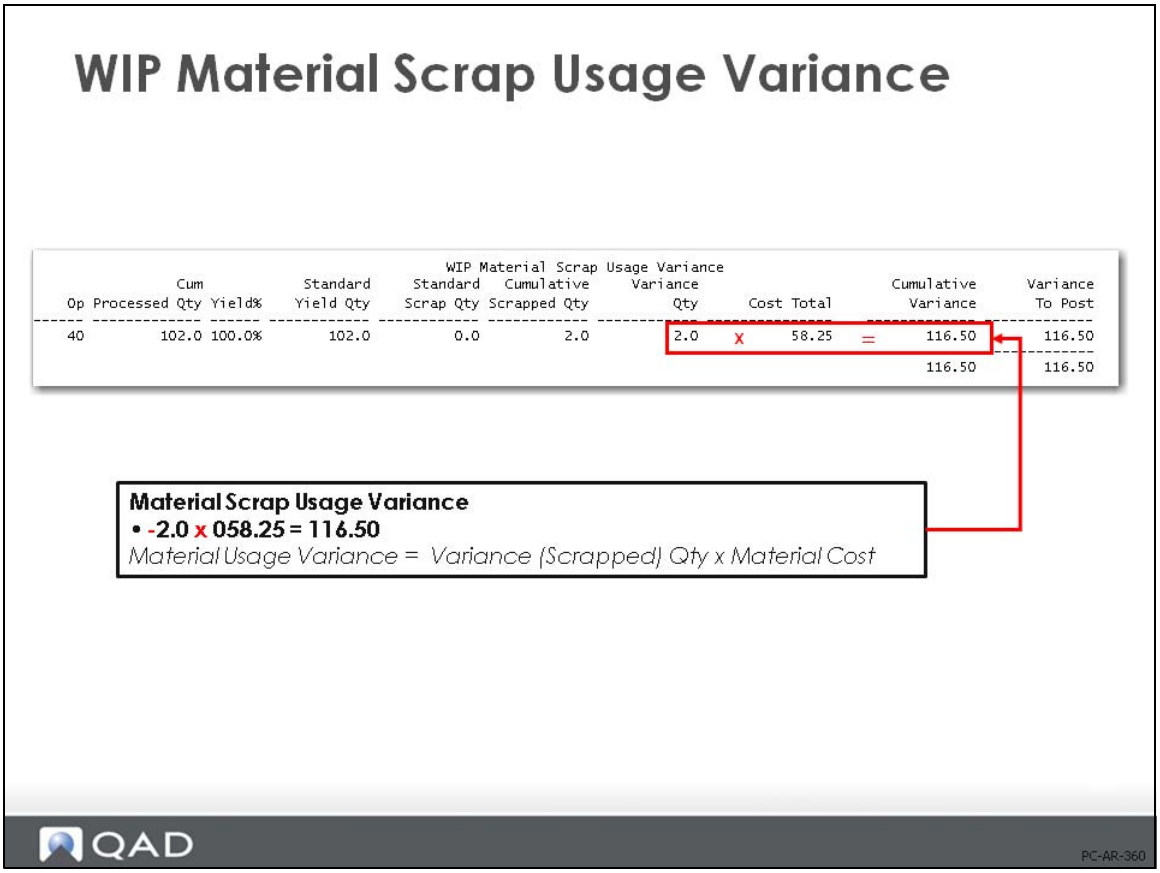
The Advanced Repetitive Scrap Transaction (18.22.18) and Backflush Transaction (18.22.13) report scrap at the item's accumulated cost through the operation where it was scrapped.

Note If you report scrap when using an alternate routing or BOM, the system will calculate operation costs for that alternate and cost the scrap based on those calculated values.

Use Backflush Transaction (18.22.13) for most of your scrap transactions. It backflushes the scrapped units and records all costs at the operation. There must be a quantity in the input queue operation in order to record scrap with this transaction.

Use Scrap Transaction (18.22.18) to scrap from the input, output, or reject queues without backflushing. This transaction is often used to scrap previous rejected units.

Material Scrap Usage Variance



Unlike work orders where no accounting is done for scrap until the Work Order Accounting Close, in Advanced Repetitive, scrap can be reported prior to Cumulative Order Close by running Post Accumulated Usage Variances (18.22.9). The scrap value is determined by multiplying the scrap quantity by the accumulated cost at that operation. This value is then removed from WIP (credit) and added to the Scrap account (debit).

Exercise 5: Report Repetitive Scrap

1 Use Backflush Transaction (18.22.13) to report production and scrap. Make the Effective Date the first of next month, this will force the system to assign a new cumulative order ID. Complete the header the same as before, except you are now reporting operation 15. Report 1,000 units processed, and 5 units scraped.

2 Use WIP Status Inquiry (18.22.12) to review the effect of this transaction on WIP.

Op	Operation Description	Mile Stone	Input Queue	Quantity	Output Queue	Quantity	Reject Queue	Quantity
15	Subc Attach Elec/Plate	yes	Begin Qty	0.0	Begin Qty	0.0	Begin Qty	0.0
			+Moved In	0.0	+Processed	100.0	+Rejected	0.0
			-Processed	100.0	+Reworked	0.0	-Reworked	0.0
			Current Qty	-100.0	-Rejected	0.0	-Scrapped	0.0
					-Moved Out	100.0	-Adjusted	0.0
					-Scrapped	0.0	Current Qty	0.0
					-Adjusted	0.0		
					Current Qty	0.0		

Op	Operation Description	Mile Stone	Input Queue	Quantity	Output Queue	Quantity	Reject Queue	Quantity
20	TEST ACOUSTIC TRANSDUCER	yes	Begin Qty	0.0	Begin Qty	0.0	Begin Qty	0.0
			+Moved In	100.0	+Processed	100.0	+Rejected	0.0
			-Processed	100.0	+Reworked	0.0	-Reworked	0.0
			Current Qty	0.0	-Rejected	0.0	-Scrapped	0.0
					-Moved Out	100.0	-Adjusted	0.0
					-Scrapped	0.0	Current Qty	0.0
					-Adjusted	0.0		
					Current Qty	0.0		

This shows an outline of what happened. 1000 units were moved in; 1000 units were processed; 995 units were moved out and 5 units were scraped at operation 15.

