QAD 2007 User Guide Volume 5
Supply Chain Management

Enterprise Operations Plan
Distribution Requirements Planning
Product Line Plan
Resource Plan

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Contents

About This Guide

This guide covers features related to Supply Chain Management in QAD 2007.

Other QAD Documentation

- For an overview of new features and software updates, see the *Release Bulletin*.
- For software installation instructions, refer to the appropriate installation guide for your system.
- For conversion information, refer to the *Conversion Guide*.
- For instructions on navigating and using the QAD .NET User Interface, see *User Guide: QAD .NET User Interface.*
- For instructions on navigating the Windows and character environments, refer to *User Guide Volume 1: Introduction*.
- For instructions on navigating and using the QAD Desktop interface, see *User Guide: QAD Desktop.*
- For information on using QAD 2007, refer to the *User Guides*.
- For technical details, refer to *Entity Diagrams* and *Database Definitions.*
- To view documents online in PDF format, see the *Documents on CD* and *Supplemental Documents on CD.*

  Note Installation guides are not included on a CD. Printed copies are packaged with your software. Electronic copies of the latest versions are available on the QAD Web site.

For a complete list of QAD Documentation, visit the QAD Support site.

Online Help

QAD 2007 has an extensive online help system. Help is available for most fields found on a screen. Procedure help is available for most programs that update the database. Most inquiries, reports, and browses do not have procedure help.

For information on using the help system in the different QAD 2007 environments, refer to *User Guide Volume 1: Introduction*, *User Guide: QAD Desktop*, and *User Guide: QAD .NET User Interface*.

QAD Web Site

QAD's Web site provides a wide variety of information about the company and its products. You can access the Web site at:

http://www.qad.com

For QAD 2007 users with a QAD Web account, product documentation is available for viewing or downloading at:

http://support.qad.com/

You can register for a QAD Web account by accessing the Web site and clicking the Accounts link at the top of the screen. Your customer ID number is required. Access to certain areas is dependent on the type of agreement you have with QAD.

Most user documentation is available in two formats:

- Portable document format (PDF). PDF files can be downloaded from the QAD Web site to your computer. You can view them with the free Adobe Acrobat Reader. A link for downloading this program is also available on the QAD Web site.
- HTML. You can view user documentation through your Web browser. The documents include search tools for easily locating topics of interest.

Features of ServiceLinQ also include an online searchable solution database to help answer questions about setting up and using QAD products. Additionally, the site has information about training classes and other services that can help you learn about QAD products.

Conventions

QAD 2007 is available in several interfaces: the .NET User Interface, Desktop (Web browser), Windows, and character. To standardize presentation, the documentation uses the following conventions:

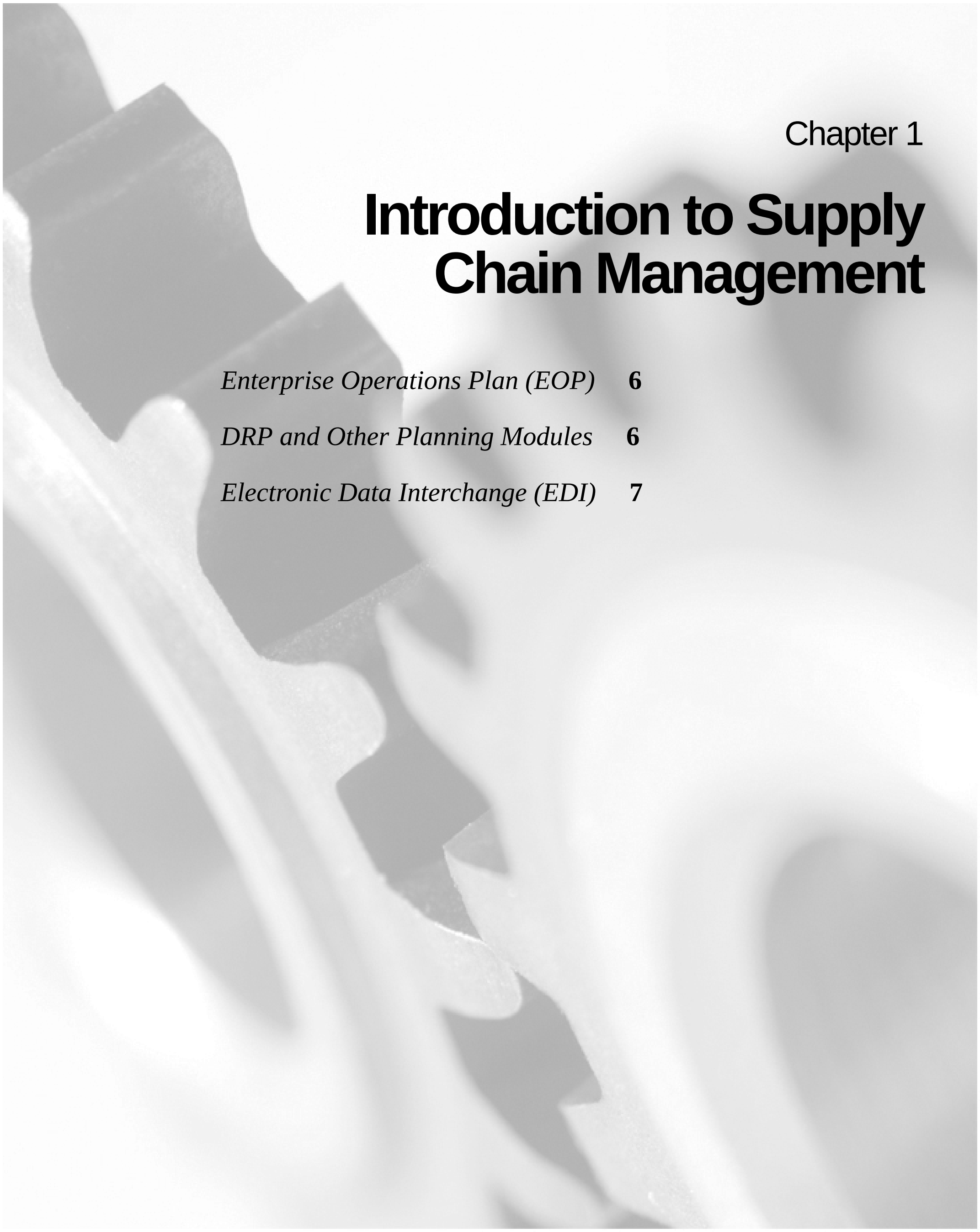
- QAD 2007 screen captures show the Desktop interface.
- References to keyboard commands are generic. For example, choose Go refers to:
  - The Next button in .NET UI
  - The forward arrow in Desktop
  - F2 in the Windows interface
  - F1 in the character interface

  In the character and Windows interfaces, the Progress status line at the bottom of a program window lists the main UI-specific keyboard commands used in that program. In Desktop, alternate commands are listed in the right-click context menu. In the .NET UI, alternate commands are listed in the Actions menu.

  For complete keyboard command summaries for each interface, refer to the appropriate chapters of *User Guide: QAD .NET User Interface*, *User Guide: QAD Desktop* and *User Guide Volume 1: Introduction.*

This document uses the text or typographic conventions listed in the following table.

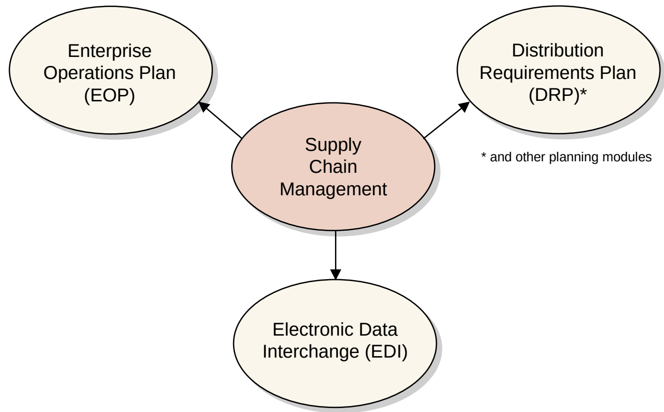
If you see:	It means:
`monospaced text`	A command or file name.
`italicized monospaced text`	A variable name for a value you enter as part of an operating system command; for example, *`YourCDROMDir`*.
`indented command line`	A long command that you enter as one line, although it appears in the text as two lines.
Note	Alerts the reader to exceptions or special conditions.
Important	Alerts the reader to critical information.
Warning	Used in situations where you can overwrite or corrupt data, unless you follow the instructions.



