Infor XA – Enterprise Product Data Management Concepts Guide

To the reader

This book contains the information you need to understand this application. The information in this book applies only to XA. For a complete list of the books in the XA library, see the bibliography included on the XA documentation CD.

- Chapter 1 "Enterprise Product Data Management" introduces the application and its features.
- Chapter 2 "Installation Considerations" explains what happens when you migrate your data from PDM.
- Chapter 3 "Sites and Facilities" introduces the Sites object and explains both production and simulation sites as well as facilities.
- Chapter 4 "Items, Routings, and Bills of Material" explains how items, routings, and bills make up an item process.
- Chapter 5 "Engineering Changes" explains how engineering records can be maintained and copied from site to site.
- Chapter 6 "Costing" explains product costing and costing simulations for EPDM.
- Chapter 7 "Offline EPDM" describes file maintenance and the CAD interface on the System i.
- Three appendices explain EPDM offline file load, costing calculations, and application settings. A fourth appendix identifies XA applications that now use EPDM functions and lists EPDM legacy options that have been moved to Power-Link.

Before you begin

Complete the following training if you do not have equivalent knowledge:

- Education on how to use a Windows application.

What this book contains

This book contains information about the design of Enterprise Product Data Management.

Summary of changes

The following changes have been made to the EPDM application:

Kits and Kit Component structures

EPDM now allows the creation and maintenance of kits and kit component structures through the bill of material function. In an environment with EPDM installed, kit components will not be maintainable in the Customer Order Management (COM) application.

Price Book unit of measure

Item revisions are used in pricing unit of measure functions and in price books for base price, quantity price break amount and percent, and discount markup amount and percent.

Migration to XA Release 9

Prior to migrating to XA Release 9, a Pre-Upgrade Audit routine is available to screen the attributes in the Item Revisions object. This audit will identify attribute values that are not valid or consistent in the existing Item Revisions data and suggest corrective actions.

During migration to XA Release 9, an ATM program will generate a new Item Site record for every item and site with at least one item revision. The program will use values in the corresponding current item revision for default attribute values in the Item Site record.

See the Infor ERP XA R9 EPDM Pre-Upgrade Audit Instructions document (Informational PTF SH85696) for more information.

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Chapter 1: Enterprise Product Data Management

Introduction

Welcome to Enterprise Product Data Management (EPDM). XA EPDM is an engineering application for both single site and multi-site organizations. EPDM organizes, maintains, and presents the product engineering data to a manufacturing organization. This data includes information about inventory items, such as raw materials, purchase parts, subassemblies, and assemblies, in structural parent/component relationships. EPDM provides for multiple:

- Enterprise Items

- Sites

- Item revisions

- Costing simulations

- Bills of material

- Routings

- Item processes

- Facilities and accounting classes

- Implementation Statuses

EPDM allows you to copy records from an enterprise-wide item master file to multiple sites. An *enterprise item* helps you define an item across sites consistently. Whenever you create an item that is already in Enterprise Items, you receive a warning message that the item already exists. This helps to ensure that an item is defined only once within the enterprise of site-item-revision records.

With EPDM you can define one or more production *sites*, used for manufacturing, and one or more simulation sites which are used for planning purposes only.

For each site, there can be multiple *revisions of an item* that are based on costing, engineering or other differences. By creating revisions for an item, you can differentiate an item through different phases of design and production. Both inventory items and non-inventory items are referred to as item revisions.

Costing simulations let you perform "what-if" analyses for selected sites and item revisions. You can override various cost factors and see the results of those changes in the costing simulation results.
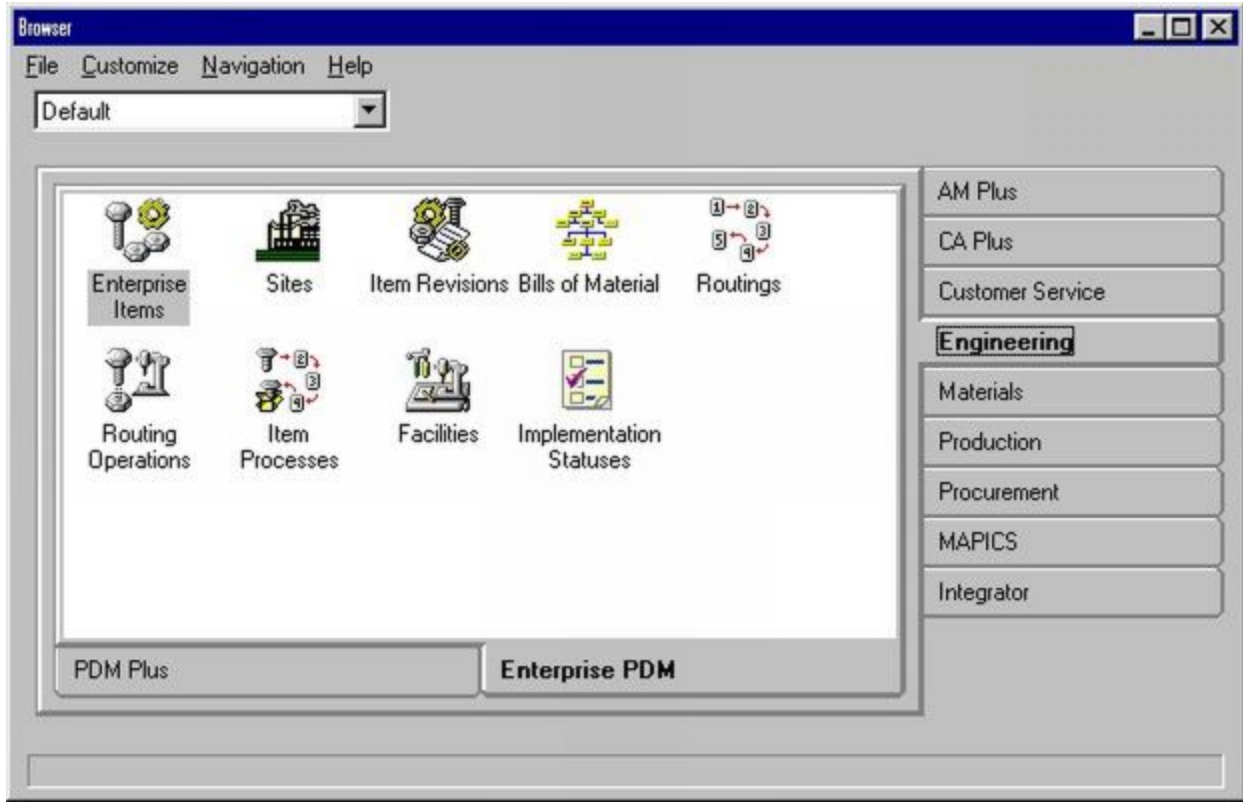
There can also be multiple *bills of material* (BoMs) for each parent item. In a BoM, a parent item is composed of one or more component items and one or more levels of *components.* Because each item can have different bills of material, you can define bills that reflect the various interests of the engineer using the bill. For example, a design engineer can create a bill of material for an item that reflects the designer's point of view, while a manufacturing engineer might restructure the bill to more closely fit the manufacturing facilities and available components that produce the product.

Routings are defined as the sequence of operations or processes required to make an item. The routing must identify facilities, and it can have run machine, run labor, setup labor, and outside *operations* associated with it.

An *item process* is used to uniquely define an item revision. It can be associated with a BoM and a routing version, within a site. An item must have at least one primary process and can have many alternate processes.

A *facility* is a machine or group of machines with similar characteristics used to perform a manufacturing process, such as an assembly area or milling machine center. *Accounting cla*sses can be defined for use with facilities.

An item master record goes through many phases in the design, production, and manufacturing cycle. *Implementation statuses* store information on where an item is in this cycle. The information is defined as status codes with additional switch settings. These status codes can then be entered in the item record so that interfacing applications can determine how a particular item should be handled.
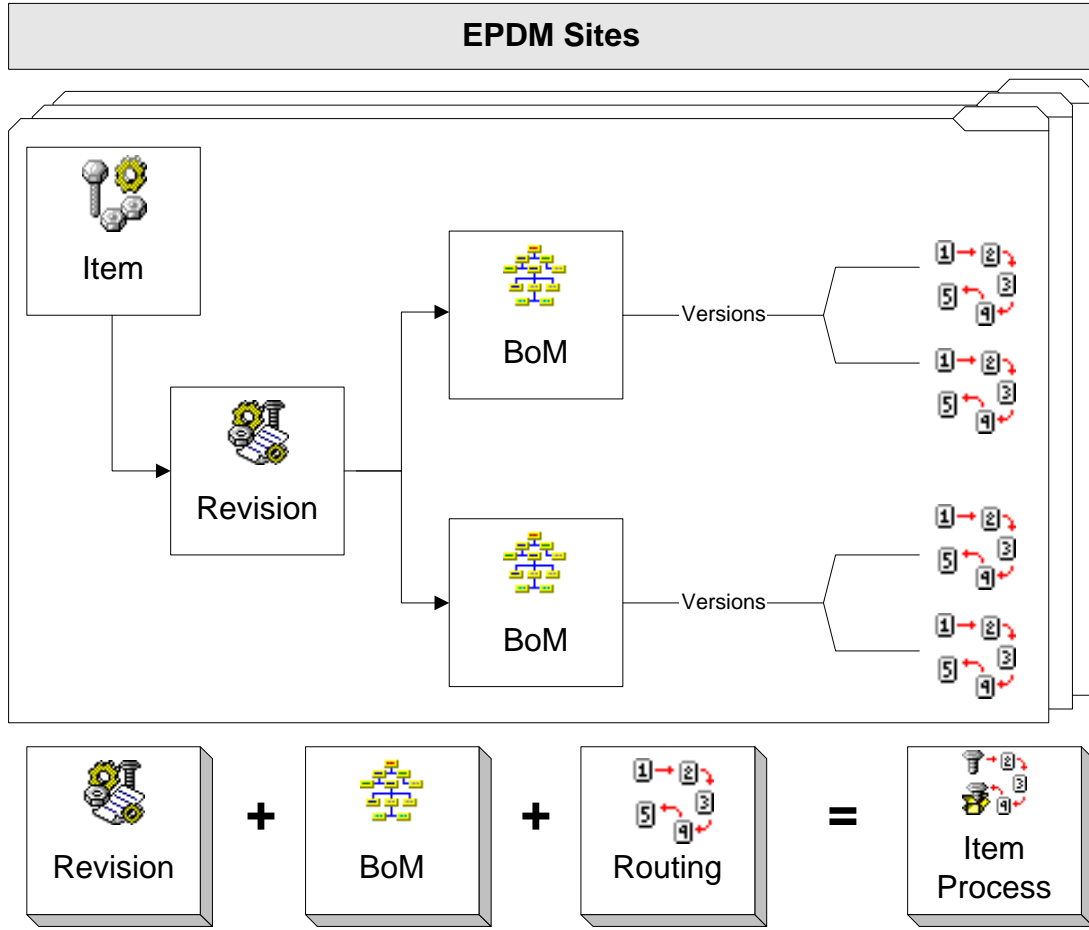
EPDM item processes

Engineering records that include item revisions, bills of material, and routings can be defined, maintained, and costed for each site. Item processes link a bill of material with a routing for a specific item revision. An item must have at least one primary process and can have many alternate processes. An item process, primary or alternate, is differentiated by an effective date range. Primary process effective dates cannot overlap each other, but alternate process effective dates can. If you have only one primary process, it has no end date. When you create a second primary process, the first ends when the second begins.

Only primary item processes are used in product costing, master schedule planning, and material requirements planning. Alternate processes can be used to override a primary process at the time of order entry or during the release of a planned order. You can also use alternate processes to provide different routings through the manufacturing process or to allow for different materials to be used in an alternate bill of material.

Copying engineering records

EPDM manages and costs engineering records by site in a multi-site organization. You can copy engineering records from site to site and you can use site definitions to create your own costing scenarios. This copy function can save entry time when sites have the same item records. You might create records at a design engineering site, copy them to a manufacturing engineering site, and finally copy them to a production site.

EPDM has three powerful utilities you can use to copy engineering records between sites:

- Item Revision Copy of an item, single-level bill of material, or routing

- Item Revision Mass Indented Copy of an indented bill with all associated items, routings, and facilities

- Site Copy of all engineering records in one site to another site

The Item Revision Copy option is usually used to copy an item within a site. The Item Revision Mass copy is often used to copy engineering records from one site to another site.

Comparing engineering records

EPDM uses the Infor XA client architecture that allows you to take a close look at engineering records. You can compare differences between two enterprise items, item revisions, bills, routings, facilities, or processes by record or by field within a record. You can quickly see and interpret differences in:

- Cost from one item to another

- Bills or routings from one item to another

- Item processes from one item to another

Receiving engineering records

Although you can create engineering records interactively in EPDM, you can also load existing engineering records to the EPDM information base through EPDM Offline functions on the System i.

EPDM receives engineering records from:

- PDM during migration

- CAD or other systems

- Offline file maintenance

EPDM receives engineering records in these formats:

- CAD systems format

- Infor XA Release 7 formats

- User-defined formats

See "Chapter 2: Installation Considerations" on page 18 and "Chapter 7: Offline EPDM" on page 81 for more information. File record layouts are explained in Chapter 7.

Migration from PDM to EPDM

In EPDM, the process of upgrading from Product Data Management (PDM) to EPDM is called "migration." During migration, EPDM receives engineering records from PDM. PDM is not a required application for EPDM; however, even if PDM is not installed, some of the Infor XA applications, such as CRP and COM,

still use the Item Master file from the PDM database, because they have not been EPDM-enabled yet. When EPDM is active, every application function that is enabled to use EPDM checks the site field in the warehouse record to determine which engineering record to use. A warehouse must have a site entry if EPDM is active.

When EPDM is installed in a system where PDM has previously been installed and active, information in the item, bill of material, routing and production facility files in PDM must be migrated to the EPDM Enterprise Items, Item Revisions, BoMs, Routings, Facilities, and Item Processes objects. PDM data can be migrated multiple times. However, once EPDM is activated, the PDM files can no longer be migrated or maintained. The migrated items in the Item Revisions object are now considered released items. From this point on, whenever these migrated/released items are maintained in EPDM, the updates are also made to the PDM Item Master files.

When a user creates a new item revision in EPDM, it must be released in order to be included in the PDM Item Master and therefore available to applications that are not EPDM enabled. The released items will have their records in the Item Master A, B, and C files updated with additions and changes from the item revision A, B, and C files.

When PDM data is migrated to EPDM, it is restructured with new key fields. All engineering records are organized by site. In EPDM, the Item Master file is called Item Revision and has three key fields: site, item, and revision. The migration process assigns a blank revision to the PDM records. Bills of materials, routings and facilities are also organized by the site field.

EPDM requires that you define a production site that is used for migrating from a PDM information base. The default site that serves as the link between PDM and EPDM must be a production site. This default site is used to bring any existing PDM engineering records into EPDM.

From Migration to Item Release

1. Migrate PDM engineering records.

2. Verify that the migration was successful.

3. Activate the EPDM interface. **Note**: At this point, the PDM application can no longer be used. The PDM files remain on the system, but with exception of the Item Master file, are no longer used or updated. The PDM application is de-installed. The items that were migrated are now in released status. Also at this point, the PDM records can no longer be migrated again.

4. When migration process is completed and new items are created in EPDM, they have to be manually released so that non EPDM enabled applications can have access to the item revision information via the information stored in the Item Master file.

Defining sites

When you create an EPDM site, you can choose to define either a production or a simulation site. Once a site is designated as a simulation site or a production site, you cannot change the designation. However you can copy a site to another site and make the second site the other type.

The simulation site is used only within EPDM; you cannot manage inventory or orders in a simulation site. Use simulation sites as temporary work areas to analyze planned engineering changes and predict and manage costs. You can copy engineering records from a production site into a simulation site and change cost-sensitive information, then roll up costs to see the results. Once the results are complete for a simulation site, you can delete the site or copy it to a production site.

You can use site definitions to group engineering records into your own categories, such as a group of engineering records for design engineering and another group for manufacturing engineering. Engineers can use site definitions to create new products or to convert a bill of material used in the design of a product to a bill of material used for manufacturing that product. After the manufacturing bill of material is final, it can be copied back to the production site with a change in the revision level to differentiate it from earlier items and bills.

In a multi-site environment, warehouses are linked to a single site. However, multiple warehouses can use the same items and their revisions, BoMs, routings, operations, and facilities.

The Sites object keeps track of when the last cost generations, full or simulated were performed. EPDM tracks four dates for product costing.

- Standard Full

- Current Full

- Standard Simulated

- Current Simulated

Use CAS to set up security for each site. You can give each user the authority to view or maintain information for that site. See the *Cross Application Support User Guide* for more information on setting up security.

Defining facilities

You define facilities that can in turn be used to identify where operations are performed when you create routings. Each facility belongs to a site and it can be a work center, workstation, or a production line. A facility is where work is performed to produce an item.

See "Chapter 3: Sites and Facilities" on page 23 for more information.

Defining items and revisions

An item revision is a unique combination of a site, an item, and a revision. Each revision has an effective date range and can be costed separately. An item revision can have a bill of material, a routing, or both. A revision, in effect, extends the Item Master record to let you define appropriate manufacturing processes and run costs by site, item, and revision.

The Item Revisions object manages the references to Item Master for interfacing applications. Item Revisions updates Item Master attributes to use the corresponding Item Revisions attributes. The items in Item Revisions can have different revisions. Each revision has an *effective from* and *effective to* date range. Since a revision is part of the site item key, you can develop product costs by revision within a site. Infor XA Supply Chain Management (SCM) / Thru-Put, Advanced Planner (AVP), Master Production

Schedule Planning (MPSP) and Material Requirements Planning (MRP) plan orders by revision based on an order's start date, the warehouse that is being planned, and the site the warehouse is assigned to.

In a multi-site environment, the Enterprise Items object permits multiple sites to copy item definitions into Item Revision records belonging to a specific site. When you create an item for the first time, you also add the item number to Enterprise Items. The user can copy the item description from Enterprise Items to the item being created at a different site. A user can give the item a unique revision, but it is not required.

Items also have an implementation status value that identifies them for:

- Release to engineering

- Release to manufacturing

- Maintain configured bill of material

- Maintain configured routing

- Three user defined status codes

Use the Implementation Status object to define statuses for individual item revisions or for a group of items related to a project. After you define the statuses, you can add them to your item definition by using the Item Revisions object. You control the status through the business procedures that you set up within your company. See "Chapter 4: Items, Routings, and Bills" on page 30 for more information.

Defining routings and versions

Item 1 can have a unique or a generic routing

Routing 1 Version 1   Item 1   Routing Y

Items can have a unique routing that has the same ID as the item or a generic routing that it shares with other items in the production environment. EPDM lets you define routings for each site that reflect differences in the way an item is manufactured. You can create both unique routings, and generic or shared routings with different versions. .

Within the same site, version numbers are used to show alternate routings for the same item. Usually one routing version defines the standard way of producing an item while other routing versions define alternate ways. You can use EPDM routing definitions to define:

- Alternate ways to manufacture an item to avoid a facility bottleneck

- Temporary or estimated routings before final routings are available

- Future changes to a process to streamline and speed up operations with new tools

You can also create generic routings when the operation steps are the same for many items and the operation time is identical or the time difference is insignificant. A generic routing defines a set of operations that are common to one or more items. Use generic routings to reap these benefits:

- You only have to define the routing once for a site.

- Any changes to the routing can be done once and automatically update for all items that uses the shared routing. Maintenance to a routing is significantly reduced if many items use the same routing.

- You can assign the routing to different item revision records by creating item process records.

- You can create a generic routing whose ID does not match with any existing Item Revision.

Since you can have many routing versions, each version has a header record that describes the version and also keeps track of cumulative yield information. This information can be used to calculate the adjusted quantity per value for a bill of material paired with the routing version by an item process. The Item Processes object keeps track of the specific item revision-routing bill of material combinations for each site.

The Routing Operations object contains records for operations in a routing. Associated with each Routing Operation is the Routing Description, which provides a longer description of the operations. See "Chapter 4: Items, Routings, and Bills" on page 30 for more information.

Defining bills of materials

When you define a bill of material, you are defining the components of a product. Each component that is part of the bill of material is tied to the item revision for the parent item. An item revision can have many bills of material. Each bill of material, like each routing, has a header record that describes the bill and associates the components of the bill with a standard batch quantity.

More than one bill of material for an item is useful in various circumstances. For example, when a bill is used with different routings, it might be necessary to accurately portray the operations where components are used. Your organization might also routinely keep track of different types of bills: as designed, as manufactured, as built. Sometimes at order release you find that a primary component is in short supply, so you want to go to the backup material you usually substitute in this situation. You can release the order with the alternate bill that includes the substitute, and thus avoid having to delete the original component and add the substitute when it comes time to process the order in Inventory Management's Manufacturing Order Detail Maintenance.

Costed inquiries for assemblies are available using multi-level indented bills of material.

Defining item processes
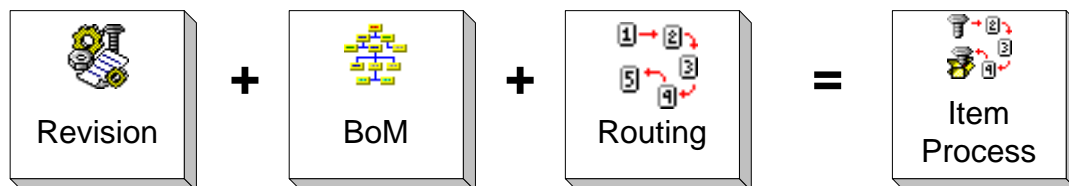
Because an item revision can have more than one bill of material and routing, EPDM uses the Item Processes object to store the combinations of bills and routings for a specific item revision record over a period of time. One primary process is always defined. You can define more primary processes, but they cannot have an overlapping effective date with other primary processes. This primary process serves as the default process that is selected for use in planning, creating, and releasing a manufacturing order. The primary process is selected based on the start date of an order and the item revision in effect on the order's start date.

You can also use alternate processes for different purposes. The effective dates for alternate processes can overlap.

Each item process is identified by:

- Site

- Item

- Revision

- Alternate bill of material ID

- Routing ID

- Routing version

You can define an item process with no bill of material or routing. Some purchased items may not have a bill or routing while others may have only a receiving routing.

All Infor XA applications that interface with EPDM use the primary process for planning purposes. Alternate processes are used as overrides when necessary during order entry and release. Item processes are used by these application functions:

- EPDM product costing runs

- Supply Chain Management (SCM)/Thru-Put planning and order review/release

- Advanced Planner (AVP) planning and order review/release

- Master Production Schedule Planning (MPSP) planning

- Material Requirements Planning (MRP) planning and order review / release

- Order-Based Production Management (OBPM) order review/release

- Inventory Management (IM) manufacturing order entry and release

- PCC order entry and routing release

Standard features

Infor XA client architecture offers standard functions, including:

- Maintenance History

- Reason Tracking

- Attachments

- Navigation Bookmarks

- Workbench

- Client API string

- System-Link

For detailed information on Infor XA client standard functions, see *the Infor XA Browser Concepts Guide.*

Comparing engineering records

EPDM uses site, enterprise item, item revision, and item process to distinguish engineering records. EPDM gives you a tool for seeing these differences quickly. When you use the **Compare** function, you can compare only the data entry fields or all fields including system-generated and updated fields.

Comparing records has two stages. First you can compare two bills and see the differences in components: one has component A, the other doesn't. Then you can compare common components and see differences field by field.

Use the EPDM comparison of engineering records to answer questions like these:

- What is the difference between this bill of material and another?

- How does this routing version differ from another?

- What is the difference between these two item processes?

The compare function contrasts data fields within records. For example, one item might cost $100.00 and a very similar item revision, $120.00. You can perform an inquiry that compares the two item revisions and find out what cost elements are different and by how much. Then you can compare the item processes to see if there are differences in the bills or routings.

Controlling how items are processed

EPDM lets you control what can and cannot be done with an item. Use the Implementation Statuses object to define status codes that mark an item as ready or not ready for release to engineering and release to manufacturing. When an item has a status of ready for release to engineering, the item has completed the design phase and can be released to PDM and become an available engineering record for other applications. When an item has a status of ready for release to manufacturing, manufacturing orders can be released to the factory from IM & MRP

Use Implementation Statuses to define a record with a unique Implementation ID and switch settings. This ID can then be inserted in an item revision record to control when the item is released to engineering and manufacturing. You can control how groups of items are processed in a project by giving each item the same implementation ID. You can then change the switch setting in the Implementation record to move all the items through the release to engineering and then manufacturing. Similarly you can control if an item configuration or routing configuration can be maintained.

Costing items

With EPDM you can generate product costs by site. You can do full or selected product costing runs. Since you can generate costs by item revision, you can evaluate the cost of producing an item at one site versus another or one item revision versus another. Note that costing cannot be done by item process; only the primary item process is costed.

PDM and EPDM costing differ in these ways:

- EPDM costs by item revision, by site, or all item revisions, while PDM costs only by item or all items.

- EPDM can run product costing for either a production site or a simulation site.

- EPDM can define and save "what-if" data in costing simulations.

- EPDM automatically calculates yield and adjusted quantity per whenever a change is made through the routing file while you must select a PDM menu option to calculate these two values.

See "Chapter 6: Costing" on page 60 for more information.

Printing reports

EPDM has a Host Printing option available from the **File** menu and the **Where-Used** sub menus for some objects. This illustration shows the Item Revisions Report Options with the Operations Cost Sheet selected. The report criteria in the right-hand panel changes with each report you select.

To display this dialog select the **File** menu and the **Host Print** command.
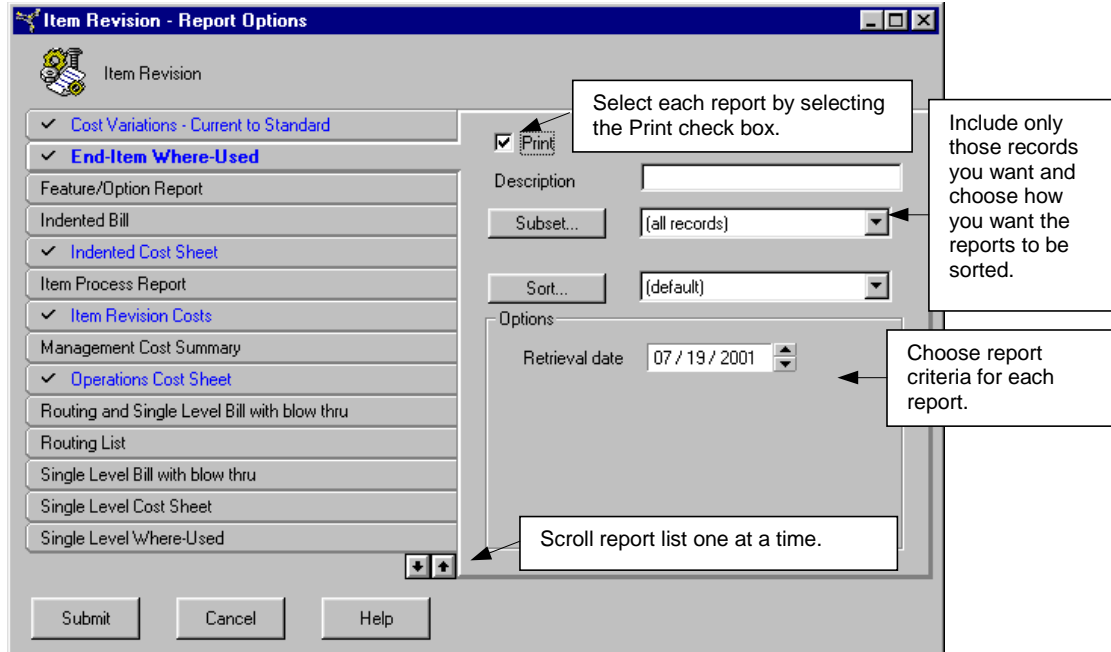
This dialog illustrates selected reports that are submitted in one job to the System i when you click **Submit**. Use the CAS Printer Override Maintenance function to send the report to a selected printer.

The following table lists those EPDM objects whose List or Where-Used windows have a File menu with the Host Print command. Sites and Enterprise Items do not have Host Print commands.

EPDM Object	List Window	Where-Used Window
Facilities	Yes	No
Routings	Yes	Yes
Implementation Statuses	No	Yes
Item Revisions	Yes	No
Item Processes	Yes	No
Bills of Material	Yes	Yes

Release to engineering

When EPDM is installed and activated, EPDM maintains all changes to the Item Master file. This ensures that there is only one source of maintenance to an engineering record.

EPDM uses the Item Release file to track the items that have been released. During PDM migration to EPDM, the Item Release file is created and updated with each PDM item moved to EPDM.

After the initial time an item is released, an item can be released interactively, or by using the Mass Item Release option. When EPDM Item Revisions change, EPDM automatically checks Item Release to see whether the item is released. If it has been released, EPDM sends the changes to update the Item Master through offline maintenance.

Engineering release technique

When a new item revision is created in EPDM with an implementation status of **Release**, it can be released to Item Master. Release works in these steps:

1. EPDM compares the Item Revision and Item Master records.

2. EPDM creates transactions to make the Item Master record look like the Item Revision record. These include **Add** and **Change** transactions for fields that can be keyed but not for system generated fields.

Releasing engineering records to other sites

EPDM allows you to release engineering records in different phases of the design and manufacturing process to other sites by copying them. This release differs from the release to engineering since the Item Release file is not created or updated. Instead EPDM uses the compare function to create *difference* transactions that are used to update the target site.

Planning, creating, and closing manufacturing orders

Planning manufacturing orders

All the Infor XA planning applications (SCM, AVP, MPSP and MRP) determine the appropriate engineering records to use for building an item, by finding the primary item process in effect on the planned order start date.

- First, the system finds the Item Revision effective on the planned start date. When multiple item revisions are effective on a date, the system uses the one with the latest effective from date.