3 Use Scrap Valuation Report (18.22.4.14) to see the value of the scrap.

QAD

Scrap Valuation Report

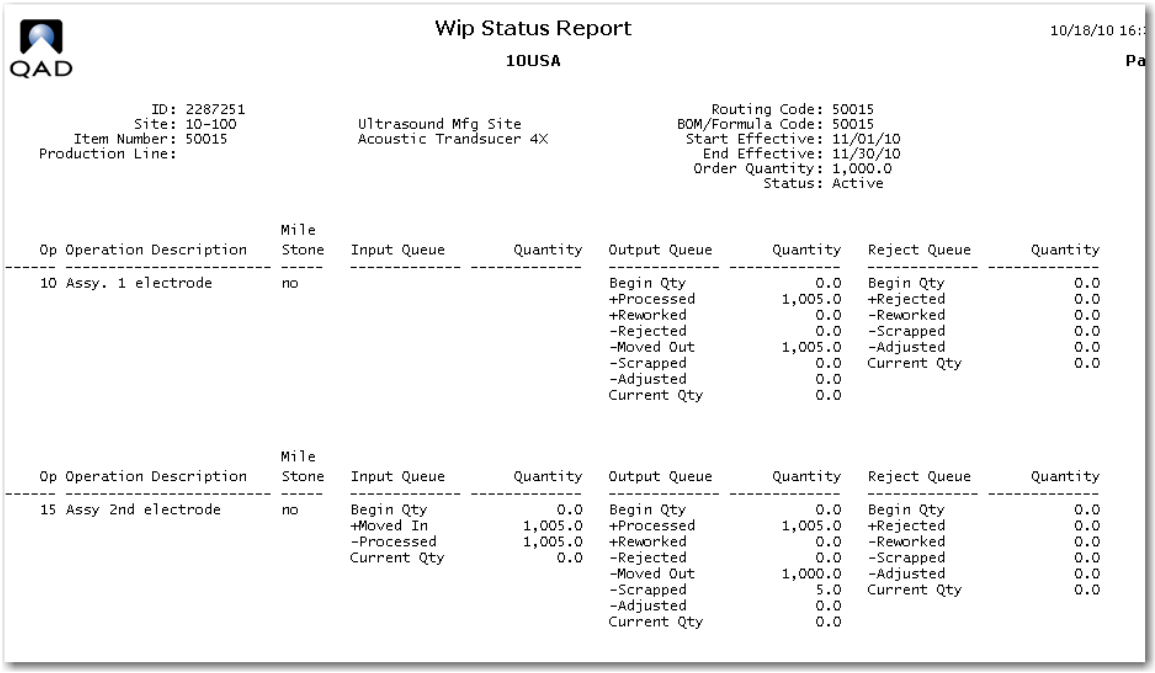
10USA

Site	Item Number	Op	Line	Scrapped Qty	Cost Element	Cost	Extended Cost
10-100	50015	15		5.0	Cost Total	112.4809	562.40
					Item Tot		562.40
					Site Tot		562.40
					Total		562.40

4 Use Backflush Transaction (18.22.13) with the effective date the first of next month, report production and extra labor. Complete the header the same as before, except you are now reporting operation 20. Report 1,000 units processed, and add one hour of Actual Run Time to account for some difficulties you had with production.

5 Use Backflush Transaction (18.22.13) with the effective date the first of next month. Complete the header as before, except you are now reporting operation 25. Report 1,000 units processed.

6 Review the WIP Status Report (18.22.12) you can now see the complete flow of WIP for this order. Note the system has adjusted the moved in and out quantities for operations 10 and 15 to account for the 5 we scraped, yet completed 1000.



Wip Status Report

10/18/10 16:

10USA

Pa

ID: 2287251
Site: 10-100
Item Number: 50015
Production Line:

Ultrasound Mfg Site
Acoustic Trandsucer 4X

Routing Code: 50015
BOM/Formula Code: 50015
Start Effective: 11/01/10
End Effective: 11/30/10
Order Quantity: 1,000.0
Status: Active

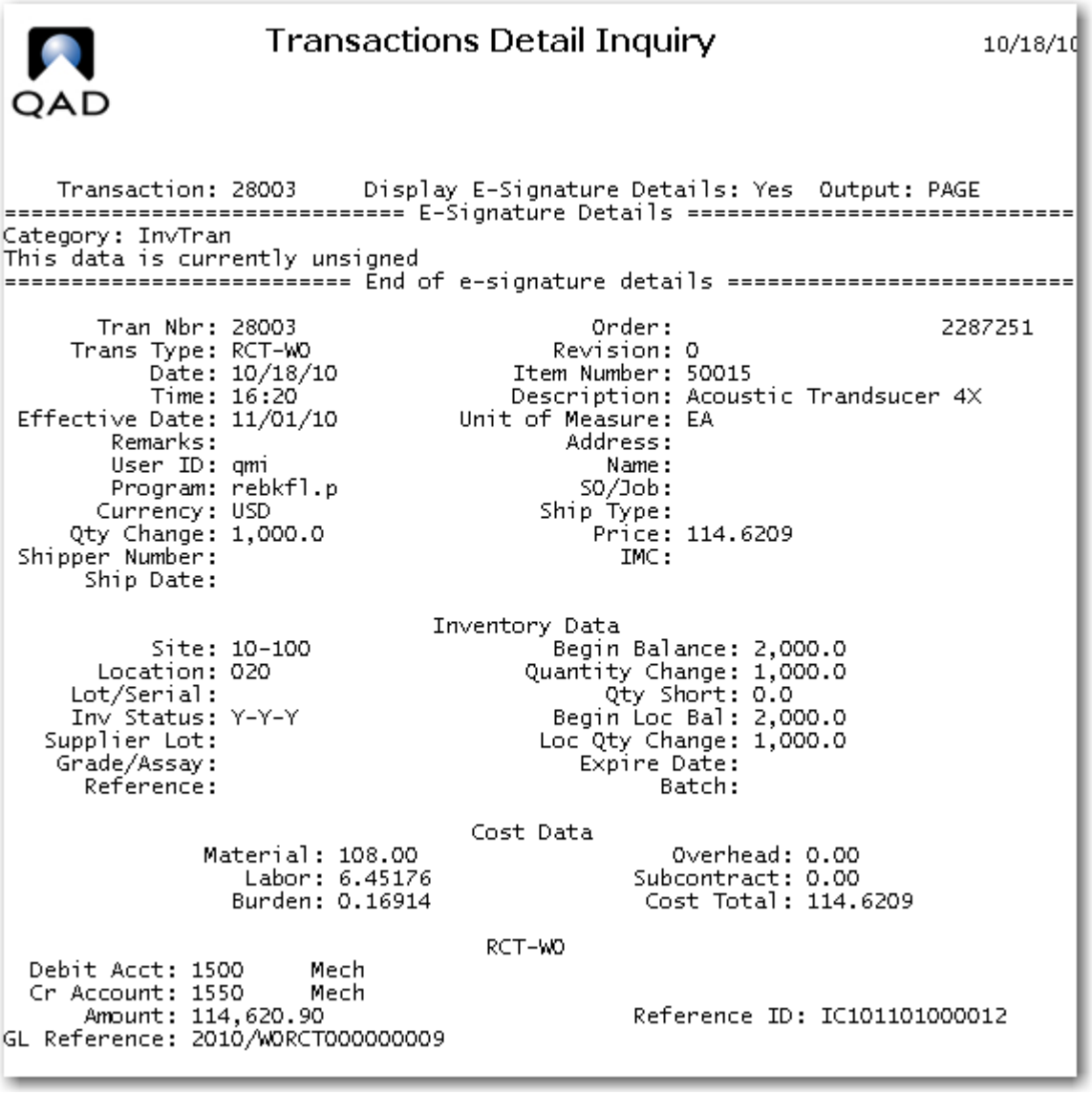
Op	Operation Description	Mile Stone	Input Queue	Quantity	Output Queue	Quantity	Reject Queue	Quantity
10	Assy. 1 electrode	no			Begin Qty	0.0	Begin Qty	0.0
					+Processed	1,005.0	+Rejected	0.0
					+Reworked	0.0	-Reworked	0.0
					-Rejected	0.0	-Scrapped	0.0
					-Moved Out	1,005.0	-Adjusted	0.0
					-Scrapped	0.0	Current Qty	0.0
					-Adjusted	0.0		
					Current Qty	0.0		

Op	Operation Description	Mile Stone	Input Queue	Quantity	Output Queue	Quantity	Reject Queue	Quantity
15	Assy 2nd electrode	no	Begin Qty	0.0	Begin Qty	0.0	Begin Qty	0.0
			+Moved In	1,005.0	+Processed	1,005.0	+Rejected	0.0
			-Processed	1,005.0	+Reworked	0.0	-Reworked	0.0
			Current Qty	0.0	-Rejected	0.0	-Scrapped	0.0
					-Moved Out	1,000.0	-Adjusted	0.0
					-Scrapped	5.0	Current Qty	0.0
					-Adjusted	0.0		
					Current Qty	0.0		

Operation 20 and 25 are completed as normal with 1000 each.