Chapter 1

Introduction to Supply Chain Management

Fig. 1.1
Supply Chain Management



Enterprise Operations Plan (EOP)

See "Enterprise Operations Plan" on page 9.

Use the Enterprise Operations Plan (EOP) to balance supply and demand and reduce inventory levels across the enterprise by consolidating data from multiple sites and databases. EOP helps planners establish global inventory and production levels to satisfy sales forecasts while meeting objectives for profitability, productivity, inventory and lead time reductions, and customer service.

DRP and Other Planning Modules

See "DRP and Other Planning Modules" on page 141.

Use Distributions Requirements Plan (DRP) to manage supply and demand between sites. DRP calculates item requirements at a site and generates DRP orders at the designated supply sites. DRP orders provide intersite demand to MRP at the supply site. DRP shipments manage the transfer of material between sites with appropriate inventory accounting and visibility of orders in transit.

To plan by product line rather than individual item, use Product Line Plan. You can plan shipments, production, inventory, backlogs, and gross margins—all measured by overall sales and cost to ensure that the plan meets all the financial needs of the business.

Use the Resource Plan to check resource loads for both the product line plan and the master schedule. Resource checking is a necessary step for validating the plans and master schedules before submitting them to MRP for detailed planning.

Electronic Data Interchange (EDI)

EDI is an important tool in supply chain management. You can use it to import and export standard business transactions between your company and its customers and suppliers using your e-mail system or network connections.

In QAD 2007, EDI ECommerce is a globally deployable EDI solution that provides EDI with reduced installation and support requirements. EDI ECommerce processes international EDI document standards with most major third-party EDI communications or translation software—referred to collectively as EC subsystems—currently on the market.

EDI is closely related to customer and supplier scheduled orders. Many EDI ECommerce programs can be used to import and export the documents that form the basis of scheduled order processing. For this reason, even though EDI is a supply chain function, it is not discussed in this volume. Rather, it is grouped together in the discussion of Release Management.

See *User Guide Volume 7: Release Management.*

Section 1

Enterprise Operations Plan

This section describes Enterprise Operations Plan:

Chapter 2

About Operations Plan

This chapter introduces general concepts associated with operations planning. Then, it describes how the Enterprise Operations Plan module works and how you use it.

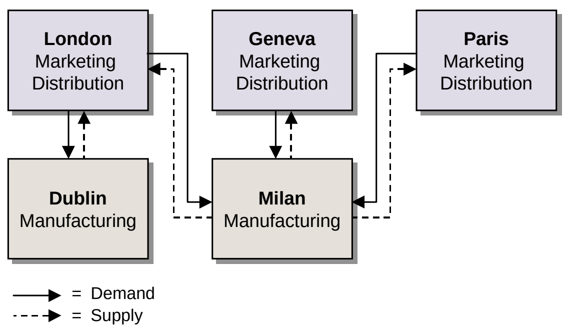
Introduction to Operations Planning

Large manufacturing companies normally have multiple sites. Each site handles at least one of the following activities.

- Sales
- Inventory storage and distribution
- Production

Example A company has five sites, as shown in Figure 2.1. The headquarters is in London. Four additional sites are in Geneva, Paris, Dublin, and Milan.

Fig. 2.1
Example of Organization Structure



Within a site, it is relatively easy to balance sales forecasts, inventory, and capacity. However, it is much harder to do this between sites. For example, Geneva often has inventory shortages, but Paris has surpluses. Also, Milan incurs high overtime costs even though Dublin has ample production capacity.

To control inventory levels and balance resources among sites, many manufacturers use supply chain management techniques such as:

- Setting up focused factories dedicated to specific manufacturing activities
- Consolidating purchasing across sites
- Defining target inventory coverage levels globally instead of by site

These techniques help. But without a central production planning tool, balancing supply and demand between sites in the supply chain is still a difficult task.

Operations planning is a strategic and tactical production planning tool designed to do exactly this. It is especially useful in high-volume, make-to-stock companies.