- Then the system finds the Primary Item Process for that item revision effective on that date. It identifies the selected item process in the planned manufacturing order record.

- The bill of material and routing from the selected item process are used to plan the component materials and resources required to build the item.

Creating and releasing manufacturing orders

If you are using one of the Infor XA planning applications (SCM, AVP, MPSP, and MRP), you can review, create, and release the planned manufacturing orders in either:

- Order-Based Production Management (OBPM), by using the MRP Recommendations object (which supports all the orders planned by SCM, AVP and MRP).

- MRP, by using the menu options to Review/Approve Items and Release Orders (which also support all the orders planned by SCM, AVP and MRP).

In either case, you can release the order as planned or override the plan, where required, by selecting an alternate process for an order as you release it.

If you do not use an Infor XA planning application, you can create and release manufacturing orders in either:

- Order-Based Production Management (OBPM), using the Customer Demand object, which displays customer orders to be filled, the Reorder Recommendations object, which "plans" replenishment for order point items, the Create Manufacturing Order, which lets you create an order at your discretion.

- Inventory Management (IM) and Production Control and Costing (PCC), using the IM Order Entry and Order Release menu options, and as required, the PCC (Routing) Entry and Release menu options, which let you create an order at your discretion.

In either case, you can release the order using the default primary item process, selected just as the planning applications do, based on the current date (the default order start date), or override the default

where required, by selecting an alternate process for an order as you create it. If no item processes are available, you can enter a bill and routing as you create the order.

EPDM's engineering records are recognized and retrieved by any of the above Infor XA applications. All items used in a manufacturing order must have been released to engineering so that applications not enabled to EPDM can still function.

Closing manufacturing orders

Manufacturing orders can be selected for closeout in Order-Based Production Management (OBPM), Inventory Management (IM) or Production Control and Costing (PCC), and actually closed out and copied to Manufacturing Order history in IM or PCC.

When orders are closed out, average yield and efficiency statistics are updated in the EPDM facilities and routing operations files.

EPDM direct interface to other applications

EPDM can communicate directly with these applications:

Application	Interfacing Application activities	EPDM activities
PDM Product Data Management	Provides engineering records during migration. Receives engineering item data through engineering release and from EPDM maintenance for the Item Master file.	Receives engineering records during migration from PDM. Receives engineering records from CAD system and offline maintenance. Maintains all engineering records once activated.
APC Cameleon Advanced Product Configurator	Receives item revision data for configurable products and their components. Builds product configurations per customer requirements, and sends product configurations to EPDM	Sends item revision data for configurable products and their components. Receives product configurations per customer requirements, and makes them available to MRP for planning and OBPM for execution.
OBPM Order-Based Production Management	Uses item revisions, item processes, bills of material, routings, facilities, and cost information to create and release manufacturing orders planned by SCM, AVP and MRP, or for order point items.	Provides item revisions, item processes, bills of material, routings, facilities, and cost information for manufacturing orders.
IM Inventory Management	Uses item revisions, item processes, bills of material, and cost information to create and release manufacturing orders. Updates yield and efficiency statistics in routings and facilities at order close.	Provides item revisions, item processes, bills of material, and cost information for manufacturing orders
PCC Production Control and Costing	Uses item process, routings, facilities, and cost information for manufacturing order routings. Updates yield and efficiency statistics in routings and facilities at order close.	Provides item process, routings, facilities, and cost information for manufacturing order routings.
REP Repetitive Production Scheduling	Uses item revisions, item processes, bills of material, routings, facilities, and cost information for production schedules.	Provides item revisions, item processes, bills of material, routings, facilities, and cost information for production schedules.

Application	Interfacing Application activities	EPDM activities
SCM Supply Chain Management / Thru-Put	Uses item revisions, item processes, bills of material, routing, facilities, and cost information to plan and schedule manufacturing orders.	Provides item revisions, item processes, bills of material, routing, facilities and cost information.
AVP Advanced Planner	Uses item revisions, item processes, bills of material, routing, facilities, and cost information to plan manufacturing orders.	Provides item revisions, item processes, bills of material, routing, facilities and cost information.
MPSP Master Production Schedule Planning	Uses item revisions, item processes, bills of material, routing, facilities, and cost information to plan manufacturing orders for master scheduled items.	Provides item revisions, item processes, bills of material, routing, facilities and cost information.
MRP Material Requirements Planning	Uses item revisions, item processes, bills of material, and cost information to plan & create and release manufacturing orders.	Provides item revisions, item processes, bills of material, item processes and cost information
PM Procurement Management	Uses routing and facility information.	Provides routing and facilities for purchase items.
PUR Purchasing	Uses routing and facility information.	Provides routing and facilities for purchase items.
CSM Customer Service Management	Uses product structure detail for customer order entry of feature/option items.	Provides product structure detail for feature/option items.
COM Customer Order Management	Uses product structure detail for customer order entry of feature/option items.	Provides product structure detail for feature/option items.
EQM Estimating and Quote Management	Provides the EQM engineering records to EPDM.	Receives engineering records through offline maintenance.
PMC Production Monitoring and Control	Uses facility cost rates to calculate labor and overhead costs.	Provides facility cost information for production orders.

EPDM File Relationships

SITMST Site
Groups engineering records within a warehouse. Item revision, facility, BoM, & routing records are all entered by site. A site can be either a production or simulation site.

WHSMST Warehouse
Contains information about the entities where inventory is stored and managed. A site can have more than one warehouse.

FACMST Facility
Where an item is made. A group of machines that are used to perform a process, such as a work center, production line, or work station.

ITMRVC **ITMRVB** **ITMRVA** Item Revision
Stores the site, item, and revision information that uniquely identifies each item, along with routings, bills of material, and effective date ranges.

ITMREL Item Release
Tracks items that have been released to engineering.

ITMPRC Item Process
An item revision plus a routing, a bill of material, or both, including effective dates. Item processes can be primary or alternate.

ITMENT Enterprise Item
List of items used by all sites. Prevents unwanted duplication and provides consistent item definitions across sites.

ITEMASC **ITEMASB** **ITEMASA** Item Master
This file is updated automatically when the item revision file is updated. The Item Master file matches the Item Revision file.

RTGHDR Routing
Lists the facilities used and describes the order in which operations are performed to produce an item. Alternate routings within a site use different version numbers.

PSTHDR Bill of Material
The components of a product. Each component is tied to the item revision for the parent item. An Item Revision can have multiple BoMs.

ITMPLN Item Balance
Tracks current quantities for a selected item across all warehouses.

RTGOPR Routing Operation
Contains detailed routing information, such as operation number, operation description, and production facility.

PSTDTL Bill of Material Detail
Contains product structure detail information.

RTGODS Routing Operation Description
Contains additional routing operation descriptions.

The diagram above shows the file relationships that support EPDM. The EPDM object that is used to maintain the file is indicated by its application icon that appears in the main Browser window. Refer to this diagram for a quick reference to the EPDM files and how they function.

Maintaining user-defined fields

EPDM gives you user-defined fields in all master files that you can use to communicate with your current systems. The fields are easily maintained in EPDM. For example, in the Implementation Status object, you will find three fields you can use with programs you have written to create status codes that can be attached to item records.

Records that are brought over from an existing PDM information base do not lose the user-defined fields you have created in the record. These fields are preserved during the migration. Unlike PDM, all EPDM user-defined fields are maintainable. Every master file is also time-stamped with a creation date and time and a last updated date and time. The time stamps also record the user ID for the user who created or updated the record.

Chapter 2: Installation Considerations

Introduction

When you install EPDM, you must:

- Create a default site

- Identify the default site EPDM Application Settings,

- Activate the EPDM interface.

Installing and tailoring EPDM

EPDM installs seamlessly with all existing XA applications and environments. When EPDM is installed and activated, EPDM drives all file maintenance for items, routings, item processes, and bills of material. All those applications that do not yet communicate directly with EPDM for item information use the Item Master files that EPDM updates.

Refer to the *Planning and Installing Guide* and the *Cross Application Support User's Guide* for more information about how to install and tailor XA applications.

During the tailoring of applications you select option **6 Install/Tailor applications** from the CAS main menu. The product is in dedicated mode so that you can select applications and answer questions to tailor your applications and environment.

Creating the default site

After EPDM is installed, use the Create option in the Sites object to define a production site to be used as the default site. Whether you have an existing PDM information base or not, you must create a production site. You then designate this site as the default in EPDM Application Settings.

Migrating PDM engineering records to EPDM

When you add EPDM to an existing PDM environment, you can transfer the existing PDM information base to EPDM. Follow these steps:

1. From the Site list card, select **File** and then **Host Jobs**.

2. Select **Migrate engineering data**.

3. From the list of attributes, select **Execute**. This choice leaves the PDM environment active.

       OR

   Select both **Execute** and **Activate EPDM Interface**. This choice migrates records, turns on the interface, and inactivates PDM.

You can migrate PDM records but leave PDM active while you become familiar with EPDM. During a training phase, you can introduce EPDM and experiment with using it. When you are ready to go to EPDM for file maintenance, you can repeat the migration but select **Activate EPDM Interface**. You can migrate your PDM engineering records more than once until the time that you select migrate and activate.

What happens during migration?

During migration, all the PDM file information is reformatted for the corresponding EPDM file.

Migration includes:

- Item Master

- Bill of material structure

- Facility

- Routing

Item Master

This diagram shows the first of three phases in the Item Master migration.
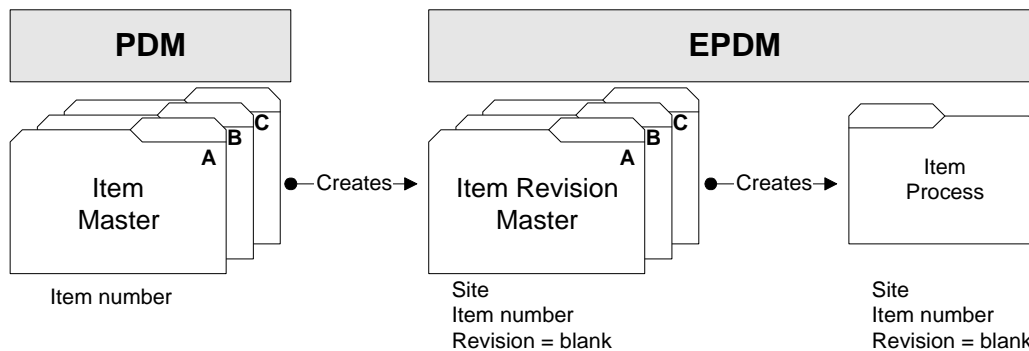
When migration is started, all of PDM's engineering records are reformatted in EPDM files. This diagram shows how the PDM Item Master file with the key field of Item Number is migrated to a new EPDM Item Revision Master file. The migration results in two new key fields added in EPDM: the default site identifier set up in the control file and a blank revision field. The migration also creates an enterprise-wide item master record that includes attributes of the low level code and an item description, and a primary item process record that will identify the bill of material and/or routing defined for the item.

In the second phase, each item that is migrated from PDM is checked for a bill of material, a routing, or both. The next diagram shows how the migration processes the PDM engineering record in each of these cases. The key fields are indicated by a **bold** format.

PDM	EPDM		
If the item has a Bill of Material... —Updates→	**Item Process** ●—Creates▶	**Bill of Material** *header*	
	Site **Item Number** **Revision = blank** **Alternate BoM = blank** BoM Site = Site BoM Item = Item Number BoM Rev = blank	**Site** **Parent Item Number** **Revision = blank** **Alternate BoM = blank** Description Number of Single Level Components Standard Batch Quantity Cumulative Feature/Option Cost	
If the item has a Routing —Updates→	**Item Process** ●—Creates▶	**Routing** *header*	
	Site **Item Number** **Revision = blank** **Alternate BoM = blank** Routing ID = Item ID Version = blank Effectivity Dates	**Site** **Routing ID = Item ID** **Version = blank** Description Number of Routing Operations Number of Additional Descriptions Standard Cumulative Yield Current Cumulative Yield Average Cumulative Yield	
If the item has a Bill of Material *and* a Routing... —Updates→	**Item Process** ●—Creates▶	**Routing** *header* ●—Creates▶	**Bill of Material** *header*
	Site **Item Number** **Revision = blank** **Alternate BoM = blank** Routing ID = Item ID Version = blank BoM Site = Site BoM Item = Item Number BoM Rev = blank	**Site** **Routing ID = Item ID** **Version = blank** Description Number of Routing Operations Number of Additional Descriptions Standard Cumulative Yield Current Cumulative Yield Average Cumulative Yield	**Site** **Parent Item Number** **Revision = blank** **Alternate BoM = blank** Description Number of Single Level Components Standard Batch Quantity Cumulative Feature/Option Cost

When an item has a bill of material, the migration updates an Item Process record with fields that EPDM can update and use. A product structure header record is also created with information from the Item Master including the parent item number, standard batch quantity and cumulative feature/option cost factor.

When an item also has a routing, the migration updates the Item Process record placing the routing identifier in the record and also creates a Routing Header file with a blank version field and other information from the PDM routing file.

When an item has only a routing and no bill of material, the migration updates the Item Process and Routing Header records with the pertinent information

Finally, the migration from PDM creates an Item Release file with the default site identified in the EPDM Control file, an item number, and blank revision.

Bill of material

This diagram shows the bill of material migration that is done at the same time that the bill of material header file is created.

PDM	EPDM	
Bill of Material	**BoM** *header*	**BoM** *detail*
●—Creates→	●—Creates→	
Parent Item	Site	Site
User Sequence 1	Parent Item Number	Parent Item Number
Component Item	Alternate BoM = blank	Alternate BoM = blank
User Sequence 2		User Sequence 1
		Component Item
		Component Revision = blank
		User Sequence 2
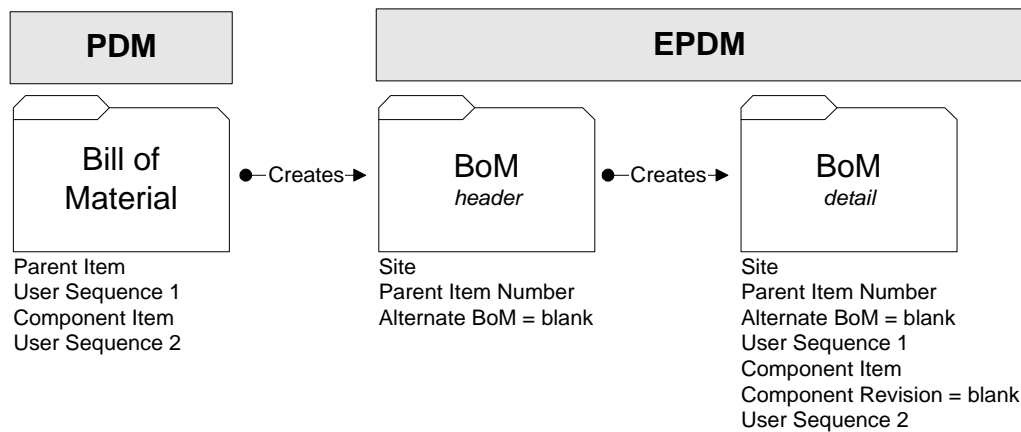
Facility

This diagram shows the Facility migration.

PDM	EPDM
Production Facility	**Facility** *header*
●—Creates→	
Production Facility ID	Site
	Facility ID
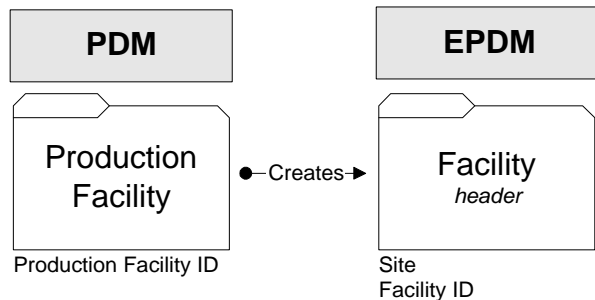
All facilities that are migrated from PDM are associated with the default site.

Routing

This diagram shows the Routing migration for the routing and routing descriptions.

PDM	EPDM

```
Routing        ●—Creates→     Routing          ●—Creates→    Routing
                               header                         Operations
                                                              detail

Parent                        Site                           Site
Operation                     Routing ID for Parent Item     Routing ID for Parent Item
                              Version = blank                Version = blank
                                                             Operation Sequence


Routing        ●—Creates→     Routing
Descriptions                  Descriptions

Parent                        Site
Operation Sequence            Routing ID for Parent Item
Description Sequence          Version = blank
                              Operation Sequence
                              Description Sequence
```
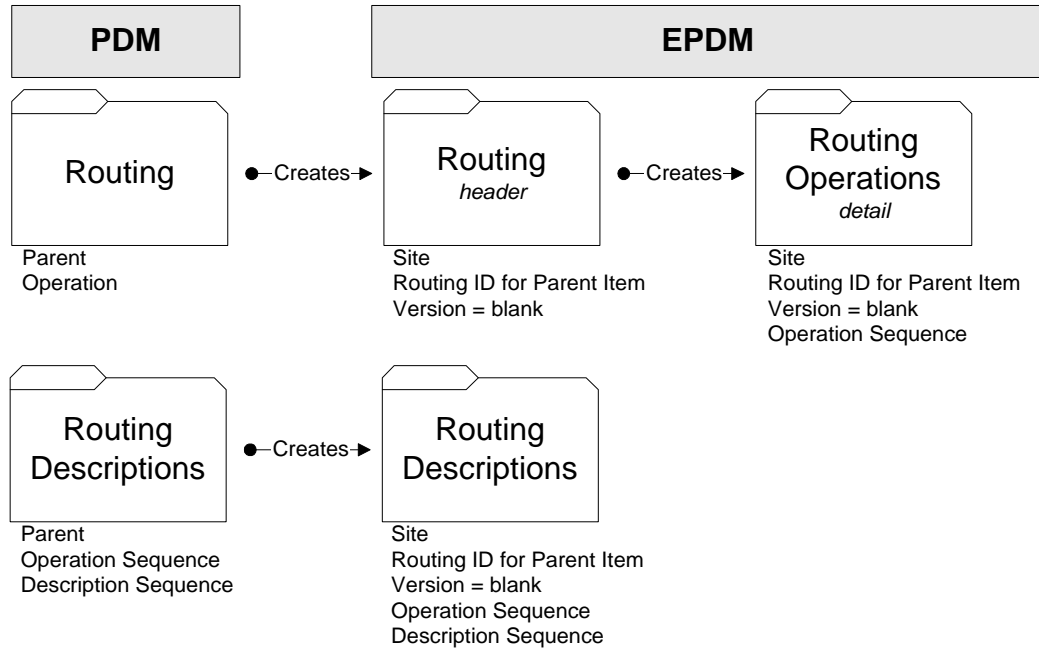
Activating EPDM

If you have chosen to migrate engineering data without activating EPDM, you can check to be sure the migration is successful before you do so. After you activate EPDM, PDM is de-installed, and you cannot migrate files from PDM to EPDM again.

The migration of PDM files and activation of EPDM are two separate steps to allow you the flexibility to use EPDM and test the migration before going "live" with EPDM. You can perform the migration many times before activating EPDM, but once it is activated, migration cannot be done again.

Chapter 3: Sites and Facilities

Introduction

The site object and the concept of site are part of EPDM's organization of engineering records. In PDM, the site is not defined but understood — all engineering records belong to an undefined, single site. EPDM uses the concept of site to open up the one-site-to-one-item relationship and give you the power to define sites and use them in new ways.

The most obvious advantage of using many sites is to group engineering records for your own purposes — to reflect actual physical sites that can now have their own engineering records with access to the enterprise-wide Enterprise Item Master file. You can also define sites to mirror an engineering phase process: design, production, and manufacturing.

EPDM has two functionally different sites, production and simulation. A production site is needed to migrate engineering records from an existing PDM environment and to control and manage the sharing of item revisions. A production site can be thought of as the "real" site that stores information about your manufacturing operations. EPDM requires that you define at least one production site. When migrating from PDM to EPDM, the warehouse records in the Warehouse master require a site.

Simulation sites are used as a workbench for planning, testing, and costing changes in your real production environment. You can copy all engineering records from a working production site to a simulation site. After you have used the simulation site to learn all that you want about costing options and alternative routings and processes, you can delete the simulation site. To gather a history of the changes you made to the simulation site, print a history of maintenance transactions for the site based on user ID or reason codes over a period of time.

See "Chapter 6: Costing" on page 60 for a discussion of Costing Simulation.

Defining facilities

Facilities are another name for work centers that identify where a step in the manufacturing process is completed. You define facilities in EPDM and associate them with a site. In a repetitive environment, facilities can be workstations or production lines.

Defining production sites

Production sites can be defined to organize and control your manufacturing process in ways that make the most sense for your business goals and standard operations. Create sites to reflect your business model.
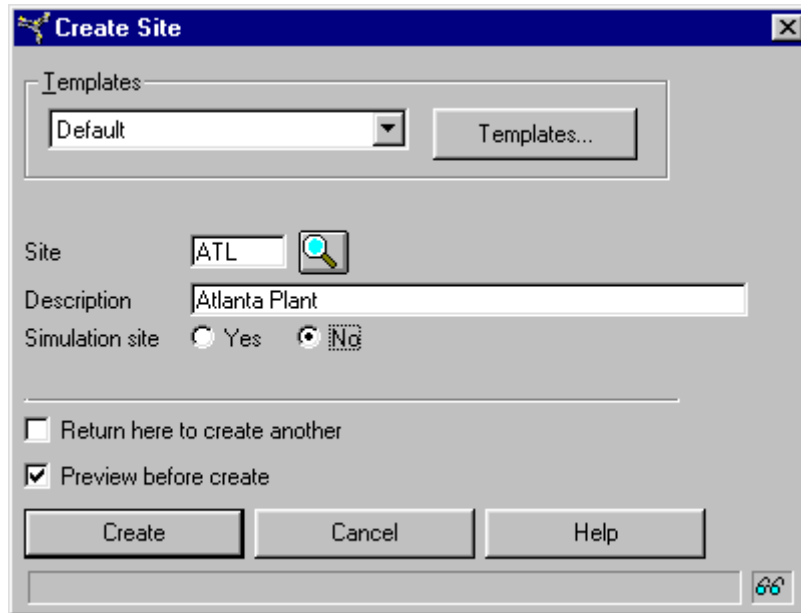
Production sites can have many warehouses and many facilities linked to them. They do not share warehouses or facilities, but are defined as distinct sites with separate warehouses and facilities.

Define sites that allow you to model, analyze, and improve your own working environments. EPDM requires that you specify whether a site is a production site in your environment or a simulation site.

This illustration shows some sample production and simulation sites.

Sites

Peachtree Plant Production	Atlanta Plant Production	Design Engineering Simulation	Manufacturing Engineering Simulation	Cost Accounting Simulation

Bills of Material

Multiple warehouses and facilities

One warehouse and multiple facilities

Facilities are unique workcenters with different labor rates. Routings are also added.

Cost is run to establish a baseline. Make changes and run again to see the effect of the change.

Sites in use: production and simulation

This illustration shows an EPDM database with simulation sites and production sites. It also illustrates the way warehouses can be used.
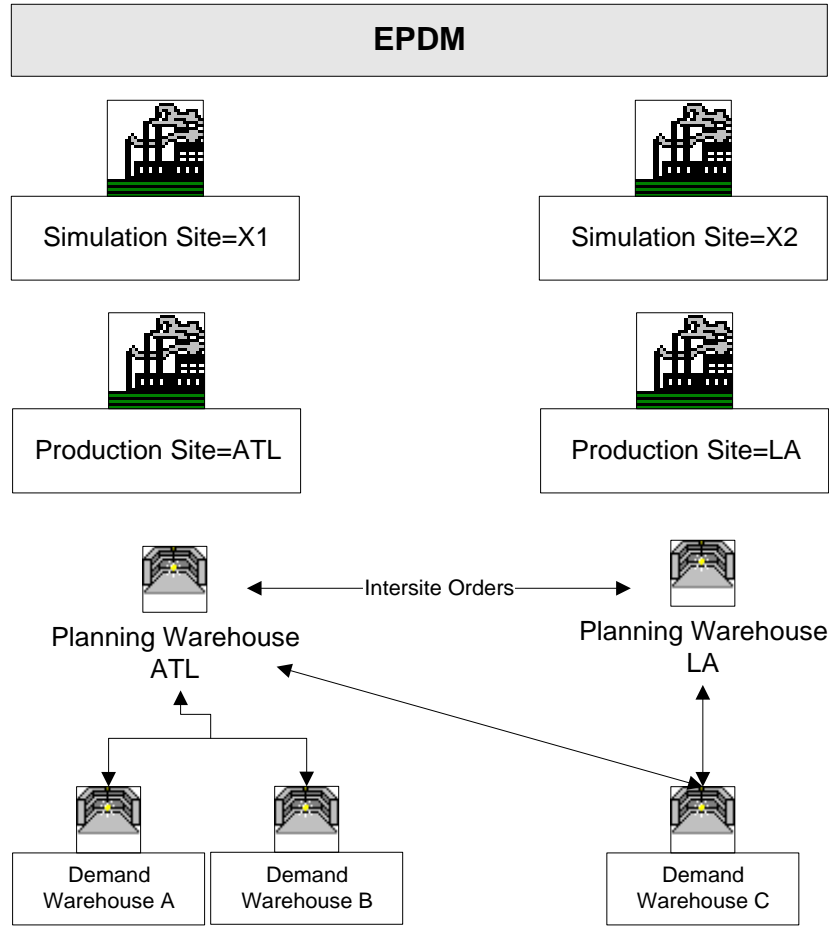
Warehouses point to the site that they use. This table shows site item revision records for demand warehouses A and B associated with the ATL production site and demand warehouse C associated with LA production site.

Demand warehouse	Item	Site	Site-Item-Revision
A	X	ATL	ATL-X-1
B	X	ATL	ATL-X-1
C	X	LA	LA-X-1
C	Y	LA	LA-Y-5

Sites and product costing

You can run product costing from within a site. The labor, manufacturing overhead, and purchase overhead table are each stored by site and display on cards in the Site object. You can run selective costing for an individual item, all new items, or just those with incomplete costs. In addition, selective costs can be controlled using the same subset criteria using on list cards.

You can run product costing for current costs, standard costs, or both. You can copy current costs to standard costs for one or more sites. Using the feature called *Include affected assemblies*, you can automatically recost the parents of a recosted item, and then recost of the parents of those items, all the way up the where-used chain. This saves you the steps of performing follow-on product costing runs for all the upper-level assemblies. For more information, see "Chapter 6: Costing" on page 60.

Sites and warehouses

A warehouse points to a site. More than one warehouse can point to a site but it makes sense to do this only if the costs of materials, labor, and machines are comparable for the warehouse. When warehouses and sites are linked, you can delete a warehouse that points to a site.

Many warehouses pointing to one site can indicate a central engineering site. However, when you define facilities you should be sure that the facility IDs are unique when labor rates, for example, for a facility differ from site to site.

When defining sites and warehouses consider:

- Do the warehouses manufacture the same products? When the answer is Yes, go on to compare costs:

- Are purchase costs for the same item equal?

- Do facilities have the same labor and machine costs?

A common site for many warehouses may only apply if the warehouses are in the same region and there are centralized administration servers.

Defining simulation sites

A simulation site, like a workbench, does not affect the "real" information base. You can create a simulation site, copy engineering records from production site into the simulation site, and manipulate the item processes and costing to investigate manufacturing options. A simulation cannot release manufacturing orders or interface to other applications. You can copy a production site to a simulation site interactively through the client or through offline maintenance on the System i.

Simulation Site from Production Site
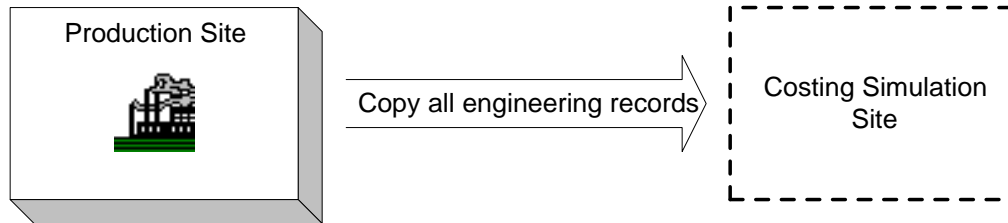
Costing with simulation sites

Use simulation sites to analyze costs by site and item revision. You can also use them to develop new product costs for an upcoming year or store costs from a previous year along with the database that produced the costs. When you create a simulation and copy into the simulation site the engineering records you want to work with, be sure that you run a baseline costing on the records as they exist. Then when you make the changes and run costing, you can see the results in the new costing information.

You cannot transfer costs from a simulation to a production site. Simulation sites that are used for "what if" experiments exist to be used and then deleted. They do not have warehouses associated with them.

Costing simulations, however, can be saved and reused For more information on costing and how to create costing simulations, see "Chapter 6: Costing" on page 60.

Copying engineering records between sites

EPDM allows you to:

- Copy a single item and its associated engineering records from one site to another.

- Copy all items and their associated engineering records from a production site to a simulation site.

- Mass copy all engineering records from one production site to another, adding to the target site all records from the source site that are not already in the target site.