7 Use Inventory Detail by Item Browse (3.2) stating at 50015, you will see 3,000 in inventory. 2,000 from your first cumulative order, and 1,000 from the transaction just completed. Reporting production at the last operation with move next operation set to Yes, automatically puts the items into inventory.

8 Use Transaction Detail Inquiry (3.21.1) to see the receipt to inventory. Note the beginning balance of 2,000 units and the 1,000 moved in.



Transactions Detail Inquiry 10/18/10

```
    Transaction: 28003     Display E-Signature Details: Yes  Output: PAGE
============================== E-Signature Details ==============================
Category: InvTran
This data is currently unsigned
========================== End of e-signature details ==========================

       Tran Nbr: 28003                      Order:                      2287251
     Trans Type: RCT-WO                   Revision: 0
           Date: 10/18/10              Item Number: 50015
           Time: 16:20                 Description: Acoustic Trandsucer 4X
 Effective Date: 11/01/10          Unit of Measure: EA
        Remarks:                           Address:
        User ID: qmi                          Name:
        Program: rebkfl.p                  SO/Job:
       Currency: USD                    Ship Type:
     Qty Change: 1,000.0                    Price: 114.6209
 Shipper Number:                            IMC:
      Ship Date:

                                 Inventory Data
           Site: 10-100                Begin Balance: 2,000.0
       Location: 020                 Quantity Change: 1,000.0
     Lot/Serial:                           Qty Short: 0.0
     Inv Status: Y-Y-Y               Begin Loc Bal: 2,000.0
   Supplier Lot:                     Loc Qty Change: 1,000.0
    Grade/Assay:                        Expire Date:
      Reference:                              Batch:

                                   Cost Data
              Material: 108.00                  Overhead: 0.00
                 Labor: 6.45176              Subcontract: 0.00
               Burden: 0.16914               Cost Total: 114.6209

                                    RCT-WO
  Debit Acct: 1500     Mech
  Cr Account: 1550     Mech
      Amount: 114,620.90                    Reference ID: IC101101000012
GL Reference: 2010/WORCT000000009
```

You see the debit to Inventory 1500 and the credit to WIP 1550 for the GL cost of 1,000 of the 50015.

9 Close the Cumulative Order, Use (18.22.10) make the End Effective Date the last day of the next period. Leave the Update box Unchecked. Why? Review the report produced by the close transaction.

You now have a material variance caused by the scrap. A labor variance cause by the extra labor you charged and its corresponding labor burden variance.

QAD

Cumulative Order Close 10/18/10 1

10USA

S I M U L A T I O N

ID: 2287251
Site: 10-100 Ultrasound Mfg Site
Item Number: 50015 Acoustic Transducer 4X
Production Line:

Routing Code: 50015
BOM/Formula Code: 50015
Start Effective: 11/01/10
End Effective: 11/30/10
Order Quantity: 1,000.0
Status: Active

Component Material Usage Variance

Op	Cum Processed Qty	Item Number	Standard Qty Per	Qty Issued	Variance Qty	Cost	Cumulative Variance	Variance To Post
10	1,005.0	50011	1.0	1,005.0	0.0	110.335	0.00	0.00
		60012	1.0	1,005.0	0.0	1.000	0.00	0.00
15	1,005.0	60012	1.0	1,005.0	0.0	1.000	0.00	0.00
20	1,000.0	60012	1.0	1,000.0	0.0	1.000	0.00	0.00
25	1,000.0	60012	1.0	1,000.0	0.0	1.000	0.00	0.00
							0.00	0.00

WIP Material Scrap Usage Variance

Op	Cum Processed Qty	Yield%	Standard Yield Qty	Standard Scrap Qty	Cumulative Scrapped Qty	Variance Qty	Cost Total	Cumulative Variance	Variance To Post
10	1,005.0	100.0%	1,005.0	0.0	0.0	0.0	111.4109	0.00	0.00
15	1,005.0	100.0%	1,005.0	0.0	5.0	5.0	112.4809	562.40	562.40
20	1,000.0	100.0%	1,000.0	0.0	0.0	0.0	113.5509	0.00	0.00
25	1,000.0	100.0%	1,000.0	0.0	0.0	0.0	114.6209	0.00	0.00
								562.40	562.40

Run Labor Usage Variance

Op	Cum Processed Qty	Std Run Time	Std Labor Hours	Actual Labor Hours	Variance Hours	Labor Rate	Cumulative Variance	Variance To Post
10	1,005.0	0.01	10.05	10.05	0.0	5.00	0.00	0.00
15	1,005.0	0.01	10.05	11.05	1.0	5.00	5.00	5.00
20	1,000.0	0.01	10.0	10.0	0.0	5.00	0.00	0.00
25	1,000.0	0.01	10.0	10.0	0.0	5.00	0.00	0.00
							5.00	5.00

Run Labor Burden Usage Variance

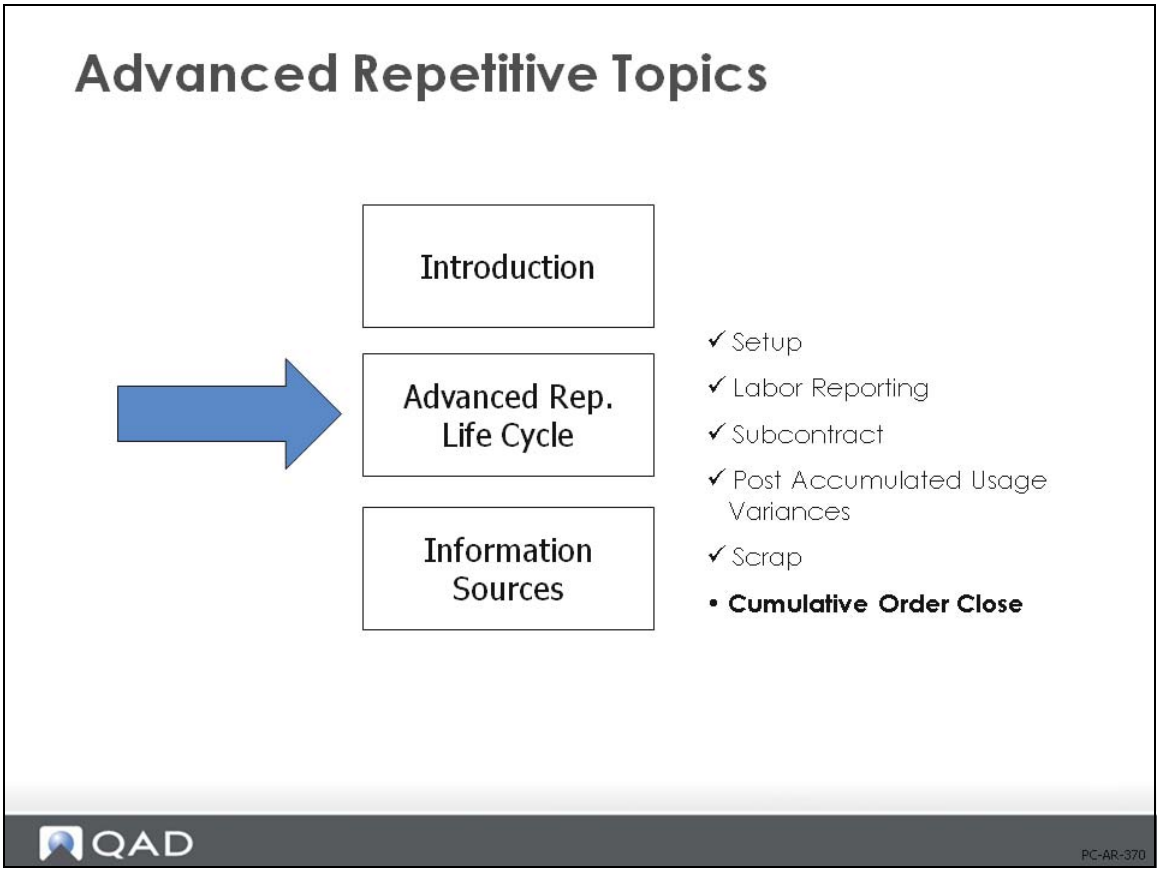
Op	Cum Processed Qty	Std Run Time	Std Labor Hours	Actual Labor Hours	Variance Hours	Burden Rate	Cumulative Variance	Variance To Post
10	1,005.0	0.01	10.05	10.05	0.0	2.00	0.00	0.00
15	1,005.0	0.01	10.05	11.05	1.0	2.00	2.00	2.00
20	1,000.0	0.01	10.0	10.0	0.0	2.00	0.00	0.00