As a strategic tool, you can use operations planning to:

- Project long-term labor, equipment, and cash needs.
- Develop long-term material procurement plans for negotiations with major suppliers.

As a tactical tool, you can use operations planning to:

- Optimize target inventory and production levels throughout the enterprise.
- Identify variances between planned and actual performance.
- Develop schedules for sites and production lines.

Enterprise resource planning (ERP) is an information system for planning the company-wide resources needed to take, make, ship, and account for customer orders. In companies that use ERP, operations planning is the key link between long-term business planning and medium- to short-term planning and execution activities (Figure 2.2).

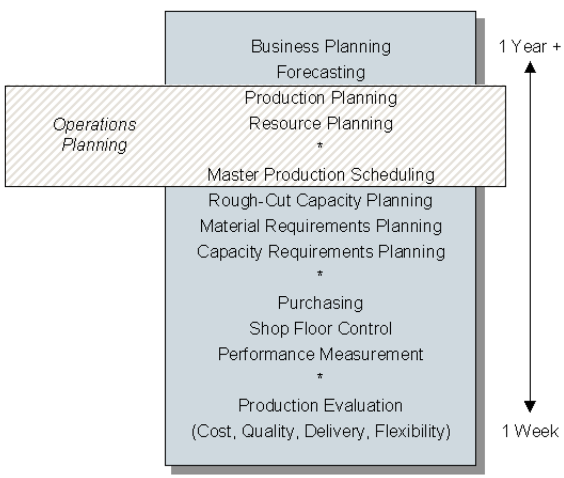


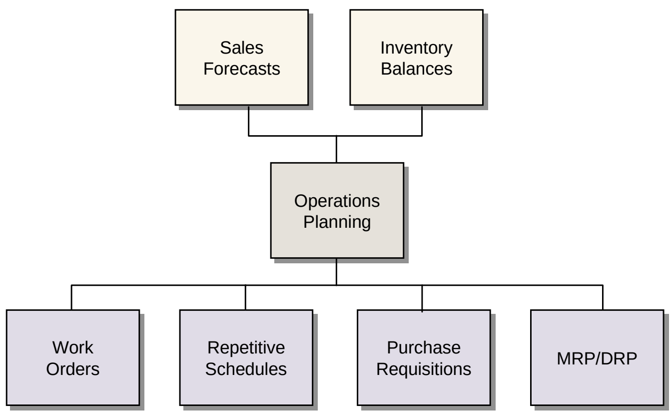
Fig. 2.2
Operations Planning and ERP

Operations planning calculates target inventory levels that support company objectives for profitability, inventory and lead time reductions, customer service, and so on. It also calculates the corresponding production demands. These demands eventually pass into production, purchasing, and material requirements planning (MRP).

The Enterprise Operations Plan module closely parallels the classic APICS model for sales and operations planning. However, it is superior in that it generates firm planned work orders that can replace master schedule orders. To prevent duplications, do not use the Forecast/Master Plan module for item-sites already included in operations planning.

Figure 2.3 summarizes how operations planning transforms data. Operations planning calculates target inventory levels based on upcoming sales forecasts. It also calculates production demands required for target inventory levels. For medium- to short-term planning, it nets these production demands against on-hand inventory balances.

Fig. 2.3
Operations Plan Data Flow



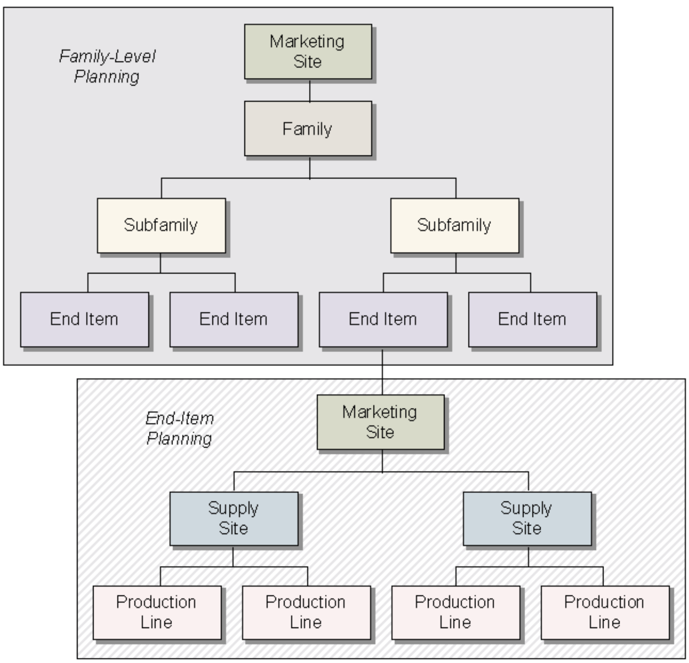
Operations planning transforms production demands into firm planned work orders, repetitive schedules, or purchase requisitions. It also passes these demands into MRP/DRP, which calculates the component requirements.