Defining a facility

When you define a facility, you enter a site ID to identify the facility as belonging to the site. Facilities are the work centers of your manufacturing process. They identify not only actual production stages but also reflect the labor rates paid at these stages. As you define facilities for a site, keep in mind the labor costs at each facility, making sure to assign unique facility IDs to correspond to different labor rates.
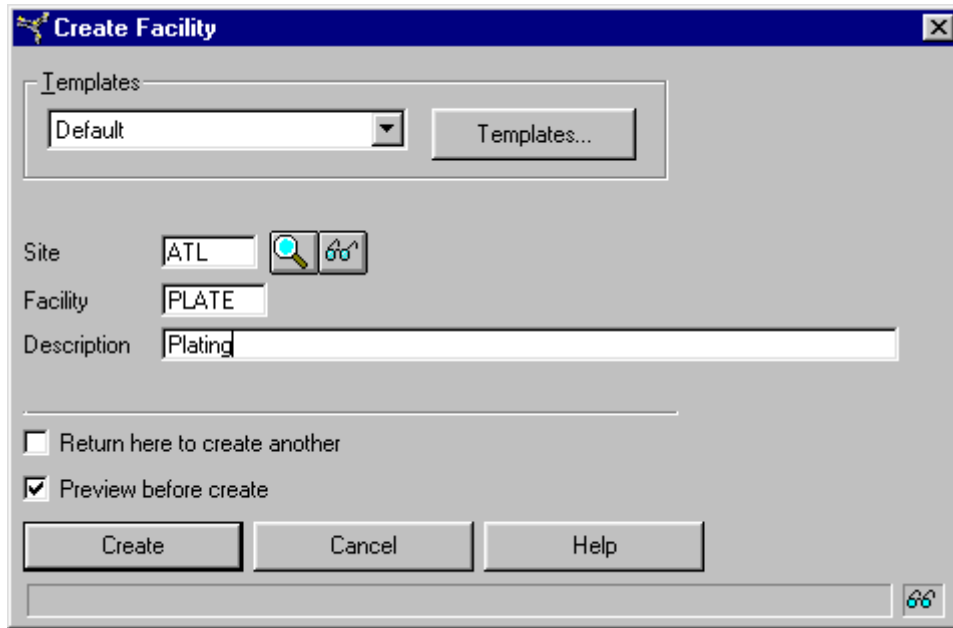
The following graphic shows the relationship between the PDM Work Center master file and the EPDM Facility master file:
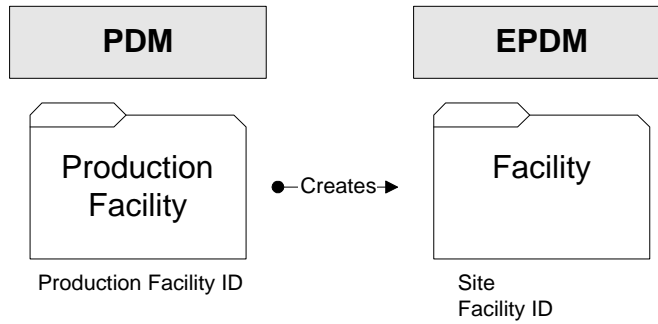
Chapter 4: Items, Routings, and Bills

Introduction

These are basic definitions for Enterprise Product Data Management:

- An *item* is any raw material, manufactured or purchased part, subassembly, assembly, or end item.

- A *bill of material* is a list of components or raw materials and the quantities needed to make an item.

- A *routing* is a sequence of operations required to make a manufactured item.

Items, bills of material, and routings are more complex and more powerful in EPDM than PDM. Items can now have revisions, routings can now have versions, and bills of material can now be primary or alternate. They can be used in many different, independent combinations.

Because of the complexity of these shared relationships, EPDM uses a concept called the item process. An item process is made up of an item revision plus a routing and a bill of material. An item process record is automatically created with each item revision record that is created.
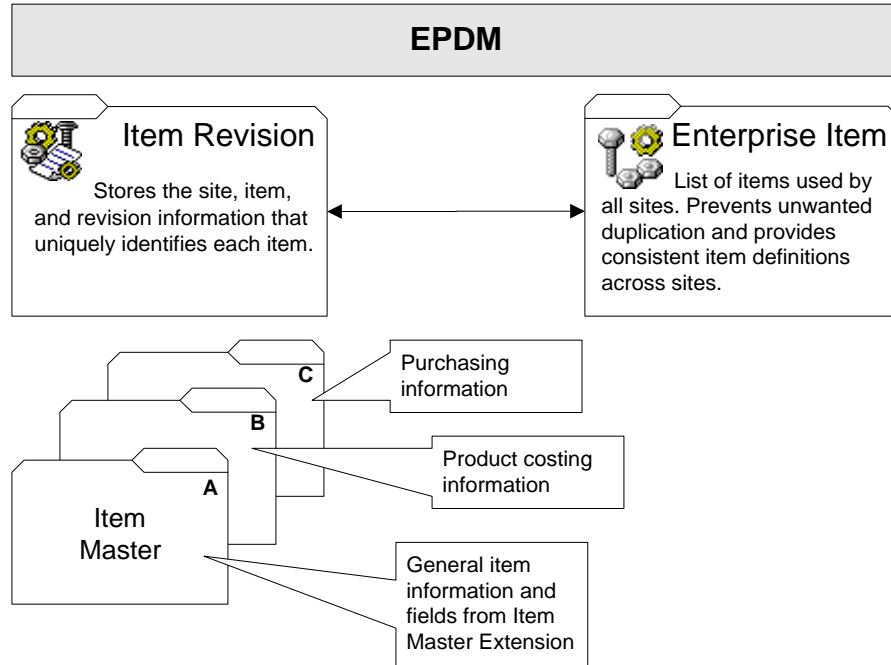
Defining items

EPDM uses the Item Revision object for item information. The item revision information is stored in three item revision files A, B, and C. File A stores general item information and data from the item master extension file. File B contains product costing information and File C stores purchasing information.

Each item is identified to the enabled applications by a combination of three key fields:

- Site

- Item

- Revision

The Item Revision object contains records for all sites. Each site-item-revision can have a different routing and bill of material and can be costed separately.

EPDM also stores one reference for each item number from the Item Revision A file in a parallel file called Enterprise Items. Items in this file are identified only by item number. This file is an enterprise-wide file for all sites. This helps to ensure that an item is defined only once within the enterprise.

EPDM

Item Revision

Stores the site, item, and revision information that uniquely identifies each item.

Enterprise Item

List of items used by all sites. Prevents unwanted duplication and provides consistent item definitions across sites.

C

B

A

Item
Master

Purchasing information

Product costing information

General item information and fields from Item Master Extension

For example, site ATL has defined item I100 in an Item Revisions file. You start to define the same item, I100, for site DET. Rather than create a duplicate item, you can copy the item description from Enterprise Items.

Site ATL

Site DET

Item Revision

Item I100

Item Revision

Item I100

Enterprise Item

Item I100
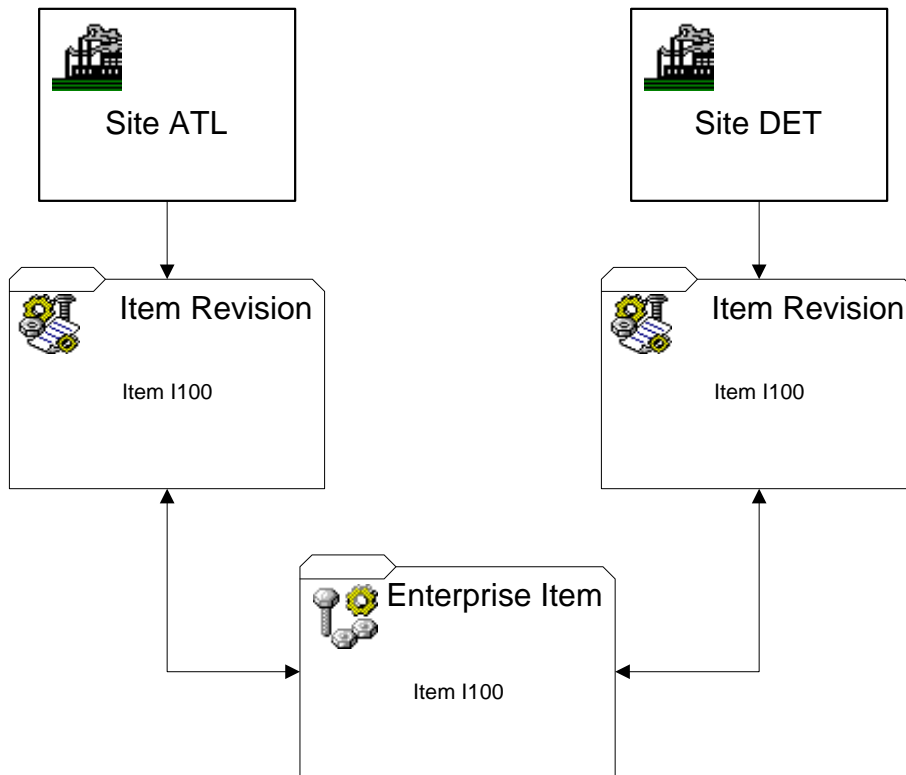
A note of caution about simulation sites

When you add an item revision record to a simulation site and then delete the simulation site, the record that was added to Enterprise Items is not deleted. You should periodically maintain the Enterprise Items files and remove all item records that are not used in any of your sites. The Enterprise Item record is not automatically deleted for simulation or a production site. You have to manually remove those records.

EPDM item revisions

How and why do items acquire revisions? To answer this question we can look at three essential properties of an item:

- Form

- Fit

- Function

Form is the configuration of an item such as shape, size, density, weight, or other physical properties that identify the item. *Fit* is the characteristic that allows an item to connect to or become an integral part of another item. *Function* is the use or performance of an item.

Engineering changes drive the creation of revisions for an item. When an engineering change affects the form, fit, or function of an item, a new item should be created. All other changes can result in a revision. Revisions are usually assigned identifiers that are sequential either numerically or alphabetically. You can use up to six characters to designate a revision. Since all revisions of an item are assumed to be interchangeable (form, fit, function), inventory is not tracked by revision.

When you do not know an item revision but need to enter it, EPDM displays a list of all revisions for an item in a site.

Revisions, in effect, extend item information to let you define various manufacturing processes and run costs by site, item, and revision. Manufacturing orders can also be released to build a revision.

Enabled programs "see" revisions and follow these rules when selecting a revision:

- Selection of the currently effective revision is controlled by effective from and to dates.

- Note that a blank revision is valid.

Revision identification across XA

Most Infor ERP XA applications are fully enabled with EPDM. When EPDM is installed, the XA applications refer to the current item revision for item information.

Item Revision control

EPDM allows items to belong to multiple sites with multiple revisions within each site. Each item revision contains an Effective from and Effective to date to define the range of dates when that item revision is effective or "in effect." The Effective from and Effective to dates are not required to be consecutive from one revision of an item to the next. Therefore, on a given date for any specific item and site, the number of revisions that are in effect could be one, none, or multiple revisions. EPDM identifies only one item revision as the current revision for each item and site for a specific date. Unless otherwise specified, the current revision is the source of item-related information in an EPDM-enabled environment at the Release 9 level. The current item revision

replaces the Item Master file as the source of item-related information for the Infor ERP XA essential applications.

Current Item Revision function

The Current Item Revision function calculates the current revision for an item and site combination for a particular date, usually the system date. If only one revision for an item and site has an Effective from and Effective to date range that includes the system (or target) date, that item revision is the current revision. The Current Item Revision function determines the current item revision for other situations by analyzing the Effective dates based on the following criteria. If more than one revision meets the first criteria, the function selects from among those revisions using the second criteria. If more than one revision meets the second criteria, the function uses a final selection criteria based on revision number.

If multiple item revisions are effective on the same system date, EPDM selects the current item revision based on these criteria.

First criteria	Second criteria	Final criteria
Revision that will expire last (latest Effective to date)	Last revision to become effective (most recent Effective from date)	Highest revision number

If no item revisions are effective on the system date, but previous item revisions exist, EPDM selects the current item revision based on these criteria.

First criteria	Second criteria	Final criteria
Revision that expired most recently (most recent Effective to date)	Last revision to become effective (most recent Effective from date)	Highest revision number

If no item revisions are effective on the system date and no previous item revisions exist, but future revisions do exist, EPDM selects the current item revision based on these criteria.

First criteria	Second criteria	Final criteria
Next revision to become effective (nearest Effective to date)	Next revision to expire (nearest Effective to date)	Lowest revision number

The revision that is current for an item and site can change because of several factors, such as adding or deleting an item revision record, maintaining the Effective from and Effective to dates in any item revision, or by passing of time that changes the system date to a new date.

Item Revision Control function

The Item Revision Control function performs an analysis whenever a user action could potentially cause another item revision to become the current revision for the item site. EPDM then

recalculates the current revision for the item and site, which might result in a new current item revision being applicable.

The Item Revision Control function also automatically monitors the system date for changes and compares the new system date and the Last analysis date for the site to the Effective dates of all item revisions to determine if the new system date could affect which item revision is the current revision. This unattached job function normally runs at midnight (system time). If the Effective from or to date for any item revision in a site is earlier than or equal to the system date and also later than the Last analysis date, the current item revision might have changed. EPDM then recalculates the current revision for the item, according to the rules described previously.

Whenever EPDM identifies a new current item revision, whether due to a new system date or user action, the Item Revision Control function recalculates the new current item revision, generates the appropriate transactions, and updates the associated files as needed, including the Item Release, Item Master, Item Site, Inventory Transaction History, and General Ledger Interface files. Specifically, these transactions and updates occur.

- Updates Item Site file with new current revision number.

- Logs Change transaction for Item Site file to Maintenance History.

- If Unit Cost Default is the cost basis for the item, and if the Unit Cost Default value is different in the new current revision, then EPDM generates Cost Update (CU) transactions and logs them to Inventory Transaction History and to the General Ledger Interface file, as required.

- If the item revision has been released, as indicated by an Item Release record for the previous current revision, and if the Auto sync attribute is set to Yes, then EPDM updates the Item Release and Item Master files from the new current item release.

For example, an analysis is run on August 21, 2009, with a Last analysis date of August 20:

Item revision	Effective from	Effective to	Result
ABC revision 1	January 1 2009	September 1, 2009	Replaced by revision 2 as the current revision
ABC revision 2	August 21, 2009	December 31, 2009	Becomes the new current revision

An analysis is run on October 31, 2009, with a Last analysis date of October 30:

Item revision	Effective from	Effective to	Result
ABC revision 1	January 1 2009	September 1, 2009	Expired revision, no change
ABC revision 2	August 21, 2009	December 31, 2009	Current revision, no change
ABC revision 3	January 1, 2010	July 31, 2010	New revision not effective at this time, no change

An analysis is run on January 1, 2010, with a Last analysis date of December 31, 2009:

Item revision	Effective from	Effective to	Result
ABC revision 1	January 1 2009	September 1, 2009	Expired revision, no change
ABC revision 2	August 21, 2009	December 31, 2009	Replaced by revision 3 as the current revision
ABC revision 3	January 1, 2010	July 31, 2010	Becomes the new current revision

Note that a revision is effective from and including the Effective from date up to but not including the Effective to date. In the third example, no revision had dates in effect on December 31. In this case, ABC revision 2 was the current revision on December 31 because that revision had the most current Effective to date on December 31.

Check current revision

By default, EPDM checks the current revisions in each site in an XA environment every time the system date and time reaches midnight. However, to check the current revisions at another time, you can run the Item Revision Control host job for a selected site. This host job allows you to start the Item Revision Control function manually. The function performs the same check of current item revisions when run from the host job as performed automatically at midnight. When you run the Item Revision Control function from the host job from the Sites object, you can specify a subset of item revisions to be checked. When the function runs automatically at midnight, it checks all item revisions.

While the automatic performance of the Item Revision Control function determines the current item revision, the Item Revision Control host job provides a quick way to check and potentially update the current revisions for all items in a site or for a subset of selected items in the site. When an item revision is created or deleted or when Effective from or to dates are changed, the current revision should be recalculated. However, in abnormal circumstances, such as a hold on the u-job that prevents the Item Revision Control monitoring function to run, the Item Revision Control job gives users a way to correct any discrepancies or out-of-sync conditions. The same rules apply to determine the current item revision apply whether the function runs automatically at midnight or from the host job.

Release Item Revisions options

While item information in Release 9 is maintained in the Item Revisions object, the legacy Item Master file records in PDM are also retained. For user-written, third-party, and other non-XA-essentials functions, the Item Master data is still available and still can be updated with changes from the Item Revisions object. This type of action is known as releasing Item Revisions data from EPDM to the Item Master file in PDM.

The Initial release option from the Item Revisions object has three choices:

- **No:** do not release the item revision and do not update Item Master. With this option, the creation of a new item revision does not update any Item Master information.

- **Yes:** release the item revision and update the Item Master but do not activate the Auto sync function. This option updates the corresponding Item Master record with information from the newly created item revision. This option will also update the Item Master record with changes to the specific item revision, but will not keep the released item revision in sync with the current revision.

- **Yes, auto sync:** release the item revision, update the Item Master, and activate the Auto sync function. This option updates the corresponding Item Master record with the new item revision information and with any later changes to the item revision. The Auto sync function also will monitor the current item revision associated with the released item and site. When a new revision becomes current, the Auto sync function automatically releases the new current revision and updates the associated Item Master records.

The Auto sync function keeps the Item Master data automatically synchronized with the current item revision for the released item and site and updates item data when current item revisions change. If the Initial release option is set to No, the item revision can later be released to the Item Master file by selecting either the Release or Mass Release option on the Maintain menu of the Item Revisions object. Both of these Release options can also be used to select or deselect the Auto sync setting for an item.

A recommended task after installation of Release 9 is to use the Mass Release option to release your current item revisions to PDM. It is important to select the **Current revisions** subset when you use this option. If you want to initiate automatic synchronization for current item revisions, select the Auto sync option on the Mass Release Item Revisions dialog. The mass release of the current item revisions updates the item information in the Item Master file to be equivalent to the current item information in the Item Revisions object for the released item and site, which ensures that any user-written functions or other outside functions interfacing with XA can access Item Master information that is equivalent to the current tem revision for the released item and site.

Controlled attributes

In addition to the enhanced control of the current item revision, EPDM adds a new level of maintenance for item revision data across all item revisions for certain attributes. Users can control the values for these selected attributes in all revisions of an item within a site or all revisions of an item across the enterprise, depending on the level of control allowed.

With EPDM enablement, the Item Revisions object becomes the source of information that was previously provided in the Item Master file. However, because an item revision that is current can change due to user action or the passage of time, the values in some critical attributes could change unexpectedly. The controlled attributes feature protects the data integrity of on-hand inventory, open orders, and inter-warehouse activity against potential problems that might occur if new revisions become current with different values for these critical attributes.

For some of the attributes, the control exists at the Enterprise level. All revisions of an item within an enterprise, across all sites, will have the same value for an attribute controlled at that level. The Stocking unit of measure and Inventory code attributes are controlled at the Enterprise level. Other attributes are controlled at the Site level. To enable control at the Site level, XA Release 9 adds an Item Site file. This file contains information used to control and identify the current item revision, provide control for specific item revision attributes within a site, and provide an audit trail for current item revision changes. The Item Site file is maintained automatically by EPDM when item revisions are created and maintained within a site. This file cannot be accessed directly by users.

This table identifies the controlled item revision attributes and the level of control implemented for each attribute.

Attribute name	Attribute description	Level of control	Comments
UNMSR	Stocking U/M	Enterprise Item	All revisions of an item within an enterprise will use the same unit of measure for stocking the item.
INVFG	Inventory code	Enterprise Item	All revisions of an item within an enterprise will be the same classification in inventory.
UCDEF	Unit Cost Default	Site (default value)	The unit cost can vary by revision between and within sites for this item. For convenience, the Unit Cost Default value of the current revision is stored at the Site Item level.
BLCF	Batch/lot control	Site	All revisions of an item within a site will have the same batch/lot control setting.
ALLOC	Discrete allocations	Site	All revisions of an item within a site will have the same discrete allocations setting.
INTYP	Inspect-on-receipt	Site	All revisions of an item within a site will have the same inspect-on-receipt setting.

Attribute name	Attribute description	Level of control	Comments
ITTYP	Item type	Site (in some cases)	For these item types, the value can vary by revision. The default value is stored at the Item Site level: 1=Assembly, 2=Fabricated item, 3=Raw material, 4=Purchased item, or 9=User option. For items that are type 0=Phantom, F=Feature, or K=Kit, all revisions within a site will have the same value.
QCTYP	QC (shelf life)	Site	All revisions of an item within a site will have the same QC value.
QCDAY	Shelf life days	Site	The default value is stored at the Item Site level, but the value can be overridden within revisions.

Default values for controlled attributes

For attributes controlled at the Enterprise level, EPDM maintains an Enterprise Item file with default values for those attributes. EPDM automatically updates default values for the Stocking unit of measure and the Inventory code in the Enterprise Item file.

Similarly, for attributes controlled at the Site level, EPDM maintains an Item Site file with default values for the item revisions within the site. This file is created and updated automatically when item revisions in the site are maintained. When you create an initial item revision within a site, EPDM creates an Item Site record automatically for the item revision. The values entered for the controlled attributes in the new item revision are set as default values in the Item Site record. For some controlled attributes, as specified in the preceding table, the Item Site record contains the default value for the attribute, which must be the same in all revisions for an item. For other attributes controlled at the Site level, the default value for the controlled attribute can be overridden in the revisions for an item.

Maintenance for controlled attributes

After the initial item revision is created, the controlled attributes within an individual item revision record are not maintainable using the Change option. Instead, these attributes have a Change Item Revisions button next to them that must be clicked to start maintenance. Clicking the Change Item Revisions button next to any of the controlled attributes invokes the Change Item Revisions dialog. This dialog contains all of the attributes for the item revision that are controlled at either the enterprise or site level. Any change to the values on this dialog changes the value for all revisions of the item, either within the enterprise or within the site.

Item Type (ITTYP)

With the Item type attribute, EPDM enforces two levels of control, depending on the Item type value.

For these Item type values, the default value for the item revision is stored in the Item Site file: 1=Assembly, 2=Fabricated, 3=Raw material, 4=Purchased, or 9=User option. The value can be overridden for any revision of the item, as long as the original and overridden values are either 1, 2, 3, 4, or 9. A warning message does appear if the overridden value is not equal to the default Item type value for the item. This flexibility allows specific revisions to be either manufactured or purchased.

For item revisions with Item type values of 0=Phantom, F=Feature, or K=Kit, the attribute is controlled at the Site level. All revisions of an item within a site must have the same Item type value when the default value equals 0, F, or K. In this situation, the Item type value cannot be overridden for an individual revision of an item. The Item type value can be changed from 0, F, or K, but any change applies to all revisions of the item within the site.

When a user adds an item revision, and no revision already exists in the site specified for the item, then any of the values for Item type can be selected. If a revision already exists for the item, then the initial value for the Item type attribute comes from the default value in the Item Site file.

- If the default value for Item type is 1, 2, 3, 4, or 9, the Item type value for the new item revision can be set to any of those values.

- If the default value for the item type is 0, F, or K, then the Item type value cannot be changed while creating the item revision.

- After the item revision has been created, the Item type value can be changed, but how it can be changed depends on the original value in the Item type attribute. If the original Item type value is 1, 2, 3, 4, or 9, the following rules apply.

- If the original Item type value is 1, 2, 3, 4, or 9, and the user wants to change the value only for the individual revision and not all revisions for the item and site, the value can be overridden on the Item Characteristics card. The available values for selection are 1, 2, 3, 4, or 9. If the overridden value is different than the default Item type value, a warning message appears. This change affects only the Item type value in the revision being changed.

- If the original item type value is 1, 2, 3, 4, or 9, and the user wants to change the value for all revisions for the item and site, the value can be changed by clicking the Change Item Revisions button next to the Item type attribute. On the Change Item Revisions dialog, any value can be selected, but the change affects the Item type value for all revisions of the item and site. If the overridden value is different than the default Item type value, a warning message appears.

- If the original Item type value is 1=Assembly or 2=Manufactured, the value can be changed to 3=Raw material or 4=Purchased item unless the item has bill of material components.

If the original item type value is 0, F, or K, the following rules apply.

- If the original Item type value is 0, F, or K, the value can be changed only by clicking the Change Item Revisions button next to the Item type attribute. On the Change Item Revisions dialog, any value can be selected, but the change affects the Item type value for all revisions of the item and site.

- If changing the value to F=Feature, the Standard batch quantity for the item must be set to 1.

- The value cannot be changed to F=Feature if the item is used in a bill of material, routing, orders, etc.

- If changing the value to K=Kit, the item cannot have a product structure.

- The Inventory code value for the item must be 4=Unstocked in order to change the Item type value to Kit.

- If changing the value to K=Kit, the item cannot have an Item Balance record.

Inventory Code (INVFG)

All revisions of an item in all sites within an enterprise must have the same inventory code. This requirement ensures that the item revisions across all sites are stocked or not stocked consistently and that existing orders and transfers of the item across sites can be handled appropriately. For example, an item revision cannot be specified as inventory and stocked in the Item Warehouse object in one site and transferred to another site where it is handled as a service or miscellaneous item.

The Inventory code attribute can be changed from Inventory to Miscellaneous, Service, or Unstocked if these conditions are met.

- If the Item type value is 3=Raw material, 4=Purchased item, or 9=User option, the Inventory code can be changed to a non-inventory value of Miscellaneous, Service, or Unstocked. If the Item type value for the item revision is type 1=Assembly or subassembly or 2=Fabricated item, the item cannot be changed from an Inventory code of Inventory to Miscellaneous, Service, or Unstocked.

- The Batch lot control value must be No for Miscellaneous or Service items.

- Only item revisions with an Inventory control value of Inventory can have Quality control = Yes, Inspect on receipt = Yes, or Discrete allocations = Yes.

- If Product Structure records exist for any revisions of the item, the Inventory code value cannot be changed to Miscellaneous, Service, or Unstocked.

The Inventory code attribute can be changed from Miscellaneous or Service to Inventory under these conditions:

- If no open purchase orders or manufacturing orders exist for any revisions of the item across all sites, the Inventory code can be changed to Inventory.

- If any open purchase orders or manufacturing orders exist for any revisions of the item across all sites, the Inventory code cannot be changed.

Stocking Unit of Measure (UNMSR)

All revisions of an item in all sites within an enterprise must have the same stocking unit of measure. This requirement ensures that the item is stocked, costed, and sold in a consistent unit of measure and that transfers of the item across sites are done using the same type of quantity; for example, a quantity of an item stocked in a warehouse for one site in feet is transferred into a warehouse in another site in feet and not in meters.

The Stocking unit of measure attribute can be changed in either of the following situations.

- The units of measure are equivalent. The global unit of measure conversion factor is 1.0 for the previous and new units of measure.

- The Quantity and Quantity per values are zero for this item. Quantities and Product Structure records do not exist for any revisions of the item.

If open orders exist for any revisions of the item, the Stocking unit of measure can be changed, according to the conditions listed above, but the change will cause a warning message.

Quality Control (QCTYP)

All revisions of an item with a site must have the same Quality control value. If this value is not consistent across all revisions of an item, problems can occur in existing Location Quantity records for the item revisions.

The Quality control attribute can be changed from No to Yes under these conditions.

- If the item revision has Location Quantity records with a Quality control code of 20=Not shelf life, this change is allowed.

- If the Shelf life days value is 0, the Quality control attribute cannot be Yes.

The Quality control attribute can be changed from Yes to No under these conditions.

- If the item revision has Location Quantity records with a Quality control code of 10=Shelf life item, not expired, this change is allowed.

- If the item revision has Location Quantity records with a Quality control code of 19=Expired shelf life, this change is allowed.

- If the Shelf life days value is not 0, the Quality control attribute cannot be No.

Shelf Life Days (QCDAY)

The Shelf life days value can vary among revisions for an item and site. EPDM maintains a default value at the item and site level, but users can override this value in the item revision.

The Shelf life attribute can be changed, but the changed value is restricted by the Quality control value for the item revision. If the Quality control value is Yes, then the Shelf life in days must be greater than zero. If the Quality control value is No, the Shelf life in days value must be zero. The Shelf life in days value cannot be a negative number.

Batch/Lot Control (BLCF)

All revisions of an item within a site must have the same Batch/lot control value. The Batch/lot control attribute is a key for the Location Quantity file. If this value is not consistent across all revisions of an item, problems can occur in existing Location Quantity records for the item revisions.

The Batch/lot control attribute can be changed from No to Yes. However, if a Location Quantity record for a revision of the item has a blank Batch/lot control attribute, a warning message appears.

The Batch/lot control attribute can be changed from Yes to No if the Quality control value is No. If the Quality control value for the item revision is Yes, the Batch/lot control value must be Yes. Also, if changing this value from Yes to No creates duplicate Location Quantity records, a warning message appears.

Inspect on Receipt (INTYP)

All revisions of an item with a site must have the same Inspect on receipt value. If this value is not consistent across all revisions of an item, problems can occur in existing Location Quantity and Receipts to Inspection records for the item revisions.

The Inspect on receipt attribute can be changed from No to Yes. The Inspect on receipt attribute also can be changed from Yes to No, but if any of the revisions have quantities waiting for inspection in the Location Quantity file with Quality control codes of 17, 80, or 90 (awaiting inspection or rejected), a warning message appears indicating that the unprocessed Inspect on receipt quantities exist. The same message appears if any revisions of the item have records in the Receipts to Inspection file.

Discrete Allocations (ALLOC)

All revisions of an item with a site must have the same Discrete allocation value. If this value is not consistent across all revisions of an item, problems can occur in existing Allocation Quantity records for the item revisions.

The Discrete allocations attribute can be changed from No to Yes. The Discrete allocations attribute also can be changed from Yes to No, but if this change creates duplicate Allocation Quantity records, a warning message appears.

Unit Cost Default (UCDEF)

The Unit cost default value is maintained but not controlled at the item revision level. Each individual item revision can have a unique value for this attribute. EPDM stores the Unit cost default value for the current item revision at the item and site level. This value is for audit purposes and is not used to enforce a consistent Unit cost default value across all revisions of the item in the site. No error or warning messages occur when this value is changed for an individual item revision.

XA generates CU transactions (Standard unit cost default replacement) as needed when the Unit cost default value changes. For example, if a new item revision becomes the current item revision, and the new current item revision has a different Unit cost default value than the previous current item revision, a CU transaction is generated for each item warehouse for the item where the Unit cost default value is used for inventory accounting.