Because the Update box was unchecked, the report is labeled Simulation. This allows you to review the results before actually posting them. Run the function again with the Update box checked.

At the end of the Repetitive Operations Accounting Report you will see the labor and burden variances and the accounts that were booked, note the type codes RLUV, Repetitive Labor Usage Variance and RBUV Repetitive Burden Usage Variance.

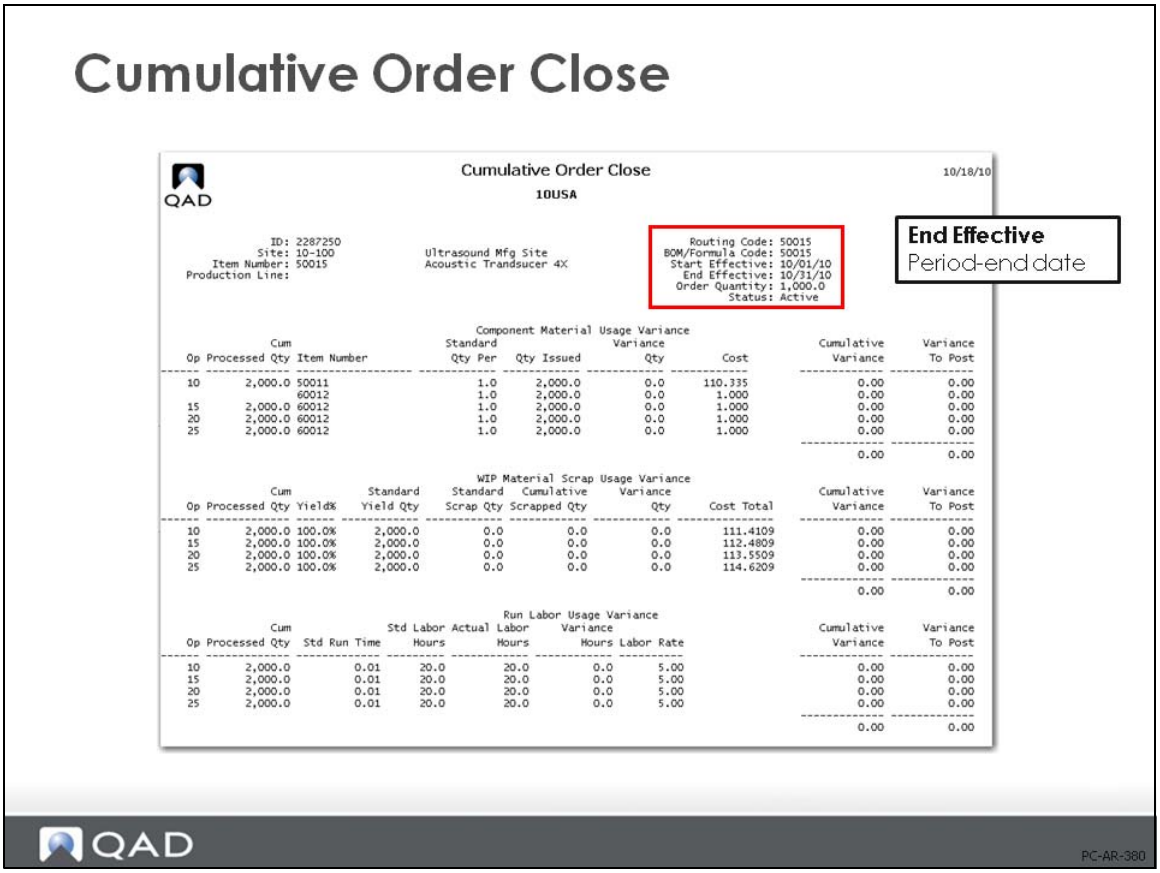
11/30/10	2568		15	2010/SYS-DB000000216	5140	Mech	mfg	5.00
				WO101130000002 RLUV	1550	Mech		
		50015	2287251	Acoustic Transducer 4X				
11/30/10	2569		15	2010/SYS-DB000000217	5240	Mech	mfg	2.00
				WO101130000003 RBUV	1550	Mech		

Cumulative Order Close



Cumulative Orders must be closed for accounting purposes in order to clear out WIP. Normally the Cumulative Order Close (18.22.10) is run as part of your period-end procedures. It creates the same GL transactions as the Work Order Accounting Close (16.21).

Closing the Cumulative Order



The one difference is that Cumulative Order Close will close all cumulative work orders regardless of whether they have been “completed” or not. This completes any unreported operations, but it closes them at zero cost. If all components have been issued at the first operation, or if you have not completed all production in each operation, you could incur significant variances.

Cumulative Order Close (18.22.10) also creates GL entries for usage and method variances accumulated since the previous Post Accumulated Usage Variances report.

- Cumulative Order Close has update and no update options
- Orders with blank End Effective dates are not selected by Cumulative Order Close
- You can transfer WIP balances to another cumulative order or write off balances to Method Change Variance

  If Transfer WIP is set to Yes, then any amount on the old cumulative order is transferred to the new cumulative order through the Transfer Clearing account. Any difference between the old cumulative order WIP and the new cumulative order WIP will create a method change variance.

  If Transfer WIP is set to No, then any amount on the old cumulative order is cleared through the method change variance account

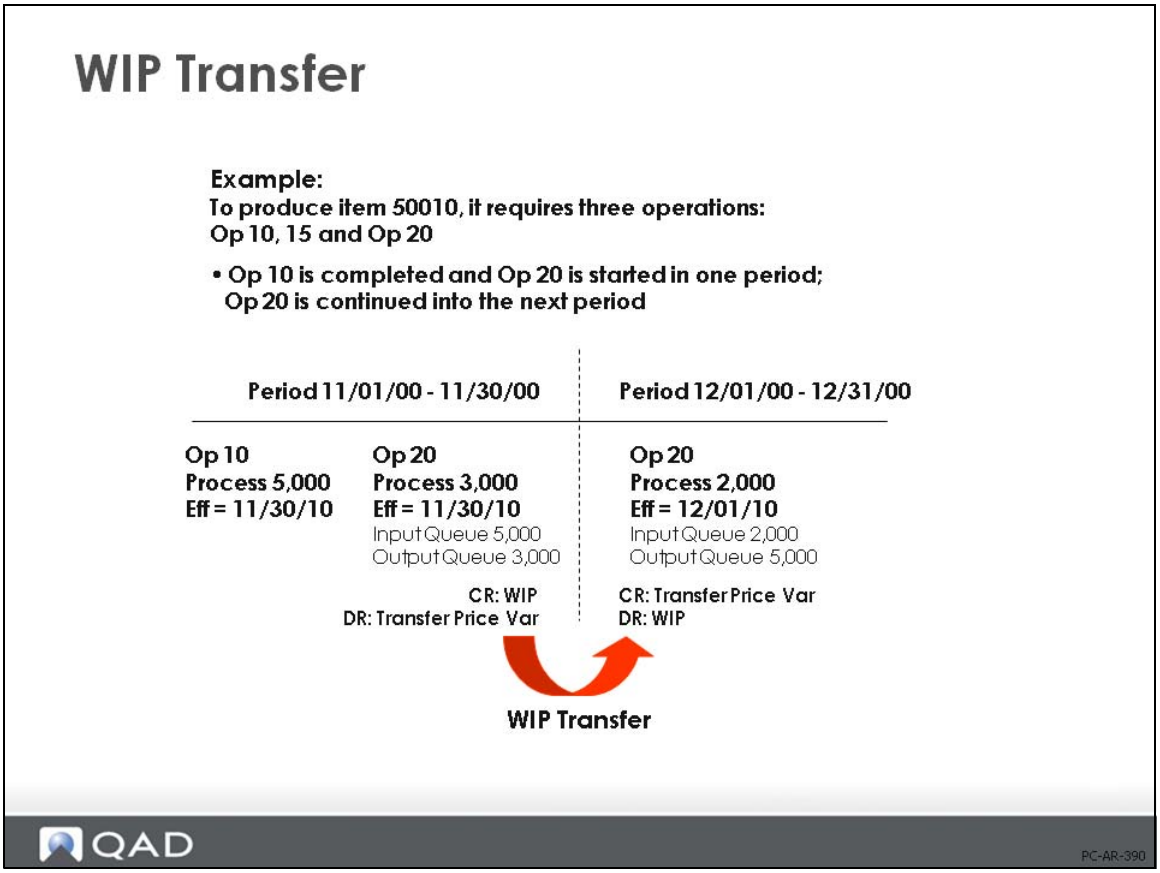
Note Cumulative orders will be closed if their End Effective date matches the End Effective date on the request screen, whether they have been completed or not. If you report completions at intermediate (that is, non-receiving) milestone operations, this should not cause variances if you set Transfer WIP to yes.

Processing Sequence

The processing sequence for each order selected by Cumulative Order Close is:

- Execute Post Accumulated Usage Variances
- Set cumulative order status to [C]losed
- Create CLOSE operation history record
- Transfer WIP, if necessary
- If WIP transferred, create TRANSFER operation history
- Post any remaining balance in WIP to Method variance

WIP Transfer



If Transfer WIP is Yes in Cumulative Order Close (18.22.10), the system transfers WIP balances to the next appropriate cumulative order—an order with the same item number, site, and production line.

- The system adds the WIP queue quantities from the order being closed to the WIP Input Queue balance quantities of the receiving order. Depending on quantities completed at each operation, the transfer could be to the same operation in the new order or to the next operation.
- The system reinstates the WIP value by debiting the new cumulative order WIP account and crediting the old cumulative order WIP Transfer account specified in Advanced Repetitive Control (18.22.24)
- If the cost of WIP queue inventory at this operation is different than the cost of the receiving operation, the system calculates and records the difference to Method Change Variance

WIP Transfer Inhibitors

Some factors prevent a WIP transfer from taking place, necessitating manual adjustments:

- A cumulative order already exists in the next period, but is *closed*
- An operation with the *same* number as the transferring operation does not exist on next period's cumulative order
- An operation number match between both cumulative orders is found, but the transferring operation is *not* the first operation whereas the operation on the new order is the first operation

WIP Transfer on the Cum Order Close Report

Transfer WIP

				WIP Transferred To Clearing		
Op	Input Queue Qty	Prev Op Cost Total	Output Queue Qty	Reject Queue Qty	Cost Total	Amount
40	100.0	49.25	0.0	0.0	58.25	4,925.00
						-3,178.50 TOTAL

Close: The system reports value of WIP queue inventory to WIP transfer acct

Transfer: The system reinstates WIP value by debiting new cum order WIP account and crediting old cum order transfer account

WIP Transfer on the Cum Order Close Report: New Period

			WIP Transferred To New Order 2287249				
Op	Input Queue Qty	Prev Op Cost Total	Output Queue Qty	Reject Queue Qty	Cost Total	Method Change Variance	Amount
10			0.0	0.0	24.07	0.00	0.00
20	0.0	24.07	0.0	0.0	25.14	0.00	0.00
30	-205.0	25.14	0.0	3.0	27.21	-3,031.43	-5,072.07
40	100.0	27.21	0.0	0.0	29.28	2,204.00	2,721.00
						-827.43	-2,351.07

The new order carries the WIP value from the previous period.

System knows this is a continuation of an order from one period to another because the order in the new period has the same item number, site and production line.