Item life cycle and status codes

The implementation status assigned to an item revision, and status code values contained in that implementation status, determine how Infor ERP XA processes information for that item revision. For information on using implementation statuses for item revisions, see "Controlling engineering records with implementation statuses" on page 56.

Maintaining items and item revisions

Use the Maintain menu or Create, Change, Delete and Copy buttons on the EPDM toolbar in Item Revisions to create, change, delete and copy item revision records.

Use the Maintain menu in Enterprise Items or toolbar to create, change and delete item records in the Enterprise Item Master file.
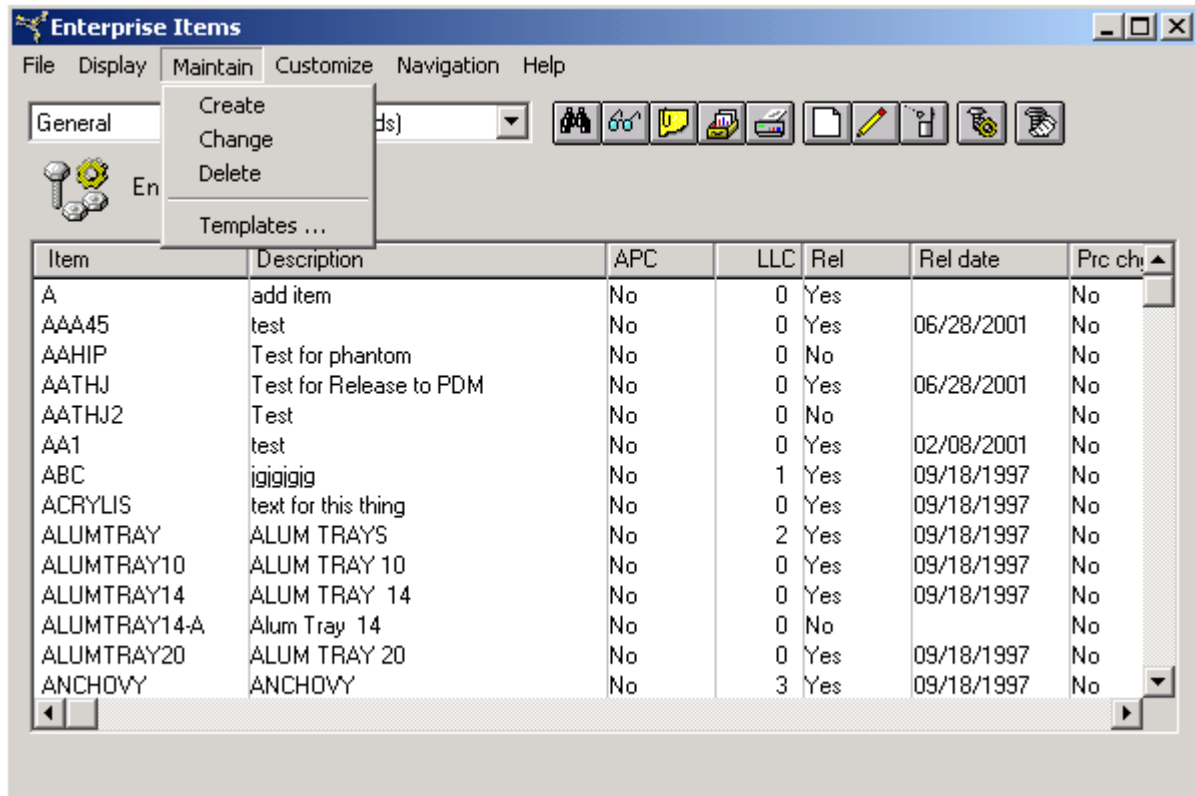
Item revision local and foreign language descriptions

Another item revision feature lets you enter and maintain text descriptions in multiple languages for items by revision. The definition includes a translated description and up to two longer descriptions.

You assign language codes to the foreign languages that you use to enter and maintain the item descriptions. An item can have descriptions in as many languages as there are language codes, but each language code can be used for only one description per item.

The Descriptions card in the Item Revisions object displays both the local language description for the item revision and a list of foreign language descriptions entered for that revision.

To add or change the local language description, you can enter text in the Description attribute. EPDM automatically enters or changes the text in the 10-character and 20-character attributes based on the 40 characters of text allowed in the Description attribute. If the description requires more than 40 characters, users can enter that text in the Extended attributes.

To add or change foreign language descriptions, you can click the Create or Change buttons in the Foreign Languages section of the Descriptions. Clicking the Create button opens the Create Item Revision Foreign Language Description dialog, where you specify the language to be used for the description and the text of the description. The translated description allows the same set of descriptions as for the local language descriptions: a 40-character primary description, 10- and 20-character truncated descriptions, and two additional 40-character attributes for extended description text. Clicking the Change button opens the Change Item Revision Foreign Language

Description dialog, where you can change any of the description text. The language cannot be changed.

Item revision base prices

You can also enter and maintain base prices for items by revision. The definition includes the base price, the pricing unit of measure, the item price class and an effective date that determines the base price to be used at any given time.

Each base price is identified by its site, item, item revision, and effective date. This allows an item revision to have many base prices. However, only one base price can be effective at a given time.

If you maintain current base price fields on the item revision, the currently effective base price is updated with the new value. If there is no currently effective base price, one is created using the date 1/01/50 as its effective date.

Item Revision Foreign Prices

The Item Revision Foreign Prices object contains prices for item revisions in currencies other than the local currency. With this object, an item revision can have multiple prices in multiple currencies.

To add a foreign currency price for an item revision, the user must enter this required information:

- Company to which the foreign currency price applies.

- ID of the foreign currency.

- Date on which the foreign currency price becomes effective.

- Price amount in the foreign currency, or leave this amount blank and use the nominal price calculated by XA.

- Unit of measure to be used for calculating the price.

The user can specify a unit of measure to be used when calculating the price of a quantity of the item revision in the specified foreign currency. After the foreign currency price has been entered, only the price amount and the pricing unit of measure can be changed.

When a user adds a foreign currency price for an item revision without entering a price, XA calculates the nominal price in the specified currency using the current exchange rate for that currency. The calculated price is based on the base price, pricing unit of measure, the current exchange rate for the currency, and any currency adjustment factor that applies to that currency. The result is the nominal price, which is the foreign currency price for the item revision in the unit of measure specified.

An item revision can have multiple prices in the same foreign currency. Each price has a date on which it becomes effective. As with revisions of the item, only one price per currency applies at any time, based on the effective date for each foreign currency price. Additionally, only foreign currency prices entered for the current item revision can be in effect. Foreign currency prices defined for another item revision are only effective when that item revision is the current item revision.

By default, the foreign currency prices for an item revision appear on the Sales card in the detailed information for that item revision along with the local currency prices defined for the revision. The Current tab shows the current base price and the foreign currency prices that are currently effective. The Local tab shows all base prices defined for the item revision. The Foreign tab shows all foreign currency prices defined for the item revision.

Recalculating foreign currency prices

Because fluctuations in exchange rates, changes to the pricing unit of measure, and other factors can require changes to prices in foreign currency, the Item Revision Foreign Prices object provides several options for updating foreign currency prices for an item revision.

Individual foreign currency price

For a single foreign currency price, you can change the price amount directly if you know the amount required for the new price.

If you prefer to have XA calculate the foreign price, you can use the Assign nominal price to foreign price button next to the Price attribute. This button action recalculates the foreign currency price and replaces the previous price with the nominal, or recalculated, price.

If you want to recalculate the foreign currency price but not replace the existing price, you can select the Calculate nominal price button next to the Nominal attribute. This action recalculates the foreign currency price and displays it as the nominal price. You can then review the recalculated nominal price and decide whether the variance between the nominal price and the price entered for the foreign currency requires a change. If you decide to change the foreign currency price, you can either enter a new amount in the Price field or use the Assign nominal price to foreign price button. If you choose to use the button, the recalculated nominal price replaces the existing price.

Multiple foreign currency prices

For situations in which you need to change multiple foreign currency prices, EPDM provides the Mass Replace Foreign Price with Nominal Price option. This option is available from the Maintain menu in the Item Revision Foreign Currency Prices object. This option recalculates the nominal price for all selected foreign currency prices and replaces the existing foreign currency price with the nominal price. For example, if the exchange rate between a local currency and another currency has increased by 10 percent since the last time the prices were recalculated, the Mass Replace Foreign Price with Nominal Price can be used to recalculate and replace the prices in that currency across all item revisions automatically.

To allow you to narrow the foreign currency prices for recalculation and replacement using this option, the Item Revision Foreign Prices object includes these subsets. You can apply one of these subsets or select specific item revision foreign prices from the Item Revision Foreign Prices list window.

| Subset	Use to…
Currency ID …	Recalculate and replace only item revision foreign prices calculated in the specified currency.
Current price	Recalculate and replace only the item revision foreign prices that are currently effective.
Item …	Recalculate and replace only item revision foreign prices for the specified item.
Variance percent …	Recalculate item revision foreign prices and only replace those prices that differ from the nominal prices by a percentage greater than or equal to the specified variance percent.

For any item revision foreign price included in the subset, the Mass Replace Foreign Price with Nominal Price option recalculates the nominal price based on the base price for the item revision, the pricing unit of measure, the current exchange rate for the currency, and any currency adjustment factor that applies to that currency. The nominal price then replaces the existing

price. If the list of item revision foreign prices does not have a subset, then all item revision foreign prices are recalculated and replaced.

Defining routings

EPDM routings, like item revisions, are linked to a site. Within a site you can define alternate routings and distinguish each variation as a version number. Routings describe the manufacturing process for an item and therefore reflect the real work centers and work sequences in a site.

Versioning lets you reflect any flexibility in your manufacturing process that might result in cost differences and time differences. You can have several test versions for a new routing or create versions to be used at a future date when work centers are retooled.
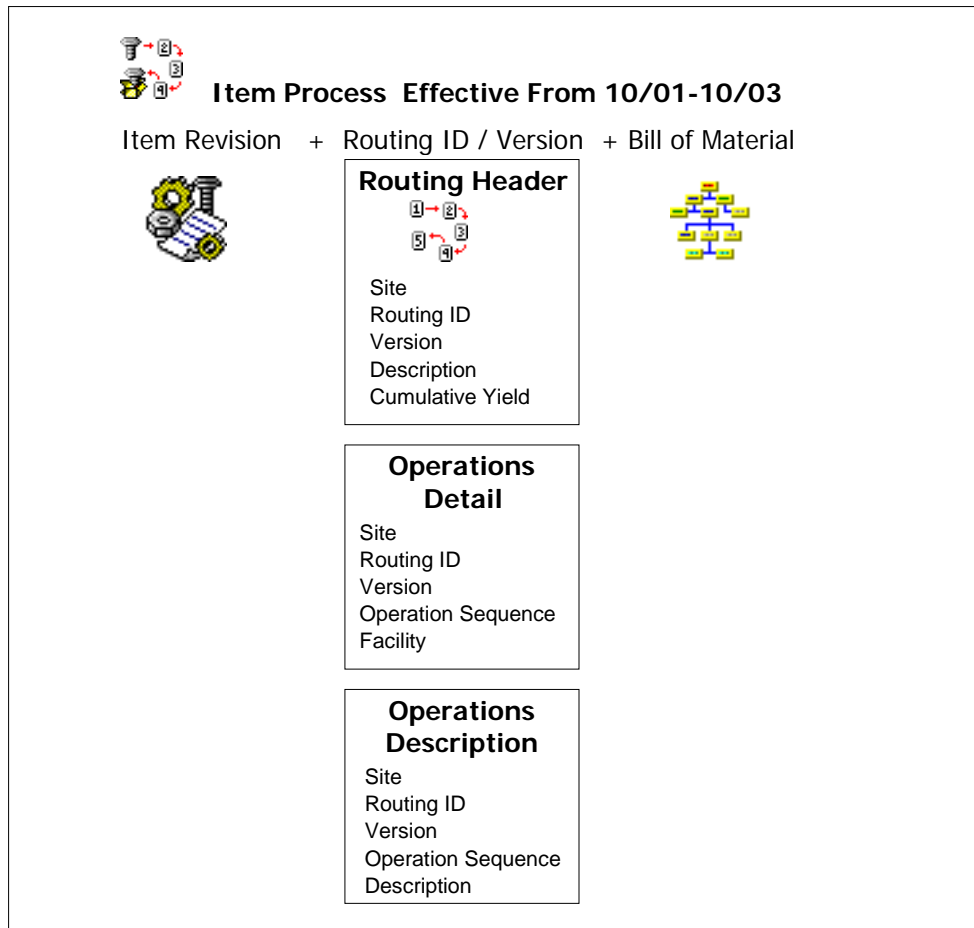
File structure

The routing record in EPDM consists of three files:

- Routing Header

- Operations Detail

- Operations Description

The routing header contains an identifying description for a routing as well as cumulative yield information. The cumulative yield is updated during routing file maintenance and allows each component's adjusted quantity to be calculated based on the routing used to manufacture the

item. The adjusted quantity is calculated as necessary for processes such as manufacturing order release.

The routing header has three key fields: site, routing ID, and version number. The routing ID is usually the same as the parent item number except when generic routings are used.

The routing operation detail and operation description files are the same as these files in PDM with the addition of the site identifier as a key field.

Routings are not differentiated by effective date since each item process that combines an item revision, bill of material, and routing has effective dates. A routing takes on the effective date of the item process it is associated with.

Generic routings

EPDM lets you use a common routing in a site as a generic routing that can be paired with all items that are manufactured using the same operation steps and with the same or close to the same operation times. Some manufacturing processes might have many products but very few routings. A routing is considered generic if it is shared by more than one item.

Routing relationships

Routing versions are closely related since they describe step by step processes that are very similar and result in identical products. This illustration shows two routing versions; one is an automated process and the second is a manual version that requires different and additional facilities (work centers)

Automated Routing

Routing Header

site ATLANTA
routing id QUA
version   001
description Automated Routing
cumulative yield 1.0

Operations Detail

site ATLANTA
routing id QUA
version 001
operation sequence 0010 0020
facility   WC01   WC01

Operations Description

site ATLANTA
routing id QUA
version 001
operation sequence 0010
description Use workcenter 24 hours a day

Manual Routing

Routing Header

site ATLANTA
routing id QUA
version   002
description Manual Routing
cumulative yield 1.0

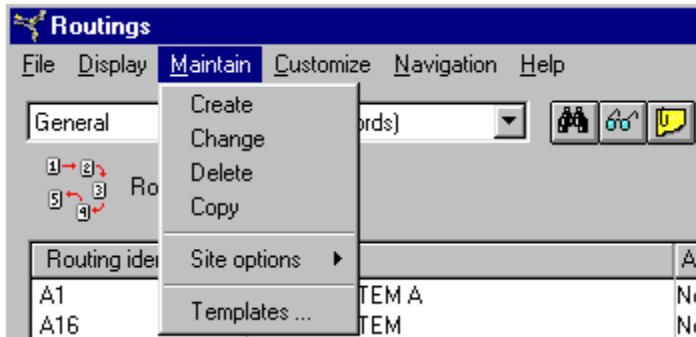**Operations Detail**

site ATLANTA
routing id QUA
version 002
operation sequence 0010 0020 0030
facility   WC02 WC02 WC03

Operations Description

site ATLANTA
routing id QUA
version 002
operation sequence 0030
description Use fixture ABC

Maintaining routings

Use the Maintain menu in Routings to create, change, delete and copy routings.

To perform a mass change of routings, use the Mass Change option on the Routing Operations Maintain menu. To navigate to the Routing Operations window, select Routing Operations from the Routings Display menu.
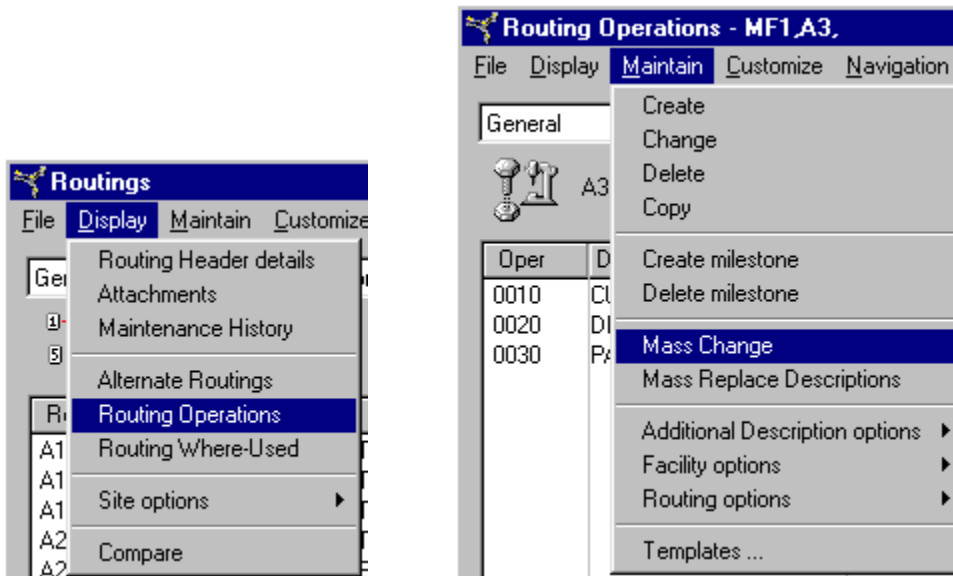
EPDM bills of material

EPDM, like PDM, stores a bill of material to record the relationship between parent items and the components that make up the items. The EPDM files are called Product Structure Header and Product Structure Detail. Like item revisions and routings, bills of materials are associated with a site in the header file. The bill of material header also contains summary information about the bill of material's description, standard batch quantity, and number of single-level components. The description is used to identify the bill of material.

In PDM, the standard batch quantity and number of single-level components are stored in the Item Master file. During migration from PDM, these two fields, SBQ and Number of single-level components, are relocated to the Product Structure Header.

The bill of material detail file gives specific information about a component: standard quantity-per and operation where used. EPDM adds component revision fields to the detail file to accommodate item revisions.

Note: If the parent item is a kit, the bill of material defines the grouping of kit component items that make up the kit parent item. Only items that meet the following criteria can be used as kit components:

- Not an APC configured item (APC item code does not equal 1).

- Not a KBC item (KBC item indicator does not equal 1).

- Not a kit parent item (item type code does not equal kit).

- Not a feature item (item type code does not equal F).

- Not an s-number item (S-number flag is blank).

- Not a service item (inventory flag does not equal 03).

Indented bills of material

Costed inquiry for an assembly is available in PDM, but only for a single-level bill of material. EPDM provides a costed inquiry for an indented bill of material. The costing elements are shown as columns next to each item in the bill. You can adjust this costed inquiry on demand by selecting the costing type (current or standard) and entering the required quantity and effective date. For end items, S-number filtering is also available to further refine the cost. This gives you the option of viewing the actual costs for the specific options or the weighted averages for all options.

Alternate bills for one parent item

A parent item can have different routings or different components. In either situation, alternate bills of material might be required. Sometimes a parent item may have more than one bill of material to distinguish more than one routing used to manufacture the item. When this is necessary, the operation where-used detail in the bill of material detail file shows the differences in the routings for the parent item. Alternate bills of material can be created to reflect different components needed when other components are unavailable. When various components are used, the component IDs and revisions in the bill of material detail file are different. EPDM assumes that a bill of material header with a blank alternate bill of material ID is the primary bill of material

The EPDM bill of material detail file only stores the standard quantity per for a component. Adjusted Quantity per (current) is calculated as needed such as during manufacturing order release, product costing at current, and MPSP and MRP planning runs. The standard quantity is stored instead of the adjusted quantity because item components in a bill can now be matched to more than one routing through the operation where used field. The calculation of the quantity per value can now be based on the actual operation.

Adjusted Quantity per (standard) is calculated when performing product costing generation for standard costs. Adjusted Quantity per (average) can be used during a simulated cost generation.

Item Process   Effective From 5/01-5/03

Item Revision   +   Routing ID / Version   +   Bill of Material
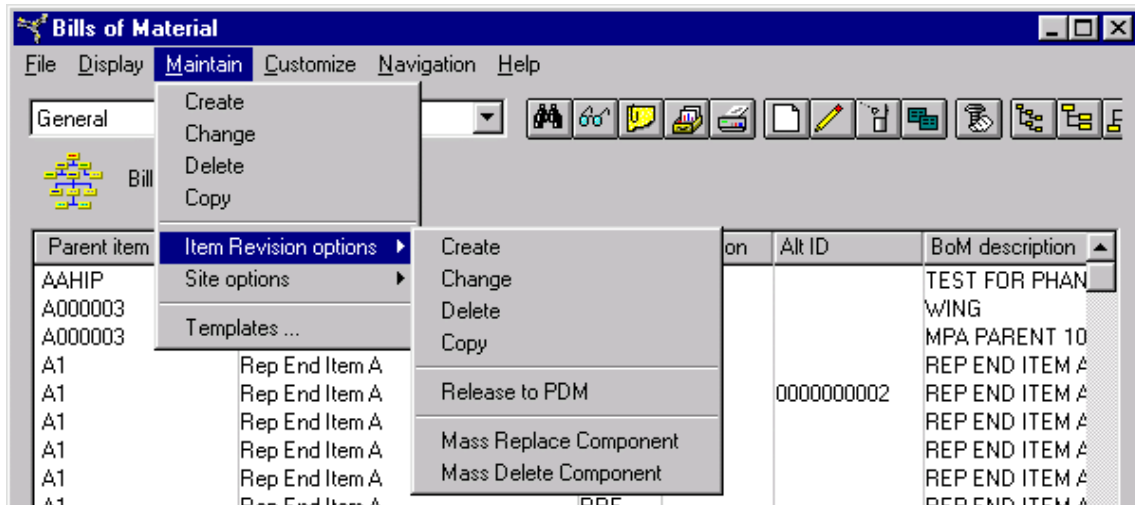
Bill of Material Header

Site
Parent item
Parent revision
Alternate BoM ID
Description
Standard Batch Quantity

Bill of Material Detail

Site
Parent item
Parent revision
Alternate BoM ID
Component
Component revision
User sequence
Operation where used
Standard Quantity Per

Maintaining bills of material

Use the Maintain menu in the EPDM Bills of Material object to create, change, delete and copy bills.


EPDM Item Processes

A routing is associated with a bill of material to create a new EPDM object: the item process. An item process is an engineering record that defines a site-item-revision bill of material and routing over a specific period of time. Item processes can be *primary* or *alternate*.

A primary process is the process used to manufacture the item. This process can change over time and is recorded by having primary processes that do NOT overlap in effective dates. Primary processes are used during manufacturing order entry and costing, and can be requested in reports or inquires that use information about bills or routings.

Alternate processes also define manufacturing for an item but their effective dates can be overlapping. Alternate processes are like primary processes except that they are not used in a product cost generation. They can be used in reporting, as overrides in releasing manufacturing orders, or in creating planned orders in MRP and MPSP. Purchased items might also have an item process so that receiving routings could be defined for the items.

Maintaining item processes

Use the Maintain menu in Item Processes to create, change, delete and copy item process records. From this menu you can open List windows to work with Bills of Material, Item Revisions, Routings and Sites. You can also choose to release the item associated with item revisions to engineering.
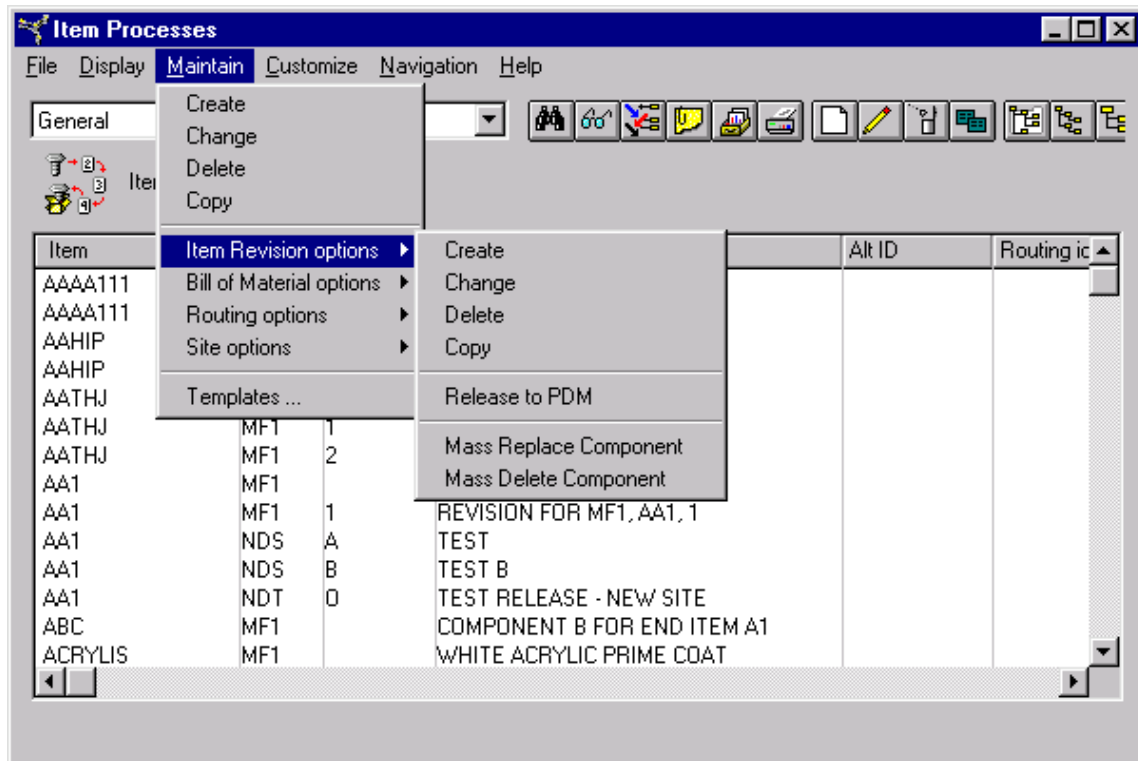
Chapter 5: Engineering Changes

Introduction

EPDM lets you control and track engineering changes. This example of a workflow shows how engineering changes can be tracked with EPDM.

1. Activate maintenance history and reason tracking.

2. Define reason codes to mark maintenance as done for a specific engineering change number. You may even rename the reason code description of the field to read "Engineering change number."

3. When changes are made, EPDM requires a reason code, and changes made to engineering records as part of an engineering change are stored in history.

4. Print a maintenance history by reason code (engineering change).

EPDM offers various copy functions to help you move engineering records through a workflow and run product costing for items. With EPDM you can copy all engineering records from one site to another. If you copy from a production to a simulation you can then analyze the information and experiment with costing. EPDM also offers a mass copy option that is similar to the add option. EPDM adds records from one site to another, but does not overwrite any existing records in the target site. If you select messaging before you begin the copy you will be alerted to the presence of duplicate records.

Copy of engineering records

EPDM gives you these mass copy functions:

- Site Copy: From production site to a new site

- Item Revision Mass Copy: From a source site to a target site

Site copy

You can copy all engineering records in a production site to a new production or simulation site. A simulation site is usually maintained in the system only temporarily. When all costing analysis and reporting is complete, you can run a site delete that deletes all records in a simulation site.

```
[Copy Site dialog box]

Copy Site                                              [X]

    [icon]  MF1   Manufacturing Site #1

  ┌ Templates ──────────────────────────────────────┐
  │ (none)                        [▼]   [ Templates... ] │
  └──────────────────────────────────────────────────┘


  ┌ Target ─────────────────────────────────────────┐
  │ Site          [MF1]    [🔍]                        │
  │ Description   [Manufacturing Site #1            ] │
  │ Simulation site   ○ Yes   ⦿ No                   │
  └──────────────────────────────────────────────────┘


  Copy item revisions, bills and routings   ☐

  ───────────────────────────────────────────────────
  ☑ Preview before copy

  [    Copy    ]    [   Cancel   ]    [    Help    ]
  ─────────────────────────────────────────── [66]
```

Item revision mass copy

The mass copy of transactions from a source site to a target site is used to copy a single-level or indented bill of material in one site and add it to another site. The bill of material is exploded and component items and all their associated records are also copied.

This copy function allows you to copy from the source site and create in the target site item-revisions records for items in a bill of material. You can choose to copy routings and their facility records and add them to the target site. Item process records can also be copied and created in the target site.

Both production and simulation sites can be sources and targets.

## Copy = cooperation and communication

Through the EPDM client, engineering departments can create, own, and copy records from department to department. For example, design engineering creates items and bills of material, and copies these records to an engineering site where routings and item processes are added. Finally, a copy can be done to a production site. The copy function is really a communication function that allows responsibility centers to cooperate and manage a design and production workflow.

**Engineering: Design to Manufacturing to Production**

1. Create items, bills of material, routings, and item processes.

<table>
<tr><td>**Design Engineering Site**</td></tr>
</table>

2. Copy all records from a design site to a manufacturing engineering site.

<table>
<tr><td>**Manufacturing Engineering Site**

Primary Process   Alternate Process</td></tr>
</table>
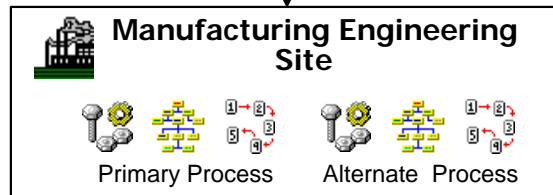
3. Copy all records from a from a manufacturing site to production sites.

<table>
<tr><td>**Production Site**

Primary Process</td><td>**Production Site**

Alternate Process</td></tr>
</table>
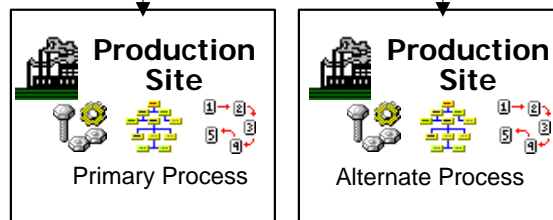
Controlling engineering records with implementation statuses

Every item revision must have an implementation status. The implementation status assigned to an item revision, and status code values contained in that implementation status, determine how Infor ERP XA processes information for that item revision. An implementation status can be assigned to more than one item revision. For example, one implementation status might be created for all items that are manufactured but not purchased, while another implementation status might be created for all purchased items.