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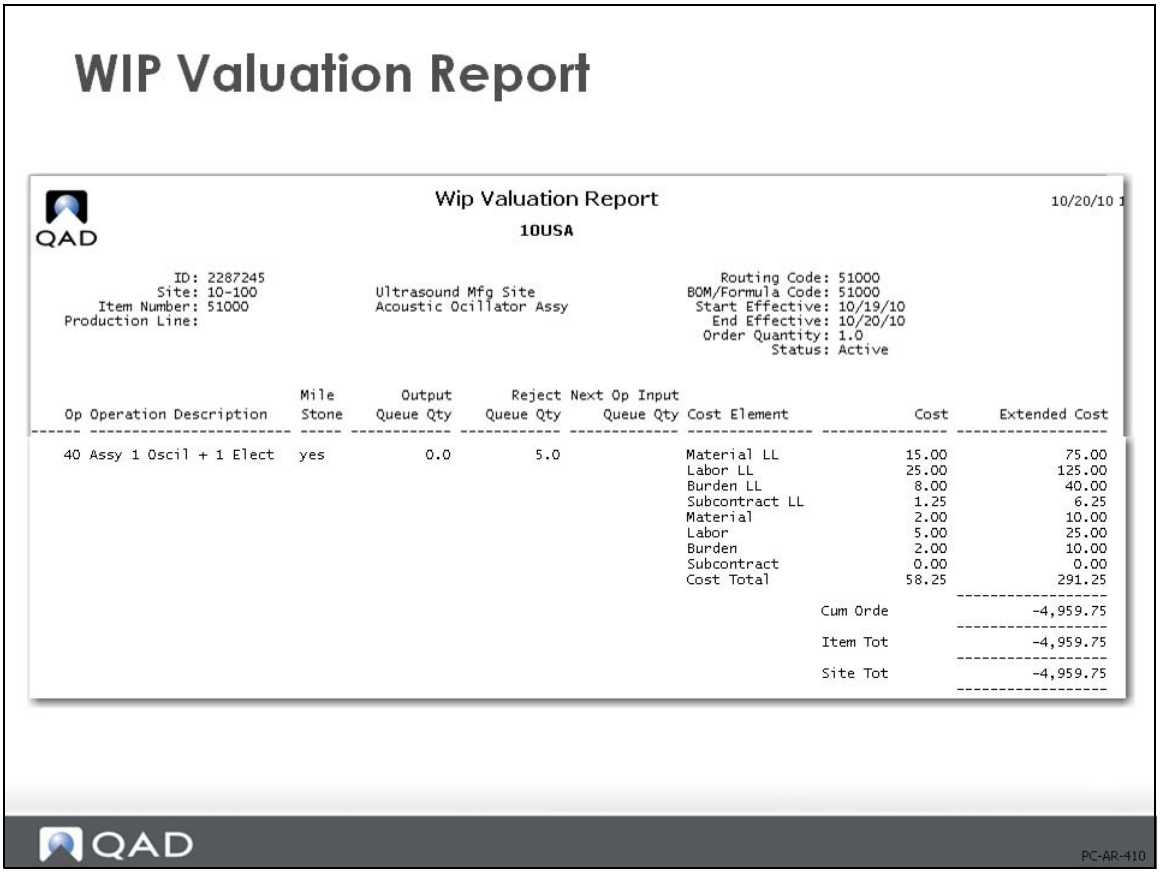
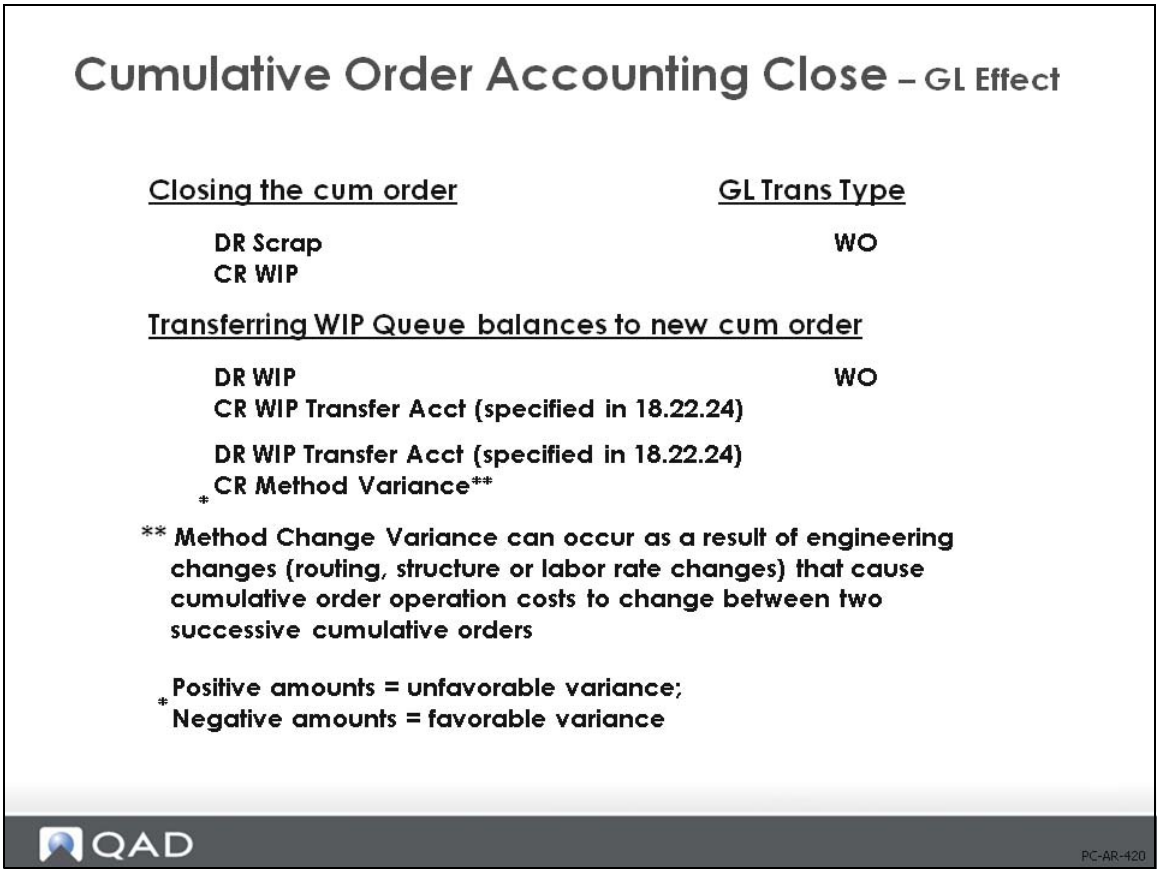
WIP Transfer on the WIP Valuation Report

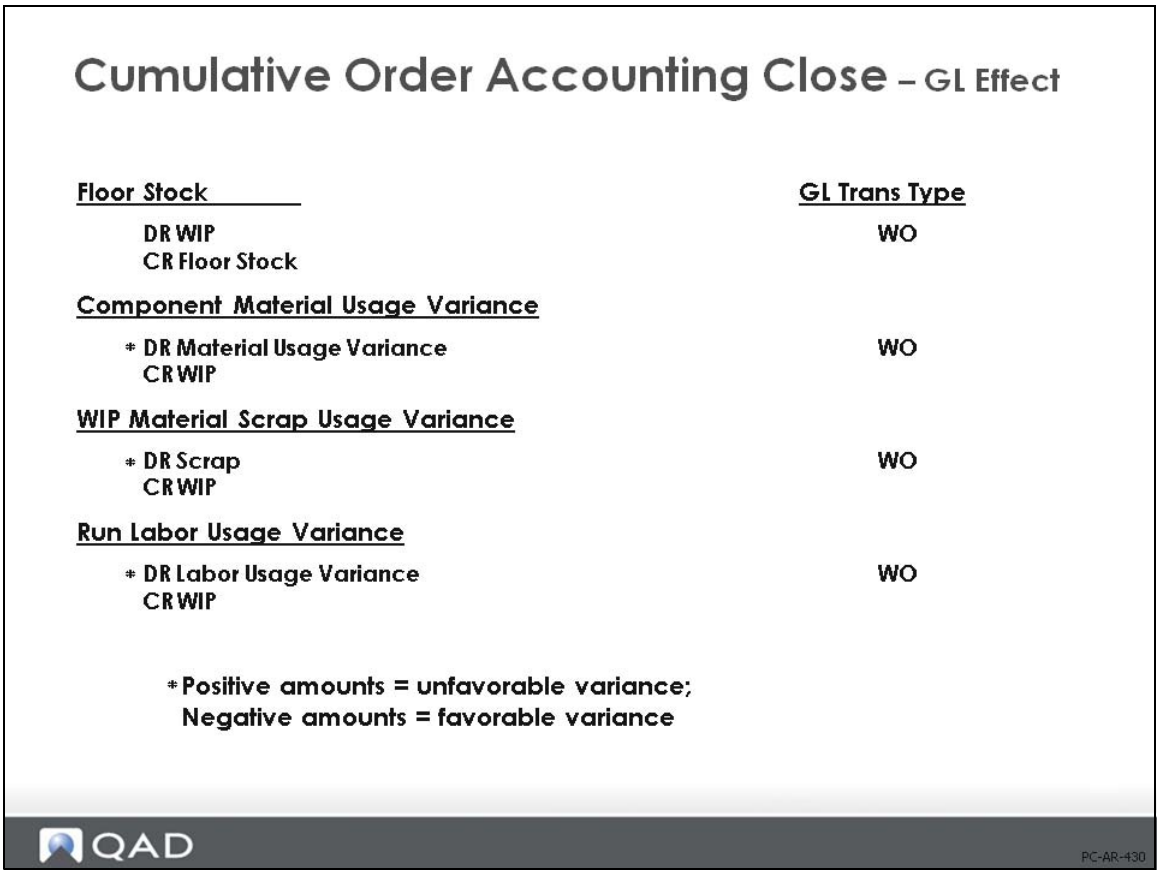


One of the more important reports in the Advanced Repetitive module is the WIP Valuation Report (18.22.4.13). This is used to report the current value of WIP, detailed by item, site, and production line. It shows the status of all open production orders, WIP quantity, rejects, and the value of WIP.

Cumulative Order Close: GL Effect



The GL effects of Cumulative Order Close are shown above and on the following pages.



The GL effects for the variances (shown above and on the following page) are the same as those produced by Post Accumulated Usage Variances (18.22.9)

Cumulative Order Accounting Close – GL Effect

Run Labor Burden Usage Variance	GL Trans Type
DR Burden Usage Variance	WO
CR WIP	
Set-up Labor Usage Variance	
* DR Labor Usage Variance	WO
CR WIP	
Set-up Labor Burden Usage Variance	
* DR Burden Usage Variance	WO
CR WIP	
Subcontract Usage Variance	
* DR Subcontract Usage Variance	WO
CR WIP	

* Positive amounts = unfavorable variance;
  Negative amounts = favorable variance

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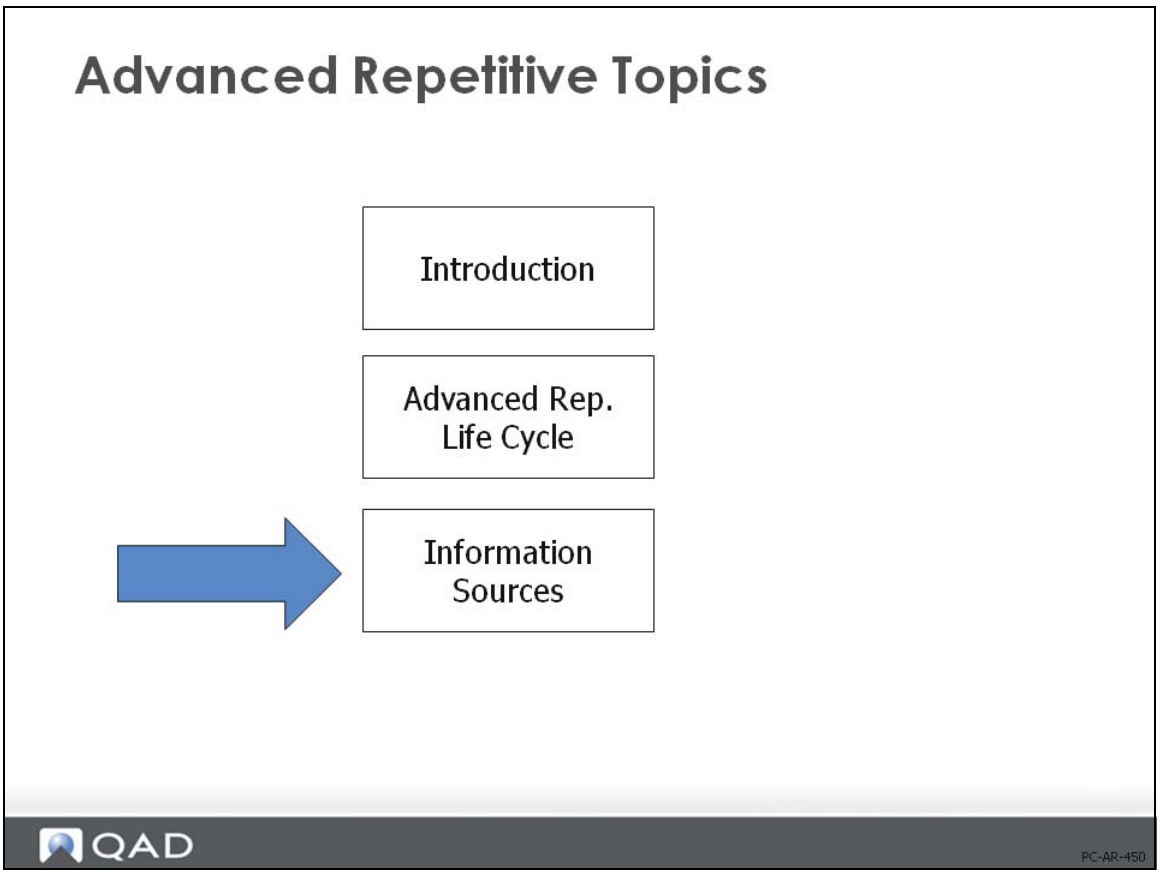
Cumulative Order Close



Information sources that are particularly relevant to Advanced Repetitive transactions and costing are noted on the following pages.

WIP Valuation Report (18.22.4.13)

Reports the value of the WIP queues at the operation cost contained in the selected cumulative orders. This report should be run at month-end and reconciled to the GL WIP account.

WIP Status Inquiry (18.22.12)

Displays quantities in the input, output, and reject queues for an operation.

WIP Status Report (18.22.4.11)

Generates a report for WIP queue quantities for all operations in selected cumulative orders. The report also shows the cumulative activities affecting each of the queue quantities, such as cumulative completed, scrapped, adjusted, rejected, reworked and moved to next operation. Any negative queue balances indicate errors and these should be reviewed and corrected prior to month-end.

Operation Transaction Detail Inquiry (18.22.4.2)

List detailed audit information about a specific labor feedback transaction; includes the quantity, time, and cost.

Operation Transaction Detail Inquiry (18.22.4.2)

Displays all data relating to costing captured in the cumulative order when it is created. It reports by operation the product structure and component costs, labor hours per operation, labor cost per hour, burden factors, yield factor, and subcontract cost.

Repetitive Operations Accounting Report (18.22.4.9)

Prints a summary of the GL transactions generated by Repetitive Labor Feedback activities.

Transactions Detail Inquiry (3.21.1)

Lists detailed audit information about a specific repetitive issue or receipt transaction; includes inventory transaction information as well as all of the GL debits and credits.

Transactions Accounting Report (3.21.16)

Prints the GL transactions generated by one or more inventory transactions.

Unposted Transaction Inquiry (25.13.13)

Lists GL transactions that have been created but not yet posted.

Appendix A

Variances and Components Reference

Purchase-Related Variances

Variance	Calculation Method
Purchase Price Calculated at: PO Receipts (5.13.1) Reports: Transaction Receipts Report (5.9.14) Transactions Detail Inquiry (3.21.1)	[PO Unit Cost – (GL Unit Cost – OH)] * PO Qty Received
AP Rate Calculated at: Supplier Invoice Create (28.1.1.1) Reports: Matching Variance Report (28.2.7) Transactions Detail Inquiry (3.21.1)	(Invoice Unit Cost – PO Unit Cost) * Invoice Qty
AP Usage Calculated at: Supplier Invoice Create (28.1.1.1) Reports: Matching Variance Report (28.2.7) Transactions Detail Inquiry (3.21.1)	(Invoice Qty – PO Receipt Qty) * PO Unit Cost