Implementation status codes

Each implementation status contains the following status code attributes. Implementation statuses also include three status codes that users can define for their own purposes.

Release to legacy item master

The Release to legacy item master attribute indicates whether the item is available to be released to update the corresponding Item Master record. This status code corresponds to the Release to engineering code in previous releases. Note that with Release 9, this status code only controls whether the item revision information updates the corresponding Item Master record. The Release to purchasing and Release to customer status codes control whether purchase orders and customer orders can be created for the item revision.

Release to manufacturing

The Release to manufacturing attribute is used in the IM, MRP, and MPSP applications to indicate that a manufacturing order for the item can be released.

Release to purchasing

The Release to purchasing attribute controls whether a requisition or purchase order can be created for an item revision. The Procurement Management (PM) application uses this status code to determine whether a requisition or purchase order can be created for an item revision. If the Release to purchasing status is set to Yes, the purchase order creation for the item revision can proceed. If set to No, the purchase order create function cannot process the item revision.

The Release to purchasing attribute provides an additional level of control for which revision of an item is eligible for purchase. For example, if a purchased component will no longer be needed, you can assign the item revision for that component to an implementation status that has the Release to purchasing value set to No. That item is then no longer available for new requisitions or purchase orders from PM, but existing orders for the item can still be processed and inventory transactions are not affected.

Release to customer

The Release to customer attribute is used by the Customer Service Management (CSM) application to control whether a customer order can be created for an item revision. If the Release to customer status is set to Yes, the customer order creation for the item revision can proceed. If set to No, the customer order create function cannot process the item revision.

The Release to customer attribute provides an additional level of control for which revision of an item is eligible for sale to customers. For example, if an item is being replaced by a newer model, you can assign the item revision for the current version to an implementation status that has the Release to customer value set to No. That item is then no longer available for new customer orders in CSM, but existing orders for the item can still be processed and inventory transactions are not affected.

Maintain BOM

The Maintain BOM function has been expanded to include bills of material for regular items as well as for configured items. EPDM checks this status for an item revision before allowing users to maintain the corresponding bill of material. If the Maintain BOM status is set to Yes, users can maintain and change the BOM. If set to No, users cannot maintain or change the BOM.

The Maintain BOM attribute provides an additional level of control for which bills of material users can maintain. For example, bills of material for item revisions that are obsolete, current, or development versions of the item might be maintainable or might be restricted.

Maintain routing

The Maintain routing function has been expanded to include routings for regular items as well as for configured items. EPDM checks this status for an item revision before allowing users to maintain the corresponding routing. If the Maintain routing status is set to Yes, users can maintain and change the BOM for the item revision. If the Maintain routing status code is set to No:

- The routing header information cannot be changed.

- The routing operations in the routing cannot be changed. Also, no new operations can be added and no operations can be deleted.

- The ID of the routing in an item process cannot be changed. The item process cannot be changed to use a different routing ID.

An individual routing can be used for a specific combination of item/site/revision, for more than one revision of an item, or across multiple items and sites. EPDM handles the Maintain routing status code according to these rules.

- Routing without an item revision: If the routing is not associated with an item revision, no association exists to an implementation status, so maintenance of the routing is allowed.

- Routing associated with a single item revision: If the implementation status for the item revision has a Maintain routing value of Yes, the routing can be maintained. If the Maintain routing attribute has a value of No, the routing cannot be maintained.

- Routing associated with multiple item revisions: If the routing is associated with multiple revisions of one or more items, and the Maintain routing value in the implementation statuses associated with all of the item revisions is Yes, the routing can be maintained. If the Maintain routing value in an implementation status associated with one or more of the item revisions is No, the routing cannot be maintained.

- Routing ID in an item process: The Maintain routing value also controls whether the Routing ID in the item process can be maintained. If the implementation status for the item revision associated with the item process has a Maintain routing value of Yes, the Routing ID can be maintained. If the item process is for an item revision with an implementation status that has the Maintain routing status set to No, the Routing ID cannot be changed.

Implementation statuses provided by Infor ERP XA

Because Release 9 requires all item revisions to have an implementation status value, Infor ERP XA provides two implementation statuses to be used as default statuses for existing item revisions that do not have an implementation status value and for new item revisions created without an implementation status value.

(ALL): This implementation status is the default implementation status assigned to non-configured item revisions. Initially, all of the status codes for this implementation status are set to Yes. At Release 9, this implementation status is assigned to any existing, non-configured item revisions that do not have an implementation status and to any new non-configured item revisions created with an implementation status of (blank).

(CFG): This implementation status is the default implementation status assigned to configured item revisions. Initially, all of the status codes for this implementation status are set to Yes except Maintain bill of material and Maintain routing. At Release 9, this implementation status is assigned to any existing, configured item revisions that do not have an implementation status and to any new configured item revisions created with an implementation status of (blank).

The (ALL) and (CFG) implementation statuses are specified as default implementation status values in the Application Settings object for the Enterprise Product Data Management application. The default implementation status values can be changed from (ALL) or (CFG) to user-defined implementation statuses. However, any implementation status specified as a default cannot be deleted.

Mass release

In some situations, you might want to release multiple items to PDM. If you have just installed XA, you might want to load your item data into EPDM, then release all of it to PDM at one time. If you are already using EPDM, you might have an engineering change that affects more than one item. In these situations, you want to update PDM with multiple item revisions and the associated item process information at one time, instead of one item at a time.

The Mass release option in the Item Revision object gives you a way to update information for multiple items in PDM at one time. This update is important for keeping the item data in EPDM and PDM synchronized.

If you want to use an engineering change number to select item revisions for mass release, you need to enter that number in the Implementation Status field or in a user field in each item

revision affected by the change. You can then use the Implementation Status field or the user field to subset item revisions by the engineering change number. This subset allows you to release only those item revisions that were affected by the engineering change. If you need to ensure that engineering change numbers are valid before processing the release to PDM, use the Implementation Status field.

Chapter 6: Costing

Introduction

Costing is the process of determining how much various products and their components cost, based on cost elements as labor, machine, and overhead rates, as well as material costs and overhead percentages.

Like Product Data Management, EPDM provides the ability to track both *standard costs* (based on long-term history) and *current costs* (as periodically updated). Actual cost accounting systems are offered by the PC&C and IM applications. If installed and interfacing, IM lets you roll the EPDM standard cost from the Item Revision B costing information into the unit cost default in Item Revision A at the end of the period.

You can roll current costs up to standard costs. You can define costs from the lowest level of your bills of material and roll totals up to higher levels, all the way to the parent end-item.

EPDM can run costing by Site or Item Revision, allowing you to evaluate the cost of producing an item at one site versus another, or for one item revision versus another. You can define a simulated site for planning purposes and compare its costs to an actual site. You can request a full costing run, or just a selective one, limited to specific sites or item revisions. You can calculate yield and adjusted quantity per whenever a change is made through the Routing object.

EPDM costing is highly flexible, since you can choose whether or not to include user-defined "other" cost fields in the unit cost. This granularity allows you to have a more precise view of costs in your operations. You then use the resulting data for business planning, cost control, and product profitability as input to pricing.

Using Costing Simulation, you can test the effect of changes in individual cost factors such as materials and labor. Costing simulation "what-if" analyses can now be defined and saved for future use.

The Product Cost Simulation report lets you evaluate the results of simulating current or standard costs, at this and lower levels of detail.

Product costing

What do I want to cost?

How you run costing depends upon the information you need. For example, you might use EPDM costing to answer the following sorts of questions:

- Which of my sites is the least expensive to produce my products?

- What is the cost impact of this proposed engineering change?

- What are the effects of a labor union pay increase of 2%?

- How will a 5% increase in property tax affect my bottom line?

- Should I raise prices due to a 15% increase in gasoline prices? By how much?

What decisions do I need to make?

Before you can run costing, you need to make these decisions:

- Whether to use features/options. See "Feature/option definitions" on page 111.

- Whether to turn on the Costing function. To use costing, you must turn it on, either in Application Settings or the application tailoring questionnaire. Costing is a prerequisite for running costing simulation. See "Appendix C EPDM Application Settings" on page 113.

- Whether to use facility standard efficiency to calculate costs. If you answer Yes, EPDM uses the standard efficiency value in the Facilities object for costing calculations. If not, it uses a value of 1.00 (100%).

- Which values to use in estimating costs. A number of costing elements are available in the codes and options for Sites, Item Revisions, Routings, Bills of Material, and so on. These settings determine how EDPM performs product costing and costing simulations. See "Understanding product costing" for details.

- How to organize costing simulation results. When you run product costing and costing simulation, you group various costing elements into up to four summary categories. These summary categories are displayed on screens and reports. You can define these categories and their cost elements in EPDM Application Settings.

Understanding product costing

Product costing is a tool used to determine the costs to manufacture goods or sell services. EPDM lets you establish, maintain, and simulate two types of product costs: *current* and *standard*. You can choose to use current costs only, standard costs only, or both.

You can determine current and standard costs at any time, but it is customary to update current costs frequently during the fiscal year (to closely approximate actual costs) and update standard costs at the end of the fiscal year. See "Rolling costs from current to standard" on page 70 for details.

Product costing is performed from within a site for all or a subset of item revisions linked to it, or it is performed for individual item revisions. Product costing calculations are based on these costing elements:

- **Material costs**--The raw material costs for an item.

- **Outside operation costs**--The costs of any outside operations needed in the manufacturing process.

- **Purchase overhead costs**-- The overhead costs per unit for purchased parts for an item.

- **Setup labor costs**--The costs of direct labor time required to set up an operation.

- **Run labor costs**--The costs of direct labor time to run an operation.

- **Manufacturing overhead costs**—The cost of capital equipment and other indirect labor expenses.

- **Setup machine costs**-- The costs of setting up the machines used in an operation.

- **Run machine costs**-- The costs of operating the machines used in an operation.

- Up to four **optional costing elements** you can define for your own use.

Costing elements can be defined for both this-level and lower-levels. *This-level costs* are costs that occur at one level in the product structure. *Lower-levels costs* are costs that occur below this level—at lower levels in the product structure. The sum of these costing elements at both this-level and lower-levels make up an item revision's unit cost.

Values for these costing elements are either entered by you manually (M) or calculated (C) by the system. The chart below shows which elements are manually entered, calculated, and not applicable for

Manufactured, Purchased and Special item types. When both methods are possible, see "Appendix B: Costing calculations and feature/option definitions" on page 103.

Current and Standard Costs	Manufactured	Purchased	Special
This-level material cost	C	M	M
This-level outside operation cost	M/C	M	M/C
This-level purchase overhead cost	C	C	C
This-level setup labor cost	M/C	M/C	M/C
This-level run labor cost	M/C	M/C	M/C
This-level manufacturing overhead cost	M/C	M/C	M/C
This-level setup machine cost	M/C	M/C	M/C
This-level run machine cost	M/C	M/C	M/C
This-level other 1 cost (optionally)	M	M	M
This-level other 2 cost (optionally)	M	M	M
This-level other 3 cost (optionally)	M	M	M
This-level other 4 cost (optionally)	M	M	M
Lower-level material cost	C	N/A	N/A
Lower-level outside operation cost	C	N/A	N/A
Lower-level purchase overhead cost	C	N/A	N/A
Lower-level setup labor cost	C	N/A	N/A
Lower-level run labor cost	C	N/A	N/A
Lower-level manufacturing overhead cost	C	N/A	N/A
Lower-level setup machine cost	C	N/A	N/A
Lower-level run machine cost	C	N/A	N/A
Lower-level other 1 cost (optional)	C	N/A	N/A
Lower-level other 2 cost (optional)	C	N/A	N/A
Lower-level other 3 cost (optional)	C	N/A	N/A
Lower-level other 4 cost (optional	C	N/A	N/A

Costing codes

This section discusses a number of codes used in product costing. Your settings for these codes control how the system performs costing calculations. You will find many of these codes on printed product costing and costing simulation reports.

Item type code (ITC)

The item type code characterizes an item. It controls whether a product structure can be added to an item and what cost elements are calculated. These codes are:

> **0-** Phantom
>
> **1-** Assembly or subassembly
>
> **2-** Fabricated item
>
> **3-** Raw material
>
> **4-** Purchased item
>
> **9-** User option (Special)
>
> **F-** Feature
>
> **K-** Kit

The system costs various item types differently:

- *Manufactured items* (types 1 and 2) are assemblies, subassemblies, and fabricated items. They have labor, machine, manufacturing overhead costs, and possibly outside operation costs. Manufactured items have a product structure and may have lower-level costs. If they have a routing, routing times and facility rates can be used to calculate labor, machine, and manufacturing overhead.

- *Purchased items* (types 3 and 4) are raw materials or items you have purchased. They have this-level material, purchase overhead, and normally no labor costs. Purchased items have no structure and consequently no lower-level costs. You can add a receiving routing, but routing times and facility rates cannot be used in calculations.

- *Special items* (type 9) are those that do not easily fall into a make or buy category. The unit cost is the sum of this-level components. No lower-level costs are rolled up.

- *Features* (type F) without components have no associated costs. For features with components, costs are represented as a percentage of the whole. See "Feature/option definitions" on page 111.

- *Kits* (type K) cannot have a product structure or exist within one. These items are not costed in EPDM.

Cost technique code (CTECH)

The cost technique code identifies the costing method used to calculate an item's this-level costing elements. Use this code to determine the sources of costing.

> **Blank** – EPDM doesn't calculate costs. It uses the cost elements entered for Item Revision.
>
> **T –** EDPM uses the costing rates and percentages, plus labor hours from Item Revision to calculate run labor and manufacturing overhead, regardless of item type. The formulas are:
>
> - This-level setup labor cost = zero.
>
> - This-level run labor cost = labor hours (from item revision) x labor rate (from labor overhead).
>
> - This-level setup machine cost = zero.

- This-level run machine cost = zero.

- This-level manufacturing overhead cost is equal to labor hours times the overhead rate, or this-level run labor cost times overhead percent.

R – EDPM uses routing hours and production facility rates to calculate run labor, setup labor, run machine, setup machine, and manufacturing overhead.

These items are summed and stored in the item revision. Calculated values replace any values you may have entered during file maintenance. Operation yield affects calculated costing elements. The standard efficiency of the work center is also included if you answered *Yes* in EPDM Application Settings to the question "Calculate cost using facility standard efficiency."

Notes for cost technique code R:

- The item type code may *not* be 3, 4, F, or K.

- Routing and Facility information must be installed and the item must have an active routing.

- The routing for the primary item process is used to calculate labor and overhead-related costs.

Manufacturing overhead code

Manufacturing overhead calculations depend upon the manufacturing overhead code specified in the facility where each operation is performed. Manufacturing overhead is typically used to capture the cost of capital equipment and other expenditures.

This-level manufacturing overhead costs are calculated as shown below:

Blank - Zero

A - Machine cost x Overhead percent

B - Labor cost x Overhead percent

C - Machine time per unit x Overhead rate

D- Labor time per unit x Overhead rate

Time basis code (TBC)

The time basis code, defined in Routing, allows the routing time to be defined as the time to make a specified quantity of the item. The routing time is factored by its time basis code to calculate the run labor and run machine costs per unit.

Blank - Hours per unit

C - Cost per unit

H - Hours per lot

M - Minutes per unit

P - Pieces (units) per hour

1 - Hours per 10 units

2 - Hours per 100 units

3 - Hours per 1,000 units

4 - Hours per 10,000 units.

Notes:

If the time basis code is H (hours per lot):

- If you are running product costing, EPDM does not adjust the machine and labor run hours in the Routing object with cumulative yield.

- Since a lot can be for any quantity, product costing calculates cost based on a standard lot size. The time not adjusted assumes order quantity is equal to standard lot size.

If the time basis code is P (pieces per hour), run time represents the quantity per hour.

If the time basis code is C (cost per unit):

- For outside operations, the cost is stored in a separate outside operation cost field, and so the setup and run times are used by AVP, PCC and SCM scheduling, based on the prime load code and assuming the time basis code is equal to Blank.

- For outside operations, the system calculates cost for the operation and places it in the outside operation cost in Item Revision. No efficiency is considered.

- For outside operations, the system uses the outside operation cost field as the operation cost; it does not use a Facility setup or run rate. But it can use Facility overhead code (A or B) and percent to calculate overhead cost.

Recost flag (RCST, RF)

The system uses the Recost flag to identify an item that needs to be recosted.

Blank - The item does not need costing.

C - The item needs current costing.

S - The item needs standard costing.

B - The item needs current and standard costing.

N - This is a new item and needs current and standard costing.

O - This is a new item and needs current costing.

P - This is a new item and needs standard costing.

The recost flag indicates that a change has occurred since the last full product costing run (all records) and that the item cost basis has changed, as well as the cost of any parent that uses the item. For example, the flag is set by updates to routing operation yields, recalculation of cumulative yield, or recalculation of adjusted quantity per.

An item is considered "new" if it was created after the last full product costing run.

This flag does not change the cost status code, as explained below, in any way.

Cost status code (STATUS)

The system uses the Cost Status Code to show the status of an item's costs (current and standard) after product costing. Use this code to determine internal consistency.

Blank - All costs are complete.

D - The item's product structure, routing, or both are inconsistent with its item type.

T - Some of the item's this-level costs are inconsistent with its item type.

L - Some of the item's lower-level costs are inconsistent with its item type.

Examples of incomplete costs include a purchased item with no material costs or a manufactured item with no labor costs.

Notes:

- *If the cost status code is blank*, the system considers all product costs to be complete.

- *If the cost status code is D, T, or L*, the costs are incomplete. If the item has more than one condition, the highest priority code is shown. In order of priority, D is the highest, followed by T and L. This code only shows that some product costs may be missing or not needed; it does not reflect the accuracy of the costs.

The cost status code is not affected by updates, such as changes to an item's product structure, routing, or item revision. Both full and selective costing affect this code.

Entering product costs

You enter product costing labor rates, manufacturing overhead rates/percents, and purchase overhead percents by site. Each costing table is displayed as a card in the Site object. When you copy a site, you can optionally copy any or all of the costing tables to the new site.
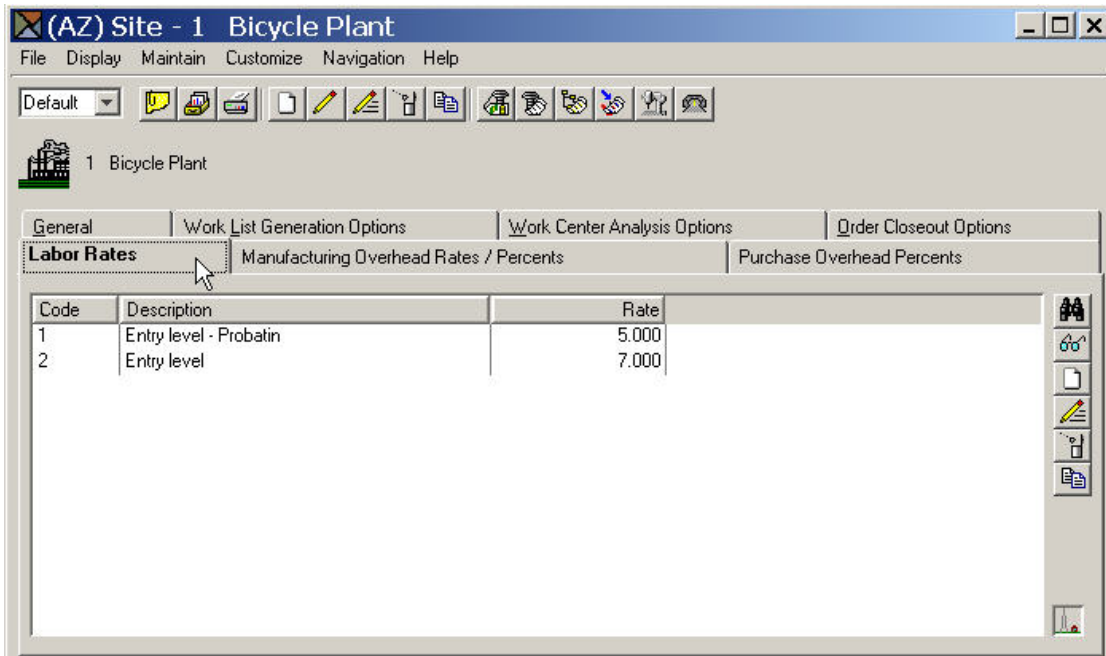
Other cost elements are maintained in their respective objects—Item Revisions, Routings, and Facilities.

Running product costing

You can run product costing as a host job from either Site or Item Revision. You have the choice of running it for current costs, standard costs, or both. You also have the option of using the same subset criteria and sorts used on list cards.
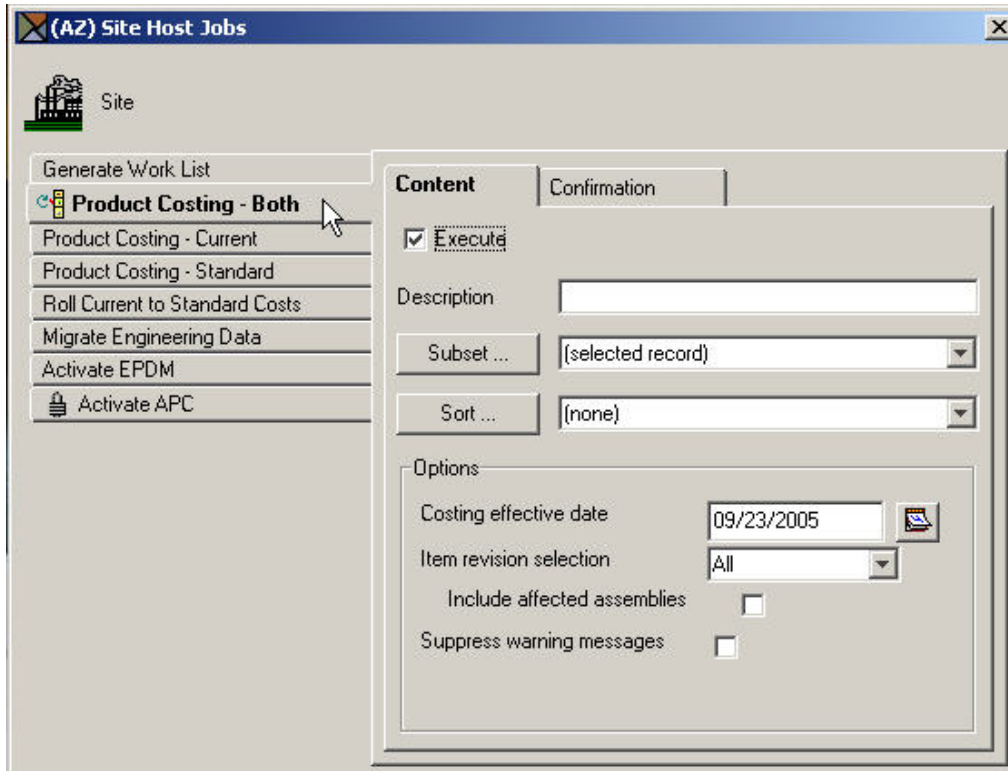

You can specify how you want the host job to be run. First you specify the "Costing effective date" that determines what item revisions and item processes are costed, based on their effective dates. Next, in "Item revision selection", you choose whether want all items, or only selected items, costed.

- *Full costing* (All) runs product costing for all selected item revision records. Full costing is the default for both sites and item revisions.

- During a full costing run, the system calculates the current costs, standard costs, or both, for all items. Full costing starts by calculating the costs for the lowest level items. They are rolled up into the higher level (parent) item's costs until the costs for the end items have been calculated. If both current and standard costs are calculated, the Recost flag is set to blank. If only current or standard costs are calculated, the Recost flag shows which cost type still must be run.

- *Selective costing* (New or Incomplete cost) runs product costing for only new items or only those with incomplete costs. It does not change the current or standard costs of items whose costs have already been established.

- Selective costing is used to incorporate corrections to items that were improperly costed when full costing was last run. You can correct the cost elements that are flagged as missing or not needed. It allows you to correct any errors and recalculate the cost of every item that was affected by your correction.

The Item Revision object keeps track of the dates when items were last costed. The dates are updated each time you perform a full or selective costing run.

Using the option *Include affected assemblies*, you can automatically recost the parents of a recosted item, and then recost of the parents of those items, all the way up the where-used chain. This saves you the steps of performing follow-on cost runs for all the upper-level assemblies.
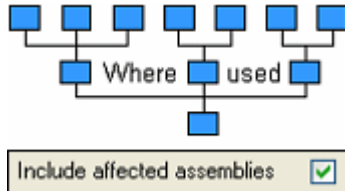
The effect of any cost changes is reflected in each higher-level parent above it with a non-blank cost status code. For example, parent item X consists of items A and B. Both A and B have non-blank cost status codes, so the status of parent item X is *L* (lower-level costs are inconsistent…). If A and B are recosted so that their status codes then become blank (costs are complete), and if *Include affected assemblies* is selected, then X is also recosted, and its status code is also changed to blank.

Any cost change is reflected as far up a product structure as is permitted by the cost status code in the structure above the change.

An easy way to fix errors indicated by the cost status code is to print the Indented Cost Sheet report (AMEG72) for the parent item. Check the Recost flags and the Cost status codes to determine which items need to be corrected and selectively recosted.

Calculating unit costs

Unit costs for all items are recalculated during product costing or costing simulation by a two-step process.

1. The system first calculates this-level costs for all items with a cost technique code of *T* or *R*.

2. The system then "rolls up" costs, starting at the lowest product structure level, using the costing elements entered manually or calculated for item revisions in the previous step.

A cost roll-up begins with the items with the largest (lowest) low-level code in any product structure. The system calculates costs for lower-level setup labor, run labor, setup machine, run machine, and manufacturing overhead costs.

The system then calculates the material and purchase overhead costs for the item. It accumulates the material and purchase overhead costs for purchased components for this-level material and purchase overhead costs for the manufacturing item. The system then accumulates all material costs and purchase overhead costs for manufactured components into this-level purchase costs for the manufactured item.

Next, the system calculates the unit cost for the item by summing this-level and lower-level cost elements, such as setup labor, run labor and so on.

The component cost printed on EPDM reports is always calculated. It is the sum of material costs and purchase overhead this-level and lower-levels, plus the sum of setup and run labor, setup and run machine costs, and manufacturing overhead lower-levels.

Finally, when the item's unit costs have been calculated, the system compares the elements making up the cost with the item's type code. On costing reports, it prints messages such as these for any missing costing elements or those not needed for the item type:

```
W AM-4859 NO ROUTING AND CTECH = R

W AM-4867 THIS-LEVEL AND LOWER LEVEL PURCHASE IS 0

W AM-4874 THIS-LEVEL OVERHEAD IS ZERO OR NEGATIVE

W AM-4875 THIS-LEVEL LABOR IS ZERO OR NEGATIVE
```

Special items

The system handles roll-ups for special items with a type code of *9* differently. For special items, the unit cost is the sum of this-level elements only (material costs, calculated purchase overhead, setup and run labor costs, setup and run machine costs, manufacturing overhead, and components). Purchase overhead is calculated based on the Purchase Overhead code and manually entered material costs.

- *If the item's cost technique code is R*, the system calculates setup labor, run labor, and manufacturing overhead from the routing. If the item has outside operations costs, they also are included in the item's unit cost.

- *If the cost technique code is T*, it calculates these costs from labor override rates.

- If *the cost technique is blank*, you manually enter these costs.

Features and options

For items with an item type code of F (Feature), the system determines the contribution of an individual option to the feature's cost by using the percentage of that option in the cost roll-up factor in the product structure. You have these choices:

- If only the base product contain costs for options (not the feature and the end item), you can use zero for all cost roll-up factors.

- If the feature and the end item contain costs of a "most standard" or "minimum" product, choose one option per feature. Assign it a cost roll-up factor of 1 and set the other options a factor of zero.

- You can split the cost among options in a feature according to expected usage. For example, a three-option feature might have cost roll-up factors of .50, .25, and .25. The Any combination should add up to 1.0 or less. Be sure that that the total of the factors represents the cost you want to include for that feature.

- EPDM issues a warning message whenever the total of the cost roll-up factors exceeds 1.0. This condition is allowed to occur because if you use engineering effectivity dates to phase in a new replacement option item, the sum of the factors (include both old and new options) might legitimately exceed 1.0.

Negative quantities

Negative quantities are allowed for use in more accurate calculations of end item cost. They are carried along with the end item as details in manufacturing material detail (MODATA). However, components with negative quantities do not update manufacturing allocation in item balances during manufacturing order release. Therefore, these components are not considered by planning after manufacturing order release has occurred. The system only updates manufacturing allocations in IM with components having a positive quantity per. The pick list, however, shows the "netted" quantities for that component.