Manufacturing-Related Variances

Variance	Calculation Method
Material Rate Calculated at: WO Component Issue (16.10) WO Receipt Backflush (16.12) Repetitive Backflush (18.22.13) Reports: Work Order Cost Report (16.3.4) Transactions Detail Inquiry (3.21.1)	(WO BOM Unit Cost at Issue – GL Unit Cost) * Actual Qty Issued
Material Usage Calculated at: WO Accounting Close (16.21) Cumulative Order Close (18.22.10) Post Accumulated Usage Variances (18.22.9) Reports: Work Order Cost Report (16.3.4) Transactions Detail Inquiry (3.21.1) Rep Operations Accounting Report (18.22.4.9)	{Actual Qty Issued – [qty per * (qty completed + qty rejected)]} * GL Unit Cost
Labor Rate Calculated at: SFC Feedback (16.20.1), (16.20.2), (16.20.3) Can be deferred until: WO Receipt (16.11), (16.12) Repetitive Backflush (18.22.13) Reports: Work Order Cost Report (16.3.4) Operations Accounting Report (16.20.13.10) Rep Operations Accounting Report (18.22.4.9)	Per Operation: [(Actual Setup Rate – Std Setup Rate) * Actual Setup Hrs] + [(Actual Run Rate – Std Run Rate) * Actual Run Hrs] Setup and run rates are equal to the payroll rate (defined in 14.13.21) or the work center rate if payroll is not set up. No variances if no labor reporting
Labor Usage Calculated at: SFC Feedback (16.20.1), (16.20.2), (16.20.3) Can be deferred until: WO Receipt (16.11), (16.12) Post Accumulated Usage Variances (18.22.9) Cumulative Accounting Close (18.22.10) Reports: WO Cost Report (16.3.4) Operations Accounting Report (16.20.13.10) Rep Operations Accounting Report (18.22.4.9)	Per Operation: [(Actual Setup Hrs – Std Setup Hrs) * Std Setup Rate] + [(Actual Run Hrs – Std Run Hrs) * Std Run Rate] Std Run Hrs = Std Run Hrs * (Qty Completed + Qty Rejected)

Variance	Calculation Method
Burden Rate Calculated at: SFC Feedback (16.20.1), (16.20.2), (16.20.3) WO Receipt (16.11), (16.12) Repetitive Backflush (18.22.13) Reports: WO Cost Report (16.3.4) Operations Accounting Report (16.20.13.10) Rep Operations Accounting Report (18.22.4.9)	Per Operation: [(Actual Setup Bdn – Std Setup Bdn) * Actual Setup Hrs] + [(Actual Run Bdn – Std Run Bdn) * Actual Run Hrs] Actual Setup Bdn = (Actual Setup Rate * Lbr Bdn%) + Lbr Bdn Rate + (Mach Bdn Rate * Mach/Op) Std Setup Bdn = (Std Setup Rate * Lbr Bdn%) + Lbr Bdn Rate + (Mach Bdn Rate * Mach/Op) Actual Run Bdn = (Actual Run Rate * Lbr Bdn%) + Lbr Bdn Rate + Mach Bdn Rate Std Run Bdn = (Std Run Rate * Lbr Bdn%) + Lbr Bdn Rate + Mach Bdn Rate
Burden Usage Calculated at: SFC Feedback (16.20.1), (16.20.2), (16.20.3) Can be deferred until: WO Receipt (16.11), (16.12) Post Accumulated Usage Variance (18.22.9) Cumulative Order Close (18.22.10) Reports: WO Cost Report (16.3.4) Operations Accounting Report (16.20.13.10) Rep Operations Accounting Report (18.22.4.9)	Per Operation: [(Act Setup Hrs – Std Setup Hrs) * Std Setup Bdn] + [(Act Run Hrs – Std Run Hrs) * Std Run Bdn] Std Setup Bdn = (Std Setup Rate * Lbr Bdn%) + Lbr Bdn Rate + (Mach Bdn Rate * Mach/Op) Std Run Bdn = (Std Run Rate * Lbr Bdn%) + Lbr Bdn Rate + Mach Bdn Rate
Subcontract Rate Calculated at: PO Receipt (5.13.1)	(Subcontract PO Unit Cost – Subcontract Unit Cost from Routing) * Qty Received
Subcontract Usage Calculated at: WO Accounting Close (16.21) Post Accumulated Usage Variance (18.22.9) Cumulative Order Close (18.22.10)	[Qty Received – (Op Qty Completed + Op Qty Rejected)] * Subcontract Unit Cost from Routing
Method Calculated at: WO Accounting Close (16.21) Cumulative Accounting Close (18.22.10)	Balance of WO/ID value remaining
Mix (Co/By-Products) Calculated at: WO Accounting Close (16.21)	[Order Qty – (Receipt Qty + Scrap Qty)] * GL Unit Cost

Variances by Transaction Flow

Variances by Transaction Flow
PO Receipts Purchase Price Variance *[PO Unit Cost – (GL Unit Cost – OH)] * PO Qty Received* Subcontract Rate Variance *(Subcontract PO Unit Cost – Subcontract Unit Cost from Routing) * Qty Received* **Receiver Matching** Accounts Payable Rate Variance *(Invoice Unit Cost – PO Unit Cost) * Invoice Quantity* Accounts Payable Usage Variance *(Invoice Qty – PO Receipt Qty) * PO Unit Cost* **Work Order Component Issue** Material Rate Variance *(WO BOM Unit Cost at Issue – GL Unit Cost) * Actual Qty Issued* **Labor Feedback** Labor Rate Variance *[(Actual Setup Rate – Std Setup Rate) * Actual Setup Hrs] + [(Actual Run Rate – Std Run Rate) * Actual Run Hrs]* Labor Usage Variance *[(Actual Setup Hrs – Std Setup Hrs) * Std Setup Rate] + [(Actual Run Hrs – *Std Run Hrs) * Std Run Rate]* **Std Run Hrs = Std Run Hrs * (Qty Completed + Qty Rejected)* Burden Rate Variance *[(Actual Setup Bdn – Std Setup Bdn) * Actual Setup Hrs] +* *[(Actual Run Bdn – Std Run Bdn) * Actual Run Hrs]* Burden Usage Variance *[(Act Setup Hrs – Std Setup Hrs) * Setup Bdn] + [(Act Run Hrs – Std Run Hrs) * Run Bdn]* **Work Order Accounting Close** Subcontract Usage Variance *[Qty Received – (Op Qty Completed + Op Qty Rejected)] * Subcontract Unit Cost from Routing* Material Usage Variance *{Actual Qty Issued – [qty per * (qty completed + qty rejected)]} * GL Unit Cost* Method Variance

Components of Item Cost

Components of Item Cost	
Material	
Dependent On	*Defined In*
Material/Purchase Price	Item Master Maintenance (1.4.1), (1.4.9), (1.4.18)
Quantity Per	Product Structure Maintenance (13.5), (15.5)
Scrap %	Product Structure Maintenance (13.5), (15.5)
Phantom	Item Master Maintenance (1.4.1), (1.4.7), (1.4.17)
Pur/Mfg	Item Master Maintenance (1.4.1), (1.4.7), (1.4.17)
Structure Type	Product Structure Maintenance (13.5)
Yield %	Routing Maintenance (14.13.1)
Labor	
Dependent On	*Defined In*
Work Center Labor Rates	Work Center Maintenance (14.5)
Work Center Setup Rates	Work Center Maintenance (14.5)
Run Time per Unit	Routing Maintenance (14.13.1), (14.13.2)
Setup Time per Lot	Routing Maintenance (14.13.1), (14.13.2)
Order Quantity	Item Master Maintenance (1.4.1)
Subcontract Cost	Routing Maintenance (14.13.1)
Burden	
Dependent On	*Defined In*
Work Center Labor Burden Rates	Work Center Maintenance (14.5)
Work Center Labor Burden Percent	Work Center Maintenance (14.5)
Work Center Machine Burden Rate	Work Center Maintenance (14.5)
Machines/Operation	Work Center Maintenance (14.5)
All of the items under Labor (above)	