Rolling costs from current to standard

With EPDM product costing, you can roll costs from current to standard at any time from within the Site object. Usually a company rolls up the costs from current to standard at the end of a fiscal year.
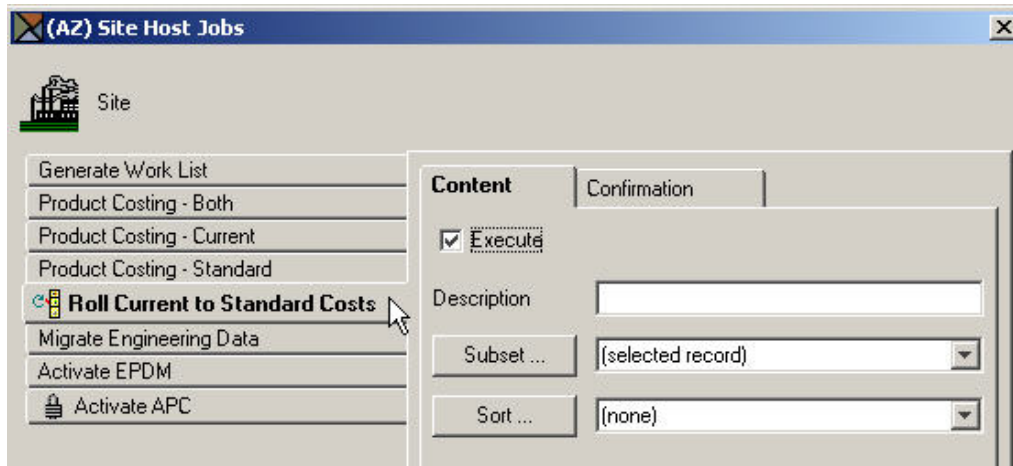
Using simulated sites for costing

The copy function that allows you to copy all engineering records from site to site, also allows you to create a simulation site for use in costing. All engineering records in a production site can be copied to the cost simulation site, changed, and rolled up without affecting the production site engineering records. When the cost simulation data is complete, you should delete the simulation site with all simulation records.

EPDM does not provide for copying field information selectively from a simulation site to update records in another site. If you want to copy an engineering record from a simulation site to a production site, or change costs, you can write a program to move the desired fields or interpret the engineering history file and create offline file maintenance transactions to be applied to the source site file.

Be sure that you run a baseline costing when you first copy the records into the site. Then, after changes are made, a costing run provides accurate variances.

Euro currency considerations

If your company has converted from a euro-participating local currency to euro currency, the costing amounts in the Item Revision, Routing Operations, and Production Facility objects may be slightly changed. These changes would be due to minor differences in the way euro amounts are rounded versus the way amounts were rounded in the local currency.

If your company has converted your local currency to euro, you must perform a full costing run for either Current or Standard costs or both types of costs. The costing run will rebuild your costs using the detailed cost amounts that were converted to euro.

Costing reports

EPDM provides these costing reports:

- Cost Variations – Current to Standard

- Indented Cost Sheet – Current or Standard

- Item Revision Costs – Current Costs or Standard Cost

- Management Cost Summary – Current or Standard

- Operations Cost Sheet – Current or Standard

- Single Level Cost Sheet – Current or Standard

- Work-in-process – Cost Worksheet

You request them as host print jobs from Item Revision. When requesting a report, you can use subsets and sort options to specify the data to appear on it.
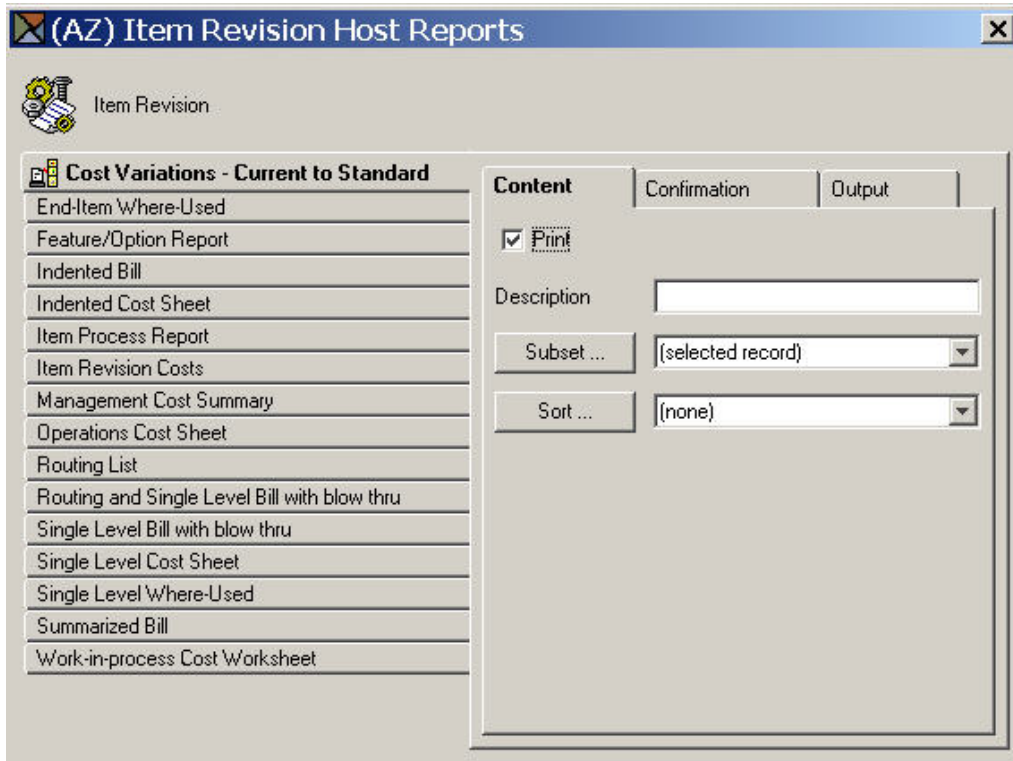

```
NORTHCREEK IND.      COST VARIATIONS - CURRENT TO STANDARD       DATE 11/28/**  TIME  9.39.22  PAGE  1    AMEH8
                     FROM-9   TO-999999999999999

ITEM NUMBER    COST CODES     --------------UNIT COSTS--------------       BASE PRICE     ---GROSS MARGIN %---
   DESCRIPTION RF CC SC U/M I/C  I/T     CURRENT        STANDARD       CURRENT     STANDARD
                     -------------------------------------V A R I A T I O N-------------------------------------
            PURCHASE CONTENT     PUR-OVERHEAD CONTENT     LABOR CONTENT     LAB-OVERHEAD CONTENT    TOTAL VARIATION
90-01240     LB 90    3          .25500000             .21830000          .294      13.27      25.75
   STS,.020X48X96,RAW
                TL            .03670000             .03670000
                LL
90-01340     LB 90    3          .23150000             .23150000          .312      25.80      25.80
   STS,.026X48X100,RAW
                TL
                LL
90-01440       LB 90   3          .24500000             .23060000          .311      21.22      25.85
   STS,.032X48X100,RAW
                TL            .01440000             .01440000
                LL
```
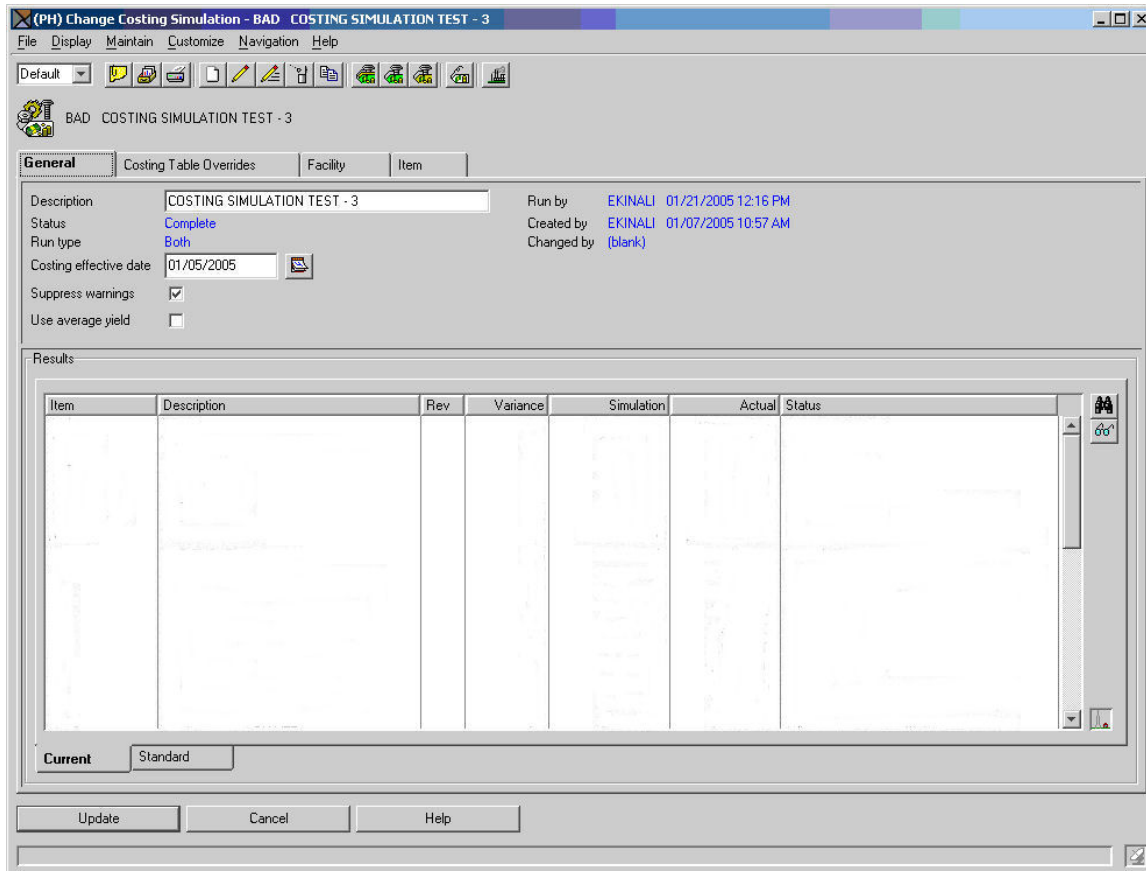
Costing simulations

EPDM cost simulations perform "what-if" costing analyses for selected item revisions and sites. They are like costing play areas that allow you to try various costing schemes to see what the impact would be. Each site can have multiple costing simulations created for it.

PDM costing simulations are not persistent and only support certain types of overrides. Combining different types of overrides in a single simulation is not allowed. With EPDM, costing simulations persist and combine multiple overrides; any and all can be used in a single simulation run.

Creating a costing simulation

Costing simulations are now objects that can be defined, saved, run, and then rerun as many times as you like. You start by creating a new costing simulation. After selecting the site whose costs you want to simulate, you first define some basic values.

Then you determine which values you want to override for the simulation.

- Labor costing table

- Manufacturing overhead costing table

- Purchase overhead costing table

- Facility class

- Facility

- Item class

- Item revision

For example, suppose you want to see the effects of a $1.00 per hour increase in labor costs. You would override the appropriate labor code from its original rate to an override rate.

General	Costing Table Overrides	Facility	Item			

Code	Description		Orig rate	Ovr rate	
A	Labor $5.00/hour		5.000		
B	Labor $7.00/hour		7.000		

Labor	Manufacturing Overhead	Purchase Overhead	

Note that costing codes have now been expanded to include values A-Z, as well as 0-9, allowing you to define additional codes.

Another costing simulation example might be a 5% expected increase in plant management salaries. You would override the original manufacturing overhead code and rate with an override rate.

General	Costing Table Overrides	Facility	Item			

Code	Description	Orig %	Ovr %	Orig rate	Ovr rate	
H	Hourly wage	0.00		0.000		
S	Salaried	0.00		0.000		

Labor	Manufacturing Overhead	Purchase Overhead	

Facility overrides can be applied on a priority basis, from the most specific to the most general. For example, you can specify overrides to a specific facility, or more generally to a class of facilities, and finally you can even provide global overrides affecting all facilities. Notice that you can view information for all facility classes and facilities, or limit your view to only those with overrides.

The same is true for item revisions. You can apply an override to specific item revisions, or more generally to an item class, and globally to override all item revisions. Again, you can view information for all item revisions, or just those with overrides.
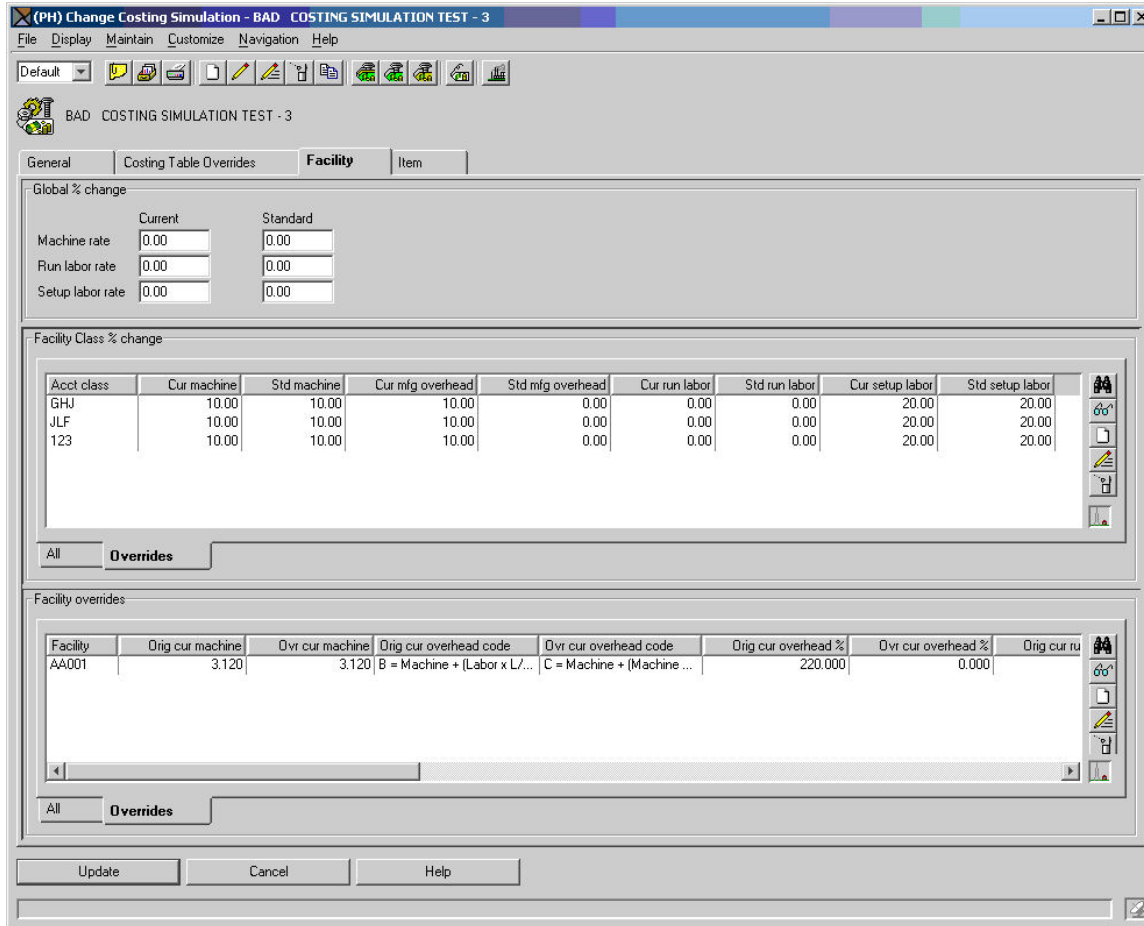
Running a costing simulation

After entering overrides, you request the host job to be run. You can select either current or standard cost simulation, or both.
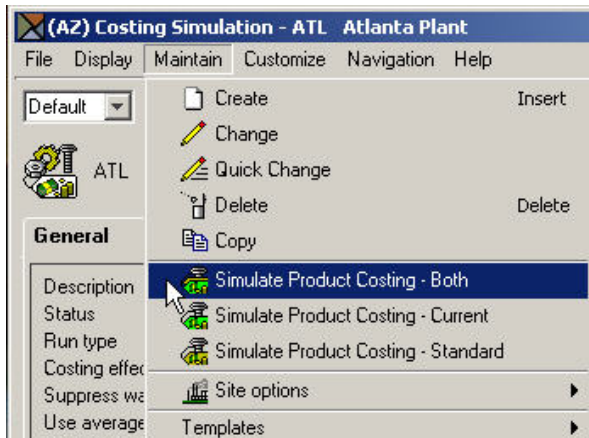
The results of your request are generated and can be accessed in two ways: the Costing Simulation Results card and Product Cost Simulation report AMEI31.

Costing simulation results

After running a costing simulation, the costing simulation results are displayed on its General card. The data is displayed by Item Revision and separated into Current and Standard result tabs, depending upon which type of simulation costing run you requested. By default, only item revisions with costing changes (having a Variance value) appear on the list, but you can customize this.

When you open the Costing Simulation Results associated with an individual Item Revision, Current results are displayed on one card, standard results on another. The screen below shows the layout of current results.

The Costing Simulation Results card contains the results of a costing simulation for this Item Revision. In *Total*, the system displays the total current or standard actual unit cost and the total simulated cost, plus the percent of variance between them.

In *Detail*, the system displays a breakout of costs, both this-level and lower-level, by the eight costing elements, plus any additional costing elements you defined and the percent of variance between the actual and simulated costs.

Finally in *Summary*, the system presents a breakout of total costs by each of the summary costing categories you defined in EPDM Application Settings.

You also see costing simulation result details and summary on the Product Costing Simulation report (AMEI31)

Product Cost Simulation – Current or Standard (AMEI31)

Report AMEI31 prints automatically at the end of a costing simulation run. The body of the report prints detailed information by item.

```
                         PRODUCT COST SIMULATION              DATE  9/07/05  TIME 13.25.47  PAGE   1  AMDI31
                         CURRENT AND STANDARD COSTS           OPER               RETRIEVAL DATE  9/06/05  HH
                                                              SITE  JF1 LAST CURRENT SIMULATION   9/06/05
                                                                        LAST STANDARD SIMULATION  9/06/05
                               -------------THIS LEVEL---------------      ------------LOWER LEVEL-------------
                                    AS-IS              SIM              AS-IS               SIM
                         UNIT COST:  STD AS-IS      2677.90780000 STD SIM      2678.28049000   VAR PCT   .0
         ITEM  MPA101      MPA ASSEMBLY 101            REV           DRAWING              UM EA   TYPE  2   CLASS MPA1
RECOST                     Purchase             8.28000000           8.28000000           .00000000           .00000000
STATUS                     Pur-overhead         9.97000000           9.97000000           .00000000           .00000000
C TECH R                   Labor               72.60000000          82.13810000           .00000000           .00000000
STD BATCH QTY     1.000 Lab-overhead           8.71200000           9.85657200           .00000000           .00000000
                         UNIT COST:  CURR AS-IS     99.56200000 CURR SIM     110.24467200   VAR PCT 10.7
                           Purchase             8.28000000           8.28000000           .00000000           .00000000
STATUS                     Pur-overhead         9.97000000           9.97000000           .00000000           .00000000
                           Labor               72.60000000          82.13810000           .00000000           .00000000
                           Lab-overhead         8.71200000           9.85657200           .00000000           .00000000
                         UNIT COST:  STD AS-IS      99.56200000 STD SIM     110.24467200   VAR PCT 10.7
         ITEM  MPA102      MPA ASSEMBLY 102            REV           DRAWING              UM EA   TYPE  2   CLASS MPA2
RECOST                     Purchase            11.93000000          11.93000000           .00000000           .00000000
STATUS                     Pur-overhead        10.10900000          10.10900000           .00000000           .00000000
C TECH R                   Labor              182.60000000         206.58810000           .00000000           .00000000
STD BATCH QTY     1.000 Lab-overhead         284.08600000         321.41369100           .00000000           .00000000
                         UNIT COST:  CURR AS-IS    488.72500000 CURR SIM     550.04079100   VAR PCT 12.5
                           Purchase            11.93000000          11.93000000           .00000000           .00000000
STATUS                     Pur-overhead        10.10900000          10.10900000           .00000000           .00000000
                           Labor              182.60000000         206.58810000           .00000000           .00000000
                           Lab-overhead       284.08600000         321.41369100           .00000000           .00000000
                         UNIT COST:  STD AS-IS     488.72500000 STD SIM     550.04079100   VAR PCT 12.5
                         ** WARNING MESSAGES HAVE BEEN SUPPRESSED **
```

The conclusion of the report summarizes simulated labor and purchase overhead by code.

```
                         PRODUCT COST SIMULATION                 DATE  9/07/05  TIME 13.25.47  PAGE  13  AMDI31
                         CURRENT AND STANDARD COSTS              OPER                RETRIEVAL DATE  9/06/05  HH
                                                                 SITE  JF1 LAST CURRENT SIMULATION   9/06/05
                                                                           LAST STANDARD SIMULATION  9/06/05
                                  LABOR/OVERHEAD SIMULATION TABLE

       ------------------ LABOR --------------------      -------------------------- OVERHEAD --------------------------

       CODE  RATE      CODE  RATE       CODE  RATE       CODE  RATE/PERCENT   CODE  RATE/PERCENT    CODE  RATE/PERCENT
        0    10.000          .000             .000        A    110.000 %            .000                  .000
        1    11.000          .000             .000        B    120.000 %            .000                  .000
        2    12.000          .000             .000        C    130.000 %            .000                  .000
        3    13.000          .000             .000        D    140.000 %            .000                  .000
        4    14.000          .000             .000        E    150.000 %            .000                  .000
        5    15.000          .000             .000        F     60.000 %            .000                  .000
        6    16.000          .000             .000        G     70.000 %            .000                  .000
        7    17.000          .000             .000        H     80.000 %            .000                  .000
        8    18.000          .000             .000        I     90.000 %            .000                  .000
        9    19.000          .000             .000        J    100.000              .000                  .000
             .000            .000             .000              .000                .000                  .000
             .000            .000             .000              .000                .000                  .000
                   LAST MAINTAINED      9/06/05                  9/06/05
                              PURCHASE OVERHEAD SIMULATION TABLE
                    OVERHEAD                OVERHEAD                OVERHEAD                OVERHEAD
             CODE   PERCENT      CODE       PERCENT     CODE       PERCENT     CODE
              A     11.00         0         100.00                  .00                     .00
              B     12.00         1         110.00                  .00                     .00
              C     13.00         2         120.00                  .00                     .00
              D     14.00         3         130.00                  .00                     .00
              E     15.00         4         140.00                  .00                     .00
              F      6.00         5         150.00                  .00                     .00
              G      7.00         6          60.00                  .00                     .00
              H      8.00         7          70.00                  .00                     .00
```

```
I        9.00       8       80.00                      .00                    .00

J       10.00       9       90.00                      .00                    .00

         LAST MAINTAINED      9/06/05

                  CURRENT ITEMS SIMULATED        47

                  STANDARD ITEMS SIMULATED       47
```

Chapter 7: Offline EPDM

Introduction

You can maintain engineering records interactively on the client, through offline maintenance, or through the Computer Assisted Drawing (CAD) Interface on the server. Select Enterprise Product Data Management from the XA Main Menu on the System i.

The Enterprise Product Data Management host main menu has five options:

- Costing

- File Maintenance

- Migrate PDM engineering records

- Computer Assisted Drawing (CAD) Interface

- Activate configurator

Refer to the *PDM User's Guide*, *Chapter 5 Costing* for more information about option **1 Costing**.

With option **2 File Maintenance** you can add, change, and delete engineering records in these EPDM files:

- Site Master

- Item Enterprise

- Item Revision

- Item Process

- Facility Master

- Product Structure Header

- Product Structure Detail

- Routing Header

- Routing

- EPDM Control File

This chapter gives more information on file maintenance and record layouts.

See "Chapter 2: Installation Considerations" on page 18 for more information about option **3 Migrate PDM's engineering records**, which can also be requested from the client.

Option **4 CAD interface** has a dual function: you can translate and load bill of material and item revision information in XA formats and AutoCAD* Drawing Extract formats (DXX).

The CAD Interface Offline load of XA formatted bills and items saves time. It functions much like the mass copy of an indented bill of material on the client side. For example, when you use the CAD interface to load a Bill of Material file, EPDM automatically creates the Bill of Material Header and Item Process records. Doing the same Offline load through Option **2 File Maintenance** would require separate steps for each type of record.

You can also use the Computer Assisted Drawing (CAD) interface to translate and load bill of material information that has been exported from the AutoCAD program in DXX (Drawing Extract Format). You can define other file formats in the CAD interface import driver. You can write programs to receive incoming files and load them to EPDM. This chapter gives more information about how to use the CAD interface. Press **F1** for Help as you work with Offline file maintenance and the CAD interface.

Offline file maintenance

Use EPDM Offline file maintenance to add, change, and delete records in EPDM files in batch mode. This maintenance updates many of the same files that are maintained interactively through the EPDM client.

When you want to view the file layout of the EPDM information base, use the CAS (Cross Application Support) **Reports** function to print the file record layouts.

This table lists the physical file names that CAS requires when you are viewing and printing the EPDM offline file maintenance files and the CAD interface import driver file.

File	File name
Site Master	SITMSTX#
Item Enterprise	ITMENTX#
Item Revision	ITMRVAX#
	ITMRVBX#
	ITMRVCX#
Facility Master	FACMSTX#
Bill of Material Header	PSTHDRX#
Bill of Material	PSTDTLX#
Routing Header	RTGHDRX#
Routing	RTGOPRX#
CAD interface import driver	IFADRV

For more information on the offline file maintenance functions available in EPDM, see "Appendix A: Offline file load and data entry" on page 91.
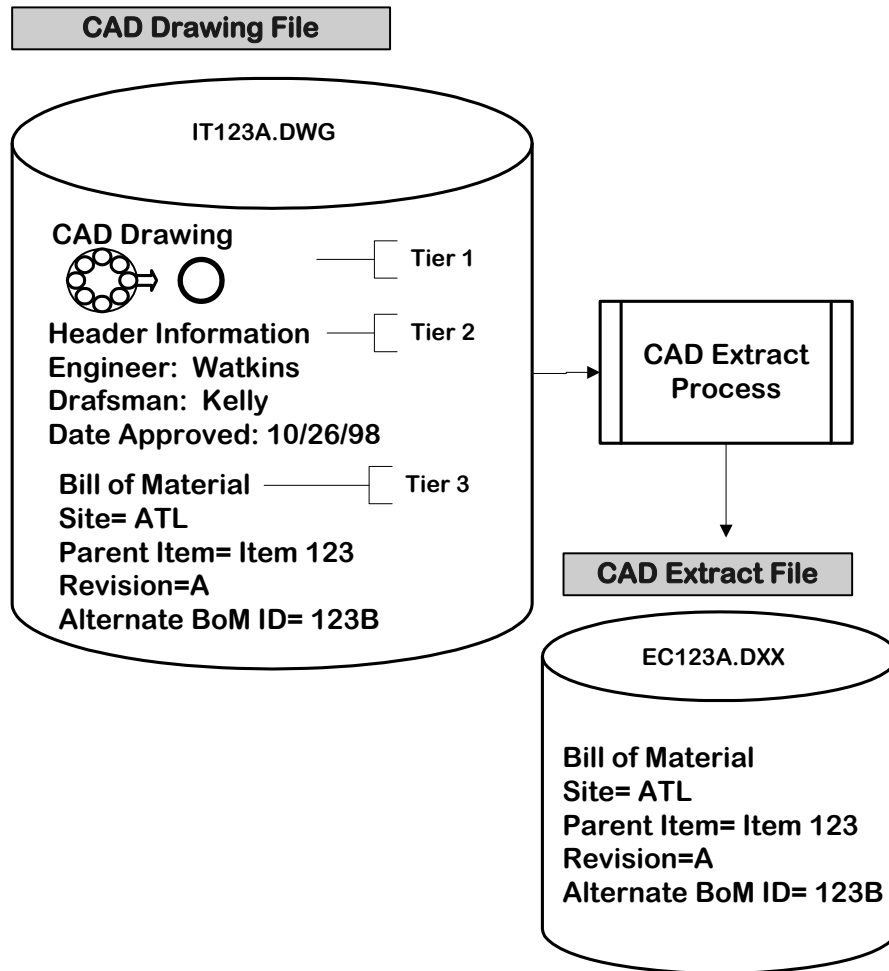
CAD interface

EPDM introduces a way to import information from AutoCAD documents. You can extract the bill of material information from a design engineering library of CAD documents and load it to the EPDM information base. You can make the file load easier by tailoring the CAD information for EPDM --adding site, revision and alternate bill of material information into the CAD document. Or you can work with the files in the CAD interface function before they are loaded to EPDM and add the site, revision and alternate bill of material information. The CAD interface also loads item revision and bill of material information in EPDM format. The CAD interface is an alternate way of loading engineering records from another kind of system to the EPDM information base.

What the EPDM CAD interface expects from the CAD extract file

The AutoCAD drawing files have a three-tiered structure: Drawing, Header Information, and Bill of Material Information. When a CAD drawing is extracted, the output is a drawing extract file with a file extension of DXX. What remains in the extract file is the third tier of information: the Bill of Material.

This illustration highlights the CAD extract process on the PC.

CAD extract attributes read by the CAD interface program

The CAD interface program expects and can read these attributes in the CAD extract file:

- ALTID   Alternate Bill of Material ID

- CINBR   Component Item Number

- CITRV   Component Item Revision

- EDATM   Effective From

- EDATO   Effective To

- ENGCH   Engineering Change Number

- ITDSC   Description

- ITTYP   Item Type

- OPWFU   Operation Where Used

- PINBR   Item Number

- PITRV   Item Revision

- QTYPR   Quantity Per

- STID   Site

- UNMSR   Unit of Measure

- USRSQ   User Sequence.

These identifying attributes can be included in the Bill of Material information in the original AutoCAD drawing file. When they are extracted and the extract file moved to the System i MAPCAD library, the CAD interface isolates each attribute and translates it for file maintenance to the EPDM database.
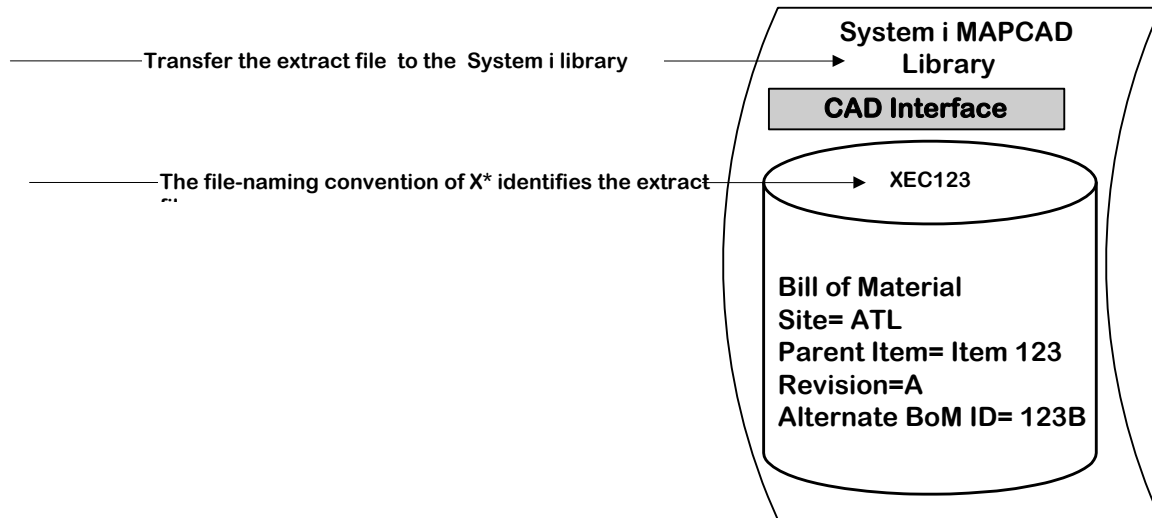
Transfer to the System i library

The CAD drawing program operates in the PC world of file extensions. The System i doesn't see these extensions, so the EPDM CAD interface relies on a file naming convention that can signal the type of file as well as trigger programs to process. Plan meaningful file names so that the list of file names on the System i lets you know what is in the file.

EPDM delivers six import drivers that "look for" six first characters in the file names to identify the type of information in the incoming file. You can change these naming conventions by editing the import driver and the drill down and translation programs that process the incoming files.

You move the output **DXF** or its summary **DXX** file to the designated library and it appears on the EPDM CAD interface screen as an incoming file. The CAD Interface processes the incoming files and creates the required transactions for an Offline load to EPDM.

This diagram illustrates the CAD extract file on the System i.

Transfer the extract file to the System i library

The file-naming convention of X* identifies the extract file.

System i MAPCAD Library

CAD Interface

XEC123

**Bill of Material
Site= ATL
Parent Item= Item 123
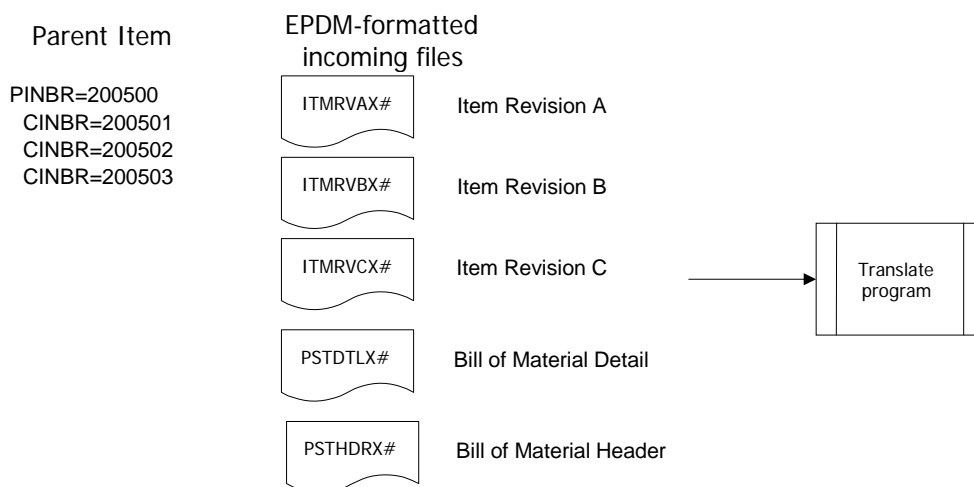Revision=A
Alternate BoM ID= 123B**

What the EPDM CAD interface expects from the EPDM-formatted files

The CAD interface has translation programs to load Bill of Material and Item Revision information to the EPDM database. Five of the delivered drivers handle these five types of EPDM records: Item Revision A, B, and C files, and Bill of Material Header and Detail files. The CAD interface driver "sees" these files as complementary and works with them as one package of information. The sixth driver is for the CAD extract file, which was discussed previously.

The two most important files are the Item Master A file and the Product Structure of Bill of Material detail file. If you only activate the Bill of Material Detail driver, the EPDM CAD Interface translation program can translate and load all of the other types of records from the Bill of Material Detail file. The other file types, though "invisible" on the System i screen, are processed when you activate the Bill of Material Detail driver. The Item Revision A file is required by the CAD Interface program if only item revision information is being loaded. The B and C files are optional.

This illustration shows what information is translated in the incoming files and loaded to EPDM.

Parent Item

EPDM-formatted incoming files

PINBR=200500
CINBR=200501
CINBR=200502
CINBR=200503

ITMRVAX#   Item Revision A

ITMRVBX#   Item Revision B

ITMRVCX#   Item Revision C

PSTDTLX#   Bill of Material Detail

PSTHDRX#   Bill of Material Header

Translate program

The CAD interface translation

Once the file is in the interface library, follow these steps to complete the translation.

1 Select option 1 Work with incoming files.

2 Choose edit or edit and load for an incoming file or files.

3 Translate program edits and translates files.

4 Select option 2 Work with translated files.

5 Correct errors & send files (status=ready) to offline load.

Working with the EPDM CAD interface

Choose option **4 CAD interface** on the EPDM main menu to display the CAD interface functions:

- Work with incoming files.

- Work with translated files.

- Define Import drivers.

Start with option **3 Define the import driver** to view the CAD interface programs delivered with EPDM. EPDM delivers six standard drivers. If you have files that do not match one of the standards, you can create your own driver and enter the definition on the import driver screen. These are the programs that translate and load DXX or DXF (AutoCAD extract) and formatted Bill of Material and Item Revision records. You also use option 3 to activate or deactivate programs in the CAD interface import driver. You can choose to deactivate a driver and thus exclude files with names that follow the naming convention for that driver from being displayed on the **Working with incoming files** screen.

When you want to customize the CAD interface to process files in other formats, use DFU (Data File Utilities) to edit this import driver (IFADRV). Add additional records for the file types that your new programs translate along with the names of the new programs you created.

The import driver

The *import driver* is a record that defines and controls how EPDM processes imported files. Each type of imported file has one record in the import driver. EPDM delivers three import driver processes for the three types of imported files below: .

- CAD extract files

- EPDM Bill of Material Header and Detail files

- EPDM Item Revision A, B, and C files.

It is recommended that you process files by engineering change. All records for one engineering change can be placed in files using the driver naming convention specified in the Driver Record Layout table. If your files come from a CAD system and the engineering change number is in the record layout, CAD processing automatically picks up the engineering change number as the reason code. If the engineering change number is not in the DXX or DXF data, the file name is used as the reason code. When reason tracking is turned on, these reason codes must be in EPDM's Reason Master file before the transactions can be successfully processed.

Viewing the import driver

Select Option **3 Define import driver** to view the import driver and information about each import file handler.

File type indicates the file types delivered by the product and the object shows the file-naming convention that must be maintained for EPDM to recognize the type of file.

| **DXF, DXX** | CAD | X X* |

		*	
PSTDTL	Bill of Material Detail	P *	P*
PSTHDR	Bill of Material Header	H *	H*
ITMRVA	Item Revision A	A *	A*
ITMRVB	Item Revision B	B *	B*
ITMRVC	Item Revision C	C *	C*

Desc is a brief descriptive name for the type of format that is supported by the import file.

Objects to include lists the file naming conventions for the objects and the name of the XA library where the objects (files) reside.

Library lists the name of the System i library where the incoming files are placed.

Drill Down Programs run if an import file has a blank file description. This program drills down through the file to find the first engineering change number or parent item number and uses it to identify the engineering record. This description appears in the **Text** field for incoming programs.

Translate Programs translate an import file into an EPDM common file format and define methods for view, delete, and translate.

Display incoming file indicates if the driver is active or not. This is the field that you change when you enter **1** for Activate/De-activate in the **Opt** field.

Work with incoming files

Select Option **1 Work with incoming files** to view a list of incoming files and to process information in the files. Files are listed if they meet the criteria set out in the driver, meet naming conventions, and are in the MAPCAD library.

Before you select an action to perform on a file, you can enter information that is assigned to all records in the file:

- Site ID

- Alternate Bill of Material ID

- Revision.

This information may already be in the CAD extracted files if it is present in the original CAD drawing file.

```
[24 x 80]                                                    _ □ ✕

File  Edit  Transfer  Appearance  Communication  Assist  Window  Help

◀  [PrtScrn]  [Copy]  [Paste]  [Send]  [Recv]  [Display]  [Color]  [Map]  [Record]  ▶

Date  7/29/97          Work with Incoming Files           AMDIFA12    MA

Default site . . .:  ___
Alternate BoM ID:  _____        Choose to update these values
Revision . . . . .:  _____     ◀─   and enter them before you select
Reason code  . . .:  _____      files and options.

Type options, press ENTER.
1=Edit only   2=Edit and load   4=Delete   5=View
Opt  File name  File type   Date    Time    Text_____
 _   X 1234     *DXF       051497  111616  ENGCH:ECWREV00
 _   X 4236     *DXF       071897  105656  PINBR:CM5K001
 _   A 1234     *ITMRVA    070197  102817  TRANSFER1234
 _   B 1234     *ITMRVB    061797  084320  TRANSFER1234
 _   P 1234     *PSTHDR    061697  170500  TRANSFER1234
 _   H 1234     *PSTDTL    042297  182730  TRANSFER1234


Roll Up/Down    F03=Exit   F05=Refresh   F11=Job status
VB▮    a              MW                                11/002
```
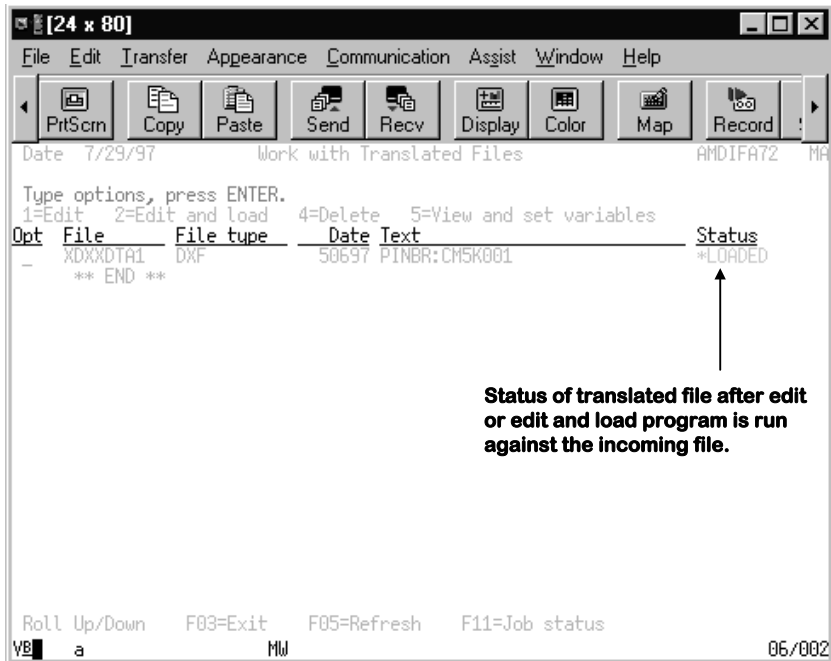
Option	Action
1 Edit	Selects and edits a file for errors against the EPDM files. Translates incoming files to an XA format. Removes the file name from the list.
2 Edit and Load	Selects and edits a file for errors against the EPDM files. Translates the incoming file to an XA format. Removes the file name from the list. If no errors, updates EPDM.
4 Delete	Deletes the file from the System i and the file list.
5 View	Displays data in the incoming file.

For DXX or DXF files, select and process each file. For offline load files, select a file and the program picks up all files associated by the naming convention.

Work with translated files

Select Option **2 Work with translated files** to view and work with translated files. You can see a status for each file that indicates the outcome of the edit or edit and load processes. The status can be:

- **Ready**   Error free and can be processed by the Edit and Load option.

- **Errors**   Errors present that must be corrected before loading to EPDM.

- **Loaded**   Updated to EPDM.

- **Update**   In process of being updated to EPDM.

- **Change**   Variables have been changed in the file.

Status of translated file after edit or edit and load program is run against the incoming file.

Option	Action
1 Edit	Selects and edits a file for errors against the EPDM files. Translates file to an XA format. Removes file name from the list.
2 Edit and Load	Selects and edits a file for errors against the EPDM files. Translates file to an XA format. Removes file name from the list. If no errors, updates EPDM.
4 Delete	Deletes the file from the System i and the file list.
5 View and set variables	Displays the file and allows you to correct the errors and update values.

Appendix A: Offline file load and data entry

Introduction

As an alternative to entering master file or transaction data interactively using XA, you can prepare the information offline in files on a separate system. The files that you create or update offline can then be loaded into the system and processed by XA. Offline files can be created on a diskette or written to a disk file. For disk offline file load, the disk file resides on the System i system, but outside of XA. For diskette offline file load, you enter records into a file created on a floppy, or flexible, disk. The same format requirements apply to both..

To use data from offline files in XA, you must:

- Gather the information to be entered, then create a file with the information on diskette or disk. The file must follow the corresponding file layout. See "Viewing and printing EPDM file record layouts" on page 92 for instructions for obtaining the file layout.

- Load the offline files by selecting a menu option.

This appendix describes these activities and files.

Creating an offline file

You can create offline files on diskette or disk. You can create the files in several ways. For example:

- You can create the records with a user-written program on an offline data entry device, and write them to a disk or diskette file.

- You can have another system create the records on tape using the required file layout. You copy the tape to disk or diskette.

- You can have a remote location send the records via telecommunications. You can write them to a disk or diskette file.

It does not matter how or where the records originate. As long as they reside in a disk or diskette file that has the defined file layout, the product can process them.

File format

You can print a copy of the file record layout. The layout gives you the following information for each maintainable field:

- A brief description of the field

- Whether the field is alphabetic or numeric (signed or packed) (**A/S/P**)

- The starting position of the field in the record (**Start**)

- The length of the field

- For numeric fields, the number of decimal positions in the field (**Dec**)

- The short field name (6 characters)

File name

Assign a special name to each file, or use the default name listed here. You must enter the name when you load the file.

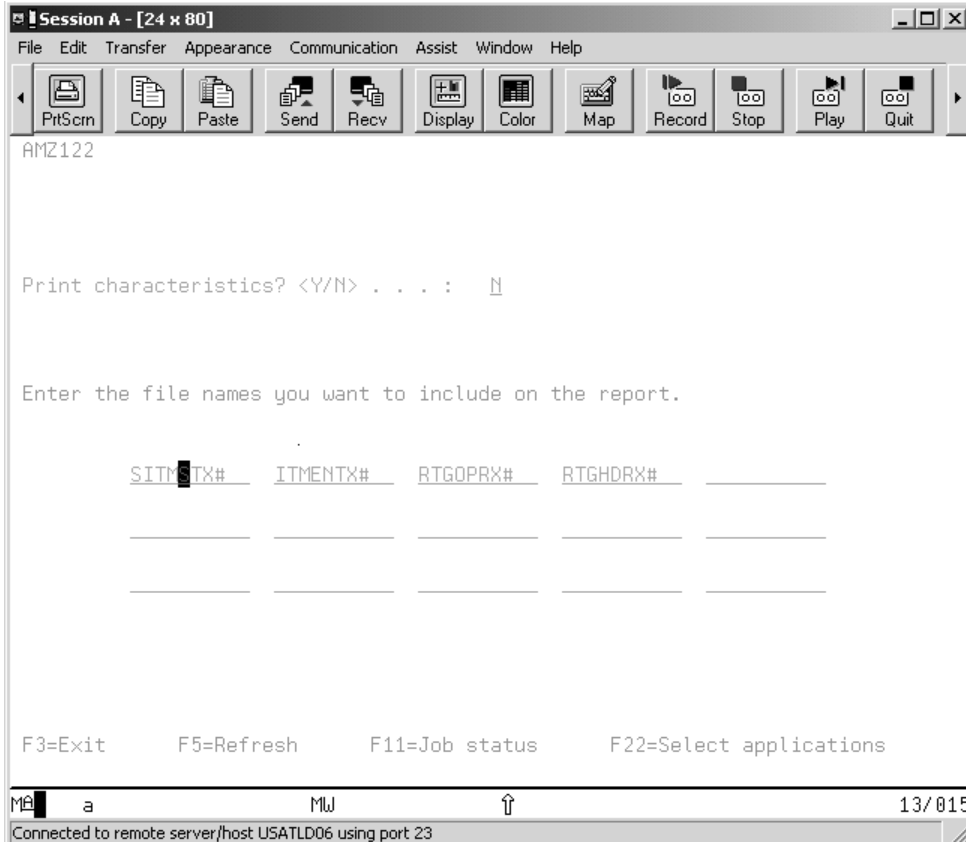| Master file to be loaded or updated	Offline file name (default)
Site Master file	SITMSTX#
Item Enterprise file	ITMENTX#
Item Revision file—A record	ITMRVAX#
Item Revision file—B record	ITMRVBX#
Item Revision file—C record	ITMRVCX#
Facility Master file	FACMSTX#
Product Structure Header file	PSTHDRX#
Product Structure Detail file	PSTDTLX#
Routing Header file	RTGHDRX#
Routing file	RTGOPRX#
Item Process file	ITMPRCX#

If you want to translate and load bill of material and item revision information in XA formats and AutoCAD* Drawing Extract format (DXX), use the following offline file name.

File to be loaded or updated	Offline file name (default)
CAD interface import driver file	IFADRV

Viewing and printing EPDM file record layouts

Use Cross Application Support to obtain a printed version of the file record layout for the file you will be working with. See the *CAS User's Guide* for more detailed information.

1. At the CAS main menu, select option **2 Reports**.

2. At the Reports menu, select option **5 File Record Layout**.

3. To print all EPDM file record layouts, enter **1** in the option field next to Enterprise Product Data Management and press **Enter**.

4. To print only specific files, enter 1 to select EPDM and press **F22 (Shift** and **F10)**.

5. To print more detailed information, select **Print Characteristics**.

6. Tab to the entry fields and type the file names of the files you want to see and print. You must use one of the file name shown in the tables above.

7. Press **Enter**.

```
Session A - [24 x 80]                                         _ □ ×
File  Edit  Transfer  Appearance  Communication  Assist  Window  Help
 ◄  [PrtScrn]  [Copy]  [Paste]  [Send]  [Recv]  [Display]  [Color]  [Map]  [Record]  [Stop]  [Play]  [Quit]  ►

AMZ122




Print characteristics? <Y/N> . . . :    N



Enter the file names you want to include on the report.

             .

        SITMSTX#    ITMENTX#    RTGOPRX#    RTGHDRX#    _____


        _____  _____  _____  _____  _____


        _____  _____  _____  _____  _____




F3=Exit      F5=Refresh      F11=Job status      F22=Select applications

MA  a              MW                ⇧                        13/015
Connected to remote server/host USATLD06 using port 23
```

Entering information into the offline files

Regardless of what offline method you use for entering information, the information in the files must be organized in the layout shown in the file record layout. The file layout shows the fields contained in each file record in the correct sequence for offline entry.

The alphabetic/numeric column (A/N) in the layout tables contains important information for setting up the offline files. The letter A indicates alphabetic fields. Numeric fields are indicated by the letters N, S, and P. The letter N indicates a regular numeric field; the letter S represents a signed numeric field. The letter P indicates a numeric field in packed format.

All numeric fields must contain zeros or numeric data in each position. Otherwise, data decimal errors will occur and the entry will fail.

Loading offline files into EPDM

When you have finished creating the offline files, you are ready to load the information onto the system. For instructions on how to load master files from offline files, see the *CAS User's Guide*.

Entering changes and deletions

When you use offline maintenance to change or delete records, follow these guidelines:

- For required fields and fields you want to change, enter valid data. See the tables later in this appendix for the required fields in each file.

- For optional fields you do NOT want to change, you must enter all blanks with special characters:

- To enter all blanks for an alphabetic field, type all asterisks (*).

- To enter all blanks for a numeric field, type all nines followed by a minus sign (999999999-).

To delete a record, enter valid data for required fields only.

Site Master (SITMSTX#) file

The SITMSTX# file is a physical file containing site information. As a convenience, the offline load physical file SITMSTX# is provided in the AMXLIBx library (where x is the first letter of the environment you are using). If you plan to use this file to load your offline data, it is suggested that you follow these steps:

1. Make a copy of the SITMSTX# file in your own user library, using the following command:

    CRTDUPOBJ OBJ(SITMSTX#) FROMLIB(AMXLIBx) OBJTYPE(*FILE) TOLIB(your library) ADDPFM FILE(your library/SITMSTX#) MBR(SITMSTX#)

2. Using Data File Utility (DFU), establish a data entry session for the offline file and enter all of the offline transactions for the file.

3. When you have completed the DFU session, select Site Master Offline Maintenance and specify the offline file in your user library as the file to load.

The following fields are required to process a site record.

Required field	Field name	Value required		Required for
Transaction ID	TRID39	D0AB0100	Delete	All records
		D0AB0200	Add	
		D0AB0300	Change	
Reason Code	RSCD39	Reason for the maintenance		If reason tracking is on
Site identifier	STID39	Valid site ID		All records
Site description	STDS39	Description of the site		D0AB0200 only
Simulation site	SIMS39	'0' or '1'		All records
Data security group code	AA0B39	Valid security group code		D0AB0200 only

Item Enterprise (ITMENTX#) file

The ITMENTX# file is a physical file containing enterprise item information. As a convenience, the offline load physical file ITMENTX# is provided in the AMXLIBx library (where x is the first letter of the environment you are using). If you plan to use this file to load your offline data, it is suggested that you follow these steps:

1. Make a copy of the ITMENTX# file in your own user library, using the following command:

    CRTDUPOBJ OBJ(ITMENTX#) FROMLIB(AMXLIBx) OBJTYPE(*FILE) TOLIB(your library) ADDPFM FILE(your library/ITMENTX#) MBR(ITMENTX#)

2. Using Data File Utility (DFU), establish a data entry session for the offline file and enter all of the offline transactions for the file.

3. When you have completed the DFU session, select Item Enterprise Offline Maintenance and specify the offline file in your user library as the file to load.

The following fields are required to process an item enterprise record.

Required field	Field name	Value required		Required for
Transaction ID	TRID41	D0C00100	Delete	All records
		D0C00200	Add	
		D0C00300	Change	
Reason Code	RSCD41	Reason for the maintenance		If reason tracking is on
Item number	ITNO41	Valid item number		All records
Item description	ITDS41	Description of the item		D0C00200 only

Item Revision (ITMREVX#) file

The ITMREVX# file is a logical file across multiple physical files (ITMRVAX#, ITMRVBX#, and ITMRVCX#). The A record is always required. If you do not specify a B record, it is created automatically. For item type 3 and 4, the C record is created automatically unless it is entered during initial offline file load.

As a convenience, the three offline load physical files, ITMRVAX#, ITMRVBX#, and ITMRVCX#, and one logical file, ITMREVX#, are provided in a Save File called SFITMREVX# in the AMXLIBX library. If you plan to use these files to load your offline data, you can follow these steps:

1. Restore ITMRVAX#, ITMRVBX#, ITMRVCX#, and ITMREVX# to your user library, using the following command:

    RSTOBJ OBJ(ITMREVX# ITMRVAX# ITMRVBX# ITMRVCX#)
    SAVLIB(ITMREVX#) DEV(*SAVF)
    SAVF(AMXLIBx/SF ITMREVX#)
    RSTLIB(your library)
    where x is the first character of the System i product environment you are using.

2. If you are entering the data on the System i, use Data File Utility (DFU) to establish a data entry session for each of the Item Revision formats (A, B, C). Enter all data for each format (A, B, C).

If you are entering data from some other source, make sure that each position of the record has valid data according to the offline file layouts (for example, numeric fields have numeric data). If you have transferred the data to the System i by way of a record length (flat) file, you can use the copy file function (CPYF) to copy the data from the record-length file to the appropriate physical file (ITMRVAX#, ITMRVBX#, ITMRVCX#). Specify the "no check" option for the Record Format Field Mapping option (FMTOPT=*NOCHK).

3. After you have put the data into the offline physical files (ITMRVAX#, ITMRVBX#, ITMRVCX#), select Item Revision offline file maintenance and select the default file (ITMREVX#) in your user library as the file to load. The offline load process copies the data from the offline physical files and properly sequences the records by transaction ID and item number.

The following table shows an overview of the Item Revision records and the sequence in which they should be entered.

Sequence	Record	Description
1	A	General item information
2	B	Costing information
3	C	Purchasing information

Record type A: Item information (ITMRVAX#)

The following fields are required to process an item revision A-record.

Required field	Field name	Value required		Required for
Transaction ID	TRID30	D001AD01	Delete	All records
		D002AD01	Add	
		D003AD01	Change	
Reason Code	RSCD30	Reason for the maintenance		If reason tracking is on
Site identifier	STID30	Valid site ID		All records
Item number	ITNO30	Valid item number		All records
Item revision	ITRV30	Valid item revision number		All records
Item description	ITDS30	Description of the item		D002AD01 only

Record type B: Item information (ITMRVBX#)

The following fields are required for costing information. The site item number and item revision number must match the number you enter for the A record.

Required field	Field name	Value required		Required for
Transaction ID	TRID31	D001AL00	Delete	All records
		D002AL00	Add	
		D003AL00	Change	

Reason Code	RSCD31	Reason for the maintenance	If reason tracking is on
Site identifier	STID31	Valid site ID	All records
Item number	ITNO31	Valid item number	All records
Item revision	ITRV31	Valid item revision number	All records

Record type C: Item information (ITMRVCX#)

The following fields are required for purchasing information. The site item number and item revision number must match the number you enter for the A record.

Required field	Field name	Value required		Required for
Transaction ID	TRID32	D001AW00	Delete	All records
		D002AW00	Add	
		D003AW00	Change	
Reason Code	RSCD32	Reason for the maintenance		If reason tracking is on
Site identifier	STID32	Valid site ID		All records
Item number	ITNO32	Valid item number		All records
Item revision	ITRV32	Valid item revision number		All records

Facility Master (FACMSTX#) file

The FACMSTX# file is a physical file containing facility information. As a convenience, the offline load physical file FACMSTX# is provided in the AMXLIBx library (where x is the first letter of the environment you are using). If you plan to use this file to load your offline data, it is suggested that you follow these steps:

1. Make a copy of the FACMSTX# file in your own user library, using the following command:

    CRTDUPOBJ OBJ(FACMSTX#) FROMLIB(AMXLIBx) OBJTYPE(*FILE) TOLIB(your library) ADDPFM FILE(your library/FACMSTX#) MBR(FACMSTX#)

2. Using Data File Utility (DFU), establish a data entry session for the offline file and enter all of the offline transactions for the file.

3. When you have completed the DFU session, select Facility Master Offline Maintenance and specify the offline file in your user library as the file to load.

The following fields are required to process a facility record.

Required field	Field name	Value required		Required for
Transaction ID	TRID16	D0FM0100	Delete	All records
		D0FM0200	Add	
		D0FM0300	Change	

Reason Code	RSCD16	Reason for the maintenance	If reason tracking is on
Site identifier	STID16	Valid site ID	All records
Production facility ID	PFID16	Valid production facility ID	All records
Production facility description	PFDS16	Description of the production facility	D0FM0200 only

Product Structure Header (PSTHDRX#) file

The PSTHDRX# file is a physical file containing product structure header information. As a convenience, the offline load physical file PSTHDRX# is provided in the AMXLIBx library (where x is the first letter of the environment you are using). If you plan to use this file to load your offline data, it is suggested that you follow these steps:

1. Make a copy of the PSTHDRX# file in your own user library, using the following command:

    CRTDUPOBJ OBJ(PSTHDRX#) FROMLIB(AMXLIBx) OBJTYPE(*FILE) TOLIB(your library) ADDPFM FILE(your library/PSTHDRX#) MBR(PSTHDRX#)

2. Using Data File Utility (DFU), establish a data entry session for the offline file and enter all of the offline transactions for the file.

3. When you have completed the DFU session, select Product Structure Header Offline Maintenance and specify the offline file in your user library as the file to load.

The following fields are required to process the header record for a product structure.

Required field	Field name	Value required		Required for
Transaction ID	TRID37	D0CS0100	Delete	All records
		D0CS0200	Add	
		D0CS0300	Change	
Reason Code	RSCD37	Reason for the maintenance		If reason tracking is on
Site identifier	STID37	Valid site ID		All records
Product structure description	PSHD33	Description of the product structure		DOCS0200 only
Parent item number	PITM37	Valid item number		All records
Parent item revision number	PITR37	Valid item revision number		All records
Product structure description	PSHD37	Description of the product structure		D0CS0200 only

Product Structure Detail (PSTDTLX#) file

The PSTDTLX# file is a physical file containing product structure detail information. As a convenience, the offline load physical file PSTDTLX# is provided in the AMXLIBx library (where x is the first letter of the environment you are using). If you plan to use this file to load your offline data, it is suggested that you follow these steps:

1. Make a copy of the PSTDTLX# file in your own user library, using the following command:

    CRTDUPOBJ OBJ(PSTDTLX#) FROMLIB(AMXLIBx) OBJTYPE(*FILE) TOLIB(your library) ADDPFM FILE(your library/PSTDTLX#) MBR(PSTDTLX#)

2. Using Data File Utility (DFU), establish a data entry session for the offline file and enter all of the offline transactions for the file.

3. When you have completed the DFU session, select Product Structure Offline Maintenance and specify the offline file in your user library as the file to load.

The following fields are required to process the detail record for a product structure.

Required field	Field name	Value required		Required for
Transaction ID	TRID33	D0CU0400	Product structure delete	All records
		D0CU0500	Product structure detail record delete	
		D0CU0600	Detail record add	
		D0CU0700	Detail record change	
Reason Code	RSCD33	Reason for the maintenance		If reason tracking is on
Site identifier	STID33	Valid site ID		All records
Parent item number	PITM33	Valid item number		All records
Parent item revision number	PITR33	Valid item revision number		All records
Component item revision number	CITR33	Valid item revision number		All records
Component item number	CITM33	Valid item number		All records

Routing Header (RTGHDRX#) file

The RTGHDRX# file is a physical file containing routing header information. As a convenience, the offline load physical file RTGHDRX# is provided in the AMXLIBx library (where x is the first letter of the environment you are using). If you plan to use this file to load your offline data, it is suggested that you follow these steps:

1. Make a copy of the RTGHDRX# file in your own user library, using the following command:

   CRTDUPOBJ OBJ(RTGHDRX#) FROMLIB(AMXLIBx) OBJTYPE(*FILE) TOLIB(your library) ADDPFM FILE(your library/RTGHDRX#) MBR(RTGHDRX#)

2. Using Data File Utility (DFU), establish a data entry session for the offline file and enter all of the offline transactions for the file.

3. When you have completed the DFU session, select Routing Header Offline Maintenance and specify the offline file in your user library as the file to load.

The following fields are required to process the header record for a routing.

Required field	Field name	Value required		Required for
Transaction ID	TRID38	D0C30100	Routing header record delete	All records
		D0C30200	Routing header record add	
		D0C30300	Routing header record change	
Reason Code	RSCD38	Reason for the maintenance		If reason tracking is on
Site identifier	STID38	Valid site ID		All records
Routing identifier	RTID38	Valid routing ID		All records
Routing header description	RTHD38	Description of the routing		D0C30200 only

Routing (RTGOPRX#) file

The RTGOPRX# file is a physical file containing detailed routing information. As a convenience, the offline load physical file RTGOPRX# is provided in the AMXLIBx library (where x is the first letter of the environment you are using). If you plan to use this file to load your offline data, it is suggested that you follow these steps:

1. Make a copy of the RTGOPRX# file in your own user library, using the following command:

   CRTDUPOBJ OBJ(RTGOPRX#) FROMLIB(AMXLIBx) OBJTYPE(*FILE) TOLIB(your library) ADDPFM FILE(your library/RTGOPRX#) MBR(RTGOPRX#)

2. Using Data File Utility (DFU), establish a data entry session for the offline file and enter all of the offline transactions for the file.

3. When you have completed the DFU session, select Routing Offline Maintenance and specify the offline file in your user library as the file to load.

The following fields are required to process the detail record for a routing.

Required field	Field name	Value required		Required for
Transaction ID	TRID34	D0C40500	Milestone group remove	All records
		D0C40800	Routing delete	
		D0C40900	Operation record delete	
		D0C41000	Operation record add	
		D0C41100	Operation record change	
		D0C41800	Routing additional descriptions delete	
		D0C41900	Operation additional description record delete	
		D0C42000	Operation additional description record add	
		D0C42100	Operation additional description record change	
		D0C43100	Milestone group define	
Reason Code	RSCD34	Reason for the maintenance		If reason tracking is on
Site identifier	STID34	Valid site ID		All records
Routing identifier	RTID34	Valid routing ID		All records
Production Facility identifier	PFID34	Valid facility ID		All records
Operation description	OPDS34	Description of the operation		D0C41000only
Operation Sequence	OPSQ34	Sequence # for operation		All records

Item Process (ITMPRCX#) file

The ITMPRCX# file is a physical file containing item process information. As a convenience, the offline load physical file ITMPRCX# is provided in the AMXLIBx library (where x is the first letter of the environment you are using). If you plan to use this file to load your offline data, it is suggested that you follow these steps:

1. Make a copy of the ITMPRCX# file in your own user library, using the following command:

    CRTDUPOBJ OBJ(ITMPRCX#) FROMLIB(AMXLIBx) OBJTYPE(*FILE) TOLIB(your library) ADDPFM FILE(your library/ITMPRCX#) MBR(ITMPRCX#)

2. Using Data File Utility (DFU), establish a data entry session for the offline file and enter all of the offline transactions for the file.

3. When you have completed the DFU session, select Product Structure Header Offline Maintenance and specify the offline file in your user library as the file to load.

The following fields are required for an item process record. The only offline file load transaction supported for this file is the creation or addition of a new record. You cannot use the offline file load function to change or delete an item process record.

Required field	Field name	Value required		Required for
Transaction ID	TRID40	D0C10200	Record add	All records
Reason Code	RSCD40	Reason for the addition		If reason tracking is on
Site identifier	STID40	Valid site ID		All records
Item number	ITNO40	Valid item number		All records
Item revision	ITRV40	Valid revision number		All records
Description	IPDS40	Description of the item process		All records
Item revision primary alternate flag	IPPA40	1 = primary 0 = alternate		All records
Effective from date	EDAM40	Valid calendar date		Primary only

Appendix B: Costing calculations and feature/option definitions

Introduction

Current and standard costs (this level) for an item are calculated using identical formulas, based on Item Revision and Facility fields. The only difference is that current fields are used to develop current costs, and standard fields are used to develop standard costs.

An item's material, labor, machine, and manufacturing overhead content this level and setup cost per lot are calculated based on the Item type code (ITTYP) and the Cost technique code (CTECH) for the item.

If you selected to use facility standard efficiency during application tailoring, the standard efficiency factor for each facility is used to factor the machine and labor hours which are used to calculate the various cost elements for operations occurring in that facility.

Item type code = 9 (User option/Special item):

- Material this level remains the value contained in the Item Revision record

- Labor, machine, and overhead content this level are calculated the same way as for a manufactured item.

Purchased item:

- Material this level remains the value contained in the Item Revision record.

- Labor, machine, and overhead content this level are normally zero.

- Setup cost per lot remains the value in the Item Revision record.

Manufactured item:

- Material this level is calculated from bill of material components during cost roll-up.

- Labor, machine, and manufacturing overhead content this level and setup cost per lot are calculated based on the cost technique code (CTECH):

blank	Uses value entered during Item Revision maintenance
T	Calculated from labor hours and labor and overhead codes in the Item Revision object, and labor rate and overhead rate/percent in the Site object (see formulas later in this section).
R	Calculated from all active routing operations (see formulas later in this section).

Costs are affected by the following:

- Item Revision file cost fields and standard lot size.

- Quantity per in the bill of material (product structure file).

- Labor hours and labor and overhead code in the Item Revision file, if CTECH=T.

- Labor and overhead rates and overhead percents in the Site object, if CTECH=T.

- Rates/percentages or efficiencies (if you chose during tailoring) in the Production Facility file, if CTECH=R.

- Hours, amounts, yields, and setup crew size in the Routing file, if CTECH=R

- EPDM control file (defines which elements are used to compute an item's unit cost).

An item's recost flag is reset if the Item Revision, Product Structure, or Routing files are changed in the associated fields. You can recalculate an item's current or standard unit cost by running selective or full, current, standard, or both costing.

Cost formula used for material

All costs described below are "this level" costs:

Material Cost: (A + B) x (C/D)

                where:

                        A = component material

                        B = component purchase overhead

                        C = adjusted quantity per

                        D = standard batch quantity (of the parent)

Source of data used in Material cost calculations

Product Structure files:

- Standard batch quantity (parent)

- Adjusted quantity per (calculated)

Item Revision B file:

- Material (components)

- Purchase overhead (components)

You define a quantity per when you create a bill of material (during product structure file maintenance). Adjusted quantity per is calculated as needed and is not stored in any EPDM file. The yield through all previous operations is divided by the yield for all operations and that number is multiplied by the quantity per to arrive at the adjusted quantity per. Only product structure records with a current effective date are used in the calculations.

Cost formulas used when cost technique code = T

All costs described below are "this level" costs:

- Setup labor: zero

- Run labor: Labor hours (Item Revision B file) x Labor rate (Site object)

- Setup machine: zero

- Run machine: zero

- Manufacturing overhead: one of the following:

    1. Labor hours (Item Revision B file) x Mfg overhead rate (Site object), or

    2. Run labor (as calculated above) x Mfg overhead percent (Site object).

Cost formulas used when cost technique code = R

All costs described below are "this level" costs:

- **Time Basis Code**: The formulas below for run labor hours and run machine hours should be adjusted by the Time Basis Code for each operation, as follows:

Blank	Hours per unit	x 1.0	
1	Hours per 10 units	x 0.1	
2	Hours per 100 units	x 0.01	
3	Hours per 1,000 units	x 0.001	
4	Hours per 10,000 units	x 0.0001	
M	Minutes per piece	/ 60	0.016666667
P	Pieces per hour	1 / run hours	Reciprocal
H	Hours per lot	/ standard lot size	Yield is not used
C	Cost per piece	(See "Outside operations")	Outside operation

Setup Cost per Lot:

The routing operation setup cost per lot is:

$$(A \times B) + \{(A \times C) / D\}$$

where:

A = setup labor hours (adjusted by TBC factor, if TBC=M)

B = setup labor rate

C = machine rate

D = setup crew size

All active routing operations are used to compute an item's total setup cost per lot.

Source of data used in cost technique code calculations

Routing Operation file:

- Setup labor hours
- Setup crew size

Production Facility file:

- Setup rate
- Machine rate

Labor and Machine Costs

Setup Labor Cost: The setup labor cost per unit is:

$$\{(A \times B) / C\} / D$$

where:

A = Setup labor hours (adjusted by TBC factor, if TBC=M)

B = Setup labor rate

C = Standard lot size

D = Standard efficiency, (if tailored to use)

Run Labor Cost: The run labor cost is:

{(A x B) x C} / D

where:

A = Run labor hours (adjusted by TBC factor)

B = Run labor rate

C = Yield adjustment (yield through previous operations/yield all operations)

D = Standard efficiency, (if tailored to use)

Setup Machine Cost: The setup machine cost per unit is:

{(A x B) / C} / D / E

where:

A = Setup labor hours (adjusted by TBC factor, if TBC=M)

B = Machine rate

C = Setup crew size

D = Standard lot size

E = Standard efficiency (if tailored to use)

Run Machine Cost: The run machine cost is:

{(A x B) x C} / D

where:

A = Run machine hours (adjusted by TBC factor)

B = Run machine rate

C = Yield adjustment (yield through previous operations/yield all operations)

D = Standard efficiency (if tailored to use)

Source of data used in Labor and Machine cost calculations

Item Revision B file:

- Standard lot size

Routing files:

- Setup labor hours (operation)

- Setup crew size (operation)

- Run labor time (operation)

- Run machine time (operation)

- Yield through previous operations (operation)

- Yield through all operations (header)

Production Facility file:

- Setup labor rate

- Run labor rate

- Machine rate

- Standard efficiency

Note: Yield is not used if TBC=H.

Manufacturing Overhead

Manufacturing overhead calculations use the following elements, described previously:

1. Setup labor cost

2. Run labor cost

3. Setup machine cost

4. Run labor cost

Since calculations for those elements use yield and efficiency (if tailored), overhead is also affected by yield and efficiency. The following formulas apply when the TBC is not C (outside operation). For TBC=C, there is no manufacturing overhead calculated. When the TBC=C, see "Outside operations" on page 109 for information on calculating outside operation overhead.

Overhead code = A (Based on machine cost):

$$(A + B) \times C$$

where:

A = Setup machine cost

B = Run machine cost

C = Overhead percent for code A

Overhead code = B (Based on labor cost):

$(A + B) \times C$

where:

A = Setup labor cost

B = Run labor cost

C = Overhead percent for code B

Overhead code = C (Based on machine hours):

$\{(A / B / C) + (D \times E)\} \times F$

where:

A = Setup machine hours (adjusted by TBC factor, if TBC=M)

B = Setup crew size

C = Standard lot size

D = Run machine hours (adjusted by TBC factor)

E = Yield adjustment (yield through previous operations/yield all operations)

F = Overhead rate for code C

Overhead code = D (Based on labor hours):

$\{(A / B) + (C \times D)\} \times E$

where:

A = Setup labor hours (adjusted by TBC factor, if TBC=M)

B = Standard lot size

C = Run labor hours (adjusted by TBC factor)

D = Yield adjustment (yield through previous operations/yield all operations)

E = Overhead rate for code D

Source of data used in Manufacturing Overhead calculations

Production Facility file:

- Overhead code
- Overhead rate/percent

Routing files:

- Setup labor hours   (operation)
- Setup crew size   (operation)
- Run labor time   (operation)
- Run machine time   (operation
- Yield through previous operations (operation)
- Yield through all operations (header)

Item Revision B file:

- Standard lot size

Note: Yield is not used if TBC=H.

Outside operations

If the Time Basis Code (TBC) = C for an active routing operation, outside operation cost is calculated. You can enter an amount into one or both of Run machine time and Outside operation cost in Routing Operation. The base outside operation cost is the sum of the two amounts.

Overhead also can be calculated, as below, and added to the base outside operation cost amount to get the total outside operation cost for the operation..

Neither run labor, nor yield, nor efficiency is used to calculate outside operation cost.

Overhead code = A (Based on machine cost):

$$(A + B) \times C$$

where:

A = Setup machine cost (calculated as for inside operations)

B = Run machine time (used as an amount)

C = Overhead percent for code A

Overhead code = B (Based on labor cost):

$$(A + B) \times C$$

where:

A = Setup labor cost (calculated as for inside operations)

B = Outside operation amount (Run machine time + Outside operations cost)

C = Overhead percent for code B

Overhead code = C (Based on machine hours):

$$(A / B / C) \times D$$

where:

A = Setup hours

B = Setup crew size

C = Standard lot size

D = Overhead rate for code C

Overhead code = D (Based on labor hours):

$$(A / B) \times C$$

where:

A = Setup hours

B = Standard lot size

C = Overhead rate for code D

Source of data used in outside operations calculations

Routing Operations:

- Outside operation cost

- Run machine time (amount)

- Setup hours

- Setup crew size

Production Facility:

- Setup rate

- Overhead code

- Overhead rate/percent

- Item Revision B

- Standard lot size

Outside operation cost calculations

The cost for an outside operation is the sum of:

- Outside operation amount (as entered)

- Outside operation overhead (as calculated)

This cost is totaled for all outside operations into Outside operation this level in the Item Revision.

Cost roll-up logic

An item's current /or/ standard unit cost is the sum of the following fields contained in the Item Revision record:

- Current/Standard material this level and lower levels

- Current/Standard outside operations this level and lower levels

- Current/Standard purchase overhead this level and lower levels

- Current/Standard setup labor this level and lower levels

- Current/Standard run labor this level and lower levels

- Current/Standard setup machine this level and lower levels

- Current/Standard run machine this level and lower levels

- Current/Standard manufacturing overhead this level and lower levels

- Current/Standard other 1 this level and lower levels

- Current/Standard other 2 this level and lower levels

- Current/Standard other 3 this level and lower levels

- Current/Standard other 4 this level and lower levels.

The calculation of the this-level fields was discussed previously in "Cost calculations". For purchased items, and items with item type code of 9, EPDM does not roll up costs.

Cost roll-up is a technique to calculate the lower-level content fields and material this level for manufactured items whose item type code is not purchased (3 or 4) or 9.

The technique is the same for both current and standard costs, differing only in that current cost fields are used to calculate current costs and standard cost fields are used to calculate standard costs. These fields are calculated as follows:

- Material this level = sum of materials this level of all direct, active components.

- Material lower levels = sum of materials lower levels of all direct, active components.

- Labor lower levels = sum of labor contents lower levels of all components.

- Overhead lower levels = sum of overhead contents lower levels of all components.

Feature/option definitions

A *feature* represents a way for an end-item (an item which has no parents) to define optional structures of itself. Options are those structures.

Consider the (simplified) example of an automobile (Z) as an end-item.

- One of Z's direct components is a feature called Engine E. E's options are: 250 cc, 350 cc, 400 cc, and 450 cc.

- Another of Z's direct components is a feature called Color C. C's options are: Blue, Red, Yellow, and Grey.

- The rest of Z's first-level components are subassemblies, purchased parts, fabricated items, raw materials, or phantoms that do not change based on engine or color.

Only end-items can have features. End-items with features are prevented from being attached as components to higher assemblies. Features can be specified as required or non-required in the product structure relationship.

Field sizes for features/options (feature/option template)

A two-digit feature can have up to 1295 options, depending on how you lay out the feature/options field size template (feature/option template) in the EPDM application tailoring questionnaire.

End-items can have up to 20 features, depending on how many option field size questions you answered during application tailoring. There is only one feature/option template in EPDM. It has twenty elements, one position each. The only valid content of each element is a 0, 1, or 2.

The feature/option template is in a record in the SYSCTL file with the key FOTAB1. FOTAB1 is established during application tailoring, and is not maintained by application programs. The feature/option template is an array used to overlay an S-number to locate which option was selected for which feature. The S-number is a manually entered, non-stored field in which you can specify one option for each feature of the desired end-item. You enter the S-number with an end-item when requesting an inquiry or a report.

To process an S-number, FOTAB1 is retrieved and then each option number is moved serially from the left of the S-number to a work array (20 elements, 2 characters each) for the lengths specified in FOTAB1. The features start at the left with feature 1 and go to the right sequentially.

For example, if FOTAB1 = 11212 and item AX147 is a valid end-item with features, then for a product structure retrieval the following entries:

- Item AX147

- S-number 9393107.

Translate to:

- Item AX147 with

- Feature 1's Option 9

- Feature 2's Option 3

- Feature 3's Option 93

- Feature 4's Option 1

- Feature 5's Option 07

Features versus phantoms

Features can never be stocked because they physically do not exist. A feature is a logical focal point that says here is a place to look for an associated set of options, only one of which may be used.

Phantoms are not usually stocked. A phantom is a group of components that are used in many different products and are treated in each product as if they were listed individually in that product structure. When a phantom item is encountered in Inventory Management, if the phantom has a zero on-hand balance and in the single- level mode with blow-through EPDM retrieval, its components are retrieved and treated as though they were all present in the original single level bill of material.

Features can be components only on the first level of an end-item. When product costing is run, costs are rolled up for phantoms as for any other assembly.

However, since only one option at a time is possible for a feature, the feature's costs are a weighted average of all its options. This is done using the cost roll-up factor in each feature/option product structure.

Phantoms can be on any level in a product structure and can be in the structure of another phantom. EPDM supports phantoms within phantoms for 99 levels.

Features have options which are selectively retrieved using S-numbers.

Phantoms do not have options and therefore do not use S-numbers.

Appendix C EPDM Application Settings

The Enterprise Product Data Management Applications Settings window contains the General tab. It provides access to options in the EPDM control file, as well as three of the 37 questions in the EPDM application tailoring questionnaire. Use it to customize the configuration settings for EPDM activities, particularly product costing and costing simulation results. These values can be changed at any time without a dedicated system. Values changed in EPDM Application Settings update the EPDM control file or application tailoring questionnaire, and vice versa.

Note: Not all EPDM application tailoring questions are represented in application settings. For example, questions D5-D11 for features/options, D12-D34 for constants and D35-D37 for reporting must be maintained in the tailoring questionnaire. For more information, see the *Planning & Installing Guide.*

General Tab

Application Setting	Options
Default site	Which site do you want to use as your default site? This site interfaces with PDM on the host.
Activate Feature/Options	Select this field to enable the definition of features and options. A feature represents a way for an end-item (an item which has no parents) to define optional structures of itself. Features are described in the "Feature/option definitions" section in Appendix B. From Application Tailoring Questionnaire D04.
Activate Product Costing	Select for Yes, blank for No. Comparable to Question **D02** DO YOU WANT TO USE PRODUCT COSTING? DFLT-N If you want to use the product costing function, select this option. This causes Item Revision B records to be created to accommodate EPDM costing data. If you answer No, you cannot use the product costing function.
Calculate cost using facility standard efficiency	Select for Yes, blank for No. Comparable to Question **D03** DO YOU WANT PRODUCTION FACILITY STANDARD EFFICIENCY TO BE USED FOR CALCULATING STANDARD AND CURRENT COSTS? DFLT-Y If you want production facility standard efficiency to be used in EPDM product costing calculations, answer Yes. If so, EPDM uses the value from the Facility Master file. If not, EPDM uses a value of 1.00 (100%) for production facility efficiency.
Costing Summaries:	This table allows you to group various kinds of cost factors for product costing and costing simulation results. You can define up to four optional cost factors.
Summary cost 1-4	Define one to four summary cost categories for costing. (At least one must be defined.) Enter a text description. Then for each of the cost factors, click to select the single summary category to which it belongs.
Material	Select for Yes, blank for No. One of the four summary cost categories must be selected.
Outside operations	Select for Yes, blank for No. One of the four summary cost categories must be selected.
Purchase overhead	Select for Yes, blank for No. One of the four summary cost categories must be selected.

Application Setting	Options
Setup labor	Select for Yes, blank for No. One of the four summary cost categories must be selected.
Run labor	Select for Yes, blank for No. One of the four summary cost categories must be selected..
Setup machine	Select for Yes, blank for No. One of the four summary cost categories must be selected..
Run machine	Select for Yes, blank for No. One of the four summary cost categories must be selected..
Manufacturing overhead	Select for Yes, blank for No. One of the four summary cost categories must be selected.
User cost 1-4	Define up to four optional costing factors by entering a text description. Then optionally select the summary costing category to which it belongs.

Appendix D Item Revision Enablement

The charts in this section indicate the applications that use Item Revisions for item information and the functions in Power-Link options that now replace XA menu option functions.

XA applications that use Item Revisions

This chart identifies the XA applications that use Item Revisions for item information.

Application	EPDM enabled
Accounting Management Plus	Yes
Accounting Management Accounts Payable	Not applicable
APS Integration	Yes
Accounting Management Accounts Receivable	Not applicable
Cross Application Support	Yes
Customer Order Management	Yes
Capacity Requirements Planning	Yes
Customer Service Management	Yes
Enterprise Business Intelligence	No
Electronic Commerce	Yes
Enterprise Product Data Management	Yes
Financial Analysis	Not applicable
Finite Capacity Planning/Scheduling	Yes
Forecasting	No
Accounting Management General Ledger	Not applicable
Infor ERP XA iCRM	Yes
International Financial Management	Yes
Inventory Management	Yes
Infor ERP XA Browser	Yes

Application	EPDM enabled
Maintenance & Calibration Management (Maincor)	No
Infor Integrator	Yes
Materials Management	Yes
Manufacturing Performance Analysis	Yes
Master Production Schedule Planning	Yes
Material Requirements Planning	Yes
Net-Link	Yes
Order-Based Production Management	Yes
Production Control and Costing	Yes
Product Data Management	No
Procurement Management	Yes
Production Monitoring and Control	Yes
Payroll	Not applicable
Purchasing	Yes
Repetitive Production Management	Yes
Sales Analysis	No

XA legacy options replaced with Power-Link options

The functions in the XA Power-Link applications replace functions in the XA legacy applications. Replaced functions are no longer accessible. This table lists the XA legacy options that are replaced and the corresponding Power-Link option for performing the task.

XA legacy option		Replaced by Power-Link option	
Application/ Menu option	Option description	Power-Link Application/ Object	Description
PUR AM6M90, option 2	Work with Purchasing / Buyers, Sub-option 10=items	Procurement Management, Buyers object	Displays list of item revisions for a selected buyer.

XA legacy option		Replaced by Power-Link option	
Application/ Menu option	**Option description**	**Power-Link Application/ Object**	**Description**
PUR AM6M60, option 3	Vendor/Item Master	Procurement Management, Vendor Items object	Edits for Engineering number (ENGNO), Department number (DPTNO), and Alternate item (B2OEMN) no longer apply.
PUR AM6M40, option 3	Reports / Buyer Worksheet	Procurement Management, Buyer object	Customize the Buyer object to display the same information as the worksheet.
COM AMBM20, option 3	Inquiry / Items, Sub-option 65=Foreign currency prices	Enterprise PDM, Item Revision Foreign Prices object	Accessed from Item Revisions, Display menu, Item Revision Foreign Prices option. Also displayed in Item Revisions object: Sales card, Prices section, Current tab.
COM AMBM63, option 7	Pricing Maintenance / Item Foreign Currency Prices	Enterprise PDM, Item Revision Foreign Prices object	Accessed from Item Revisions, Display menu, Item Revision Foreign Prices option. Also displayed in Item Revisions object: Sales card, Prices section, Current tab.
PUR AM6M30, option 2	Inquiry / Display Item Detail	Enterprise PDM, Item Revisions object	Display menu, Item Revision details option shows detailed information for a selected item revision.

XA legacy option		Replaced by Power-Link option	
Application/ Menu option	**Option description**	**Power-Link Application/ Object**	**Description**
PUR AM6M70, option 1	File Listings / Item Master	Enterprise PDM, Item Revisions object	Item Revisions object lists all item revisions. List can be customized with views, subsets, and sorts.
PUR AM6M90, option 1	Work with Purchasing / Items, Sub-options 1=Create, 2=Change, 4=Delete, 5=Display	Enterprise PDM, Item Revisions object	Maintain menu contains Create, Change, and Delete options. Display menu contains option for viewing Item Revision details.
COM AMBM20, option 3	Inquiry / Items, Sub-option 62=Foreign language	Enterprise PDM, Item Revision Foreign Language Descriptions object	Accessed from Item Revisions, Display menu, Foreign Language Descriptions option. Also available on Descriptions card, Foreign Languages section.
COM AMBM20, option 3	Inquiry / Items, Sub-option 66=Local currency prices	Enterprise PDM, Item Revision Foreign Prices object	Accessed from Item Revisions, Display menu, Item Revision Foreign Prices option. Also displayed in Item Revisions object: Sales card, Prices section, Current tab.
COM AMBM40, option 8	Miscellaneous Reports / Item Master	Enterprise PDM, Item Revisions object	Use the Local Print option in Item Revisions to print item revision information.

XA legacy option		Replaced by Power-Link option	
Application/ Menu option	**Option description**	**Power-Link Application/ Object**	**Description**
IM AMIM10, option 1	Inquiry / Display Item Detail	Enterprise PDM, Item Revisions object	Display menu, Item Revision details option shows detailed information for a selected item revision.
IM AMIM23, option 1	File Listings / Item Master List	Enterprise PDM, Item Revisions object	Use the Local Print option in Item Revisions to print item revision information.
IM AMIM90, option 1	Work With / Items, Sub-options 1=Create, 2=Change, 4=Delete, 5=Display	Enterprise PDM, Item Revisions object	Maintain menu contains Create, Change, and Delete options. Display menu contains option for viewing Item Revision details.
COM AMBM63, option 6	Pricing Maintenance / Mass Price Changes	Enterprise PDM, Item Revision Base Prices object	Maintain menu contains Mass Change and Mass Delete options.
IM AMIM23, option 3	File Listings / Item Base Price List	Enterprise PDM, Item Revision Base Prices object	Use the Local Print option in Item Revision Base Prices to print item revision base price information.
COM AMBM6E, option 2	Offline Pricing / Offline Price Book	Customer Service Management, Price Book object and System-Link	Use System-Link XML request and response to extract or update price book information.

XA legacy option		Replaced by Power-Link option	
Application/ Menu option	**Option description**	**Power-Link Application/ Object**	**Description**
COM AMBM6E, option 3	Offline Pricing / Offline Contract Promotion	Customer Service Management, Customer Contracts and Promotion objects and System-Link	Use System-Link XML request and response to extract or update contract and promotion information.
COM AMBM6E, option 4	Offline Pricing / Offline Foreign Price	Enterprise PDM, Item Revision Foreign Prices object and System-Link	Use System-Link XML request and response to extract or update foreign price information for item revisions.
COM AMBM6E, option 1	Offline Pricing / Offline Item Base Price	Enterprise PDM, Item Revision Base Prices object and System-Link	Use System-Link XML request and response to extract or update base price information for item revisions.
COM AMBM63, option 8	Pricing Maintenance / Item Foreign Currency Price Revaluation	Enterprise PDM, Item Revision Foreign Prices	Maintain menu includes Mass Replace Foreign Price with Nominal Price option.

Glossary

bill of material	A list of raw materials or components and the quantities needed to make an item, assembly, or end product.
CAD interface	An option in offline EPDM that allows you to load bill of material information extracted from a computer-assisted drawing application, such as AutoCAD, to the EPDM database.
card	A group in a set of related information about an object, called a card file
card file	A set of related information about an object. Each set contains groups of related information, shown as a stack of tabbed index cards. Each group is a card.
DXF file format	A file format produced when a Computer Assisted Drawing program extracts detail information from a CAD drawing.
DXX file format	A file format produced when a Computer Assisted Drawing program extracts only bill of material information.
Enterprise Production Data Management	An XA client application for both single and multi-site organizations that controls and manages production information.
fit	Characteristic that allows an item to connect to or become an integral part of another item.
form	The configuration of an item such as shape, size, density, weight, or other physical properties that identify the item.
function	The use or performance of an item.
item	Any raw material, manufactured or purchased part, subassembly, assembly, or end item.
preferences	Identifies the choices you can make for which view, subset, sort, card file, or template you want to use with the current object: the last one you used, the default, or one you select from a drop-down list.

routing   A sequence of operations required to make a manufactured
                                    item.

sort   A method of identifying the order the information about objects
                                    will appear in the list window. Sorts can be ascending or
                                    descending. A sort has its own unique name and can be public
                                    or private.

subset   A method of narrowing a list of objects to a smaller list in the list
                                    window. A subset has its own unique name and can be public
                                    or private

templates   A template is used to create a new object with a set of defaults.
                                    A template has its own unique name and can be public or
                                    private. When you preview a template, it looks like card file.

view   A particular set of columns in a list window. A view has its own
                                    unique name and can be public or private.

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