Operations planning includes two major planning levels:

- Family-level planning. High-volume, make-to-stock companies frequently have a wide variety of similar items that differ only by size, color, packaging, or other minor characteristic. To simplify long-term business planning, these companies forecast and plan production by product family.
- End-item planning. In the medium to short term, companies forecast and plan production for end items.

Figure 2.4 summarizes the relationships between the two levels.

Fig. 2.4
Planning Levels

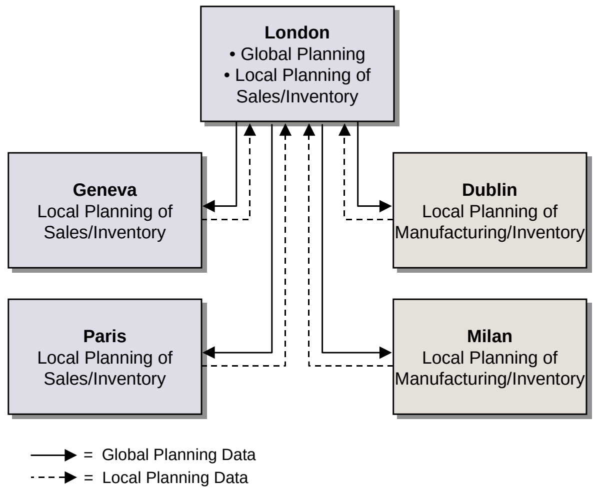


Operations Planning Example

See Figure 2.1 on page 12.

Figure 2.5 shows the operations planning relationships between sites. In addition to marketing, London is the central site for operations planning. Each of the other four sites plans its own activities, then provides the local planning data to the London master scheduler.

Fig. 2.5 Planning Relationships



The London scheduler consolidates this data and calculates a weekly global operations plan for each product. This plan shows consolidated sales forecasts, target inventory levels, and production due.

London then distributes the global plan to all sites. The local site planners transform this plan into weekly production schedules.

In Table 2.1, London calculates a global operations plan. London, Geneva, and Paris generate sales forecasts. Milan and Dublin provide inventory required to satisfy these forecasts. London calculates global sales forecasts by consolidating its own forecasts with those from Geneva and Paris.

Table 2.1 Global Sales Forecasts for London

Week	Geneva Forecasts	Paris Forecasts	Global Forecasts
1	0	0	0
2	4,000	6,000	4,000 + 6,000 = 10,000
3	7,000	5,000	7,000 + 5,000 = 12,000
4	4,500	6,500	4,500 + 6,500 = 11,000

Week	Geneva Forecasts	Paris Forecasts	Global Forecasts
5	4,500	4,500	4,500 + 4,500 = 9,000
6	5,000	5,000	5,000 + 5,000 = 10,000
7	6,000	5,000	6,000 + 5,000 = 11,000
8	6,000	6,000	6,000 + 6,000 = 12,000
9	8,000	5,000	8,000 + 5,000 = 13,000

London calculates global target inventory levels to support the next two weeks of sales forecasts from London, Geneva, and Paris. Therefore, the target inventory level is the total global forecast for the next two weeks.

Table 2.2
Global Forecasts and Target Inventory Levels for London

Week	Global Forecasts	Global Target Inventory Levels
1	0	10,000 + 12,000 = 22,000
2	10,000	12,000 + 11,000 = 23,000
3	12,000	11,000 + 9,000 = 20,000
4	11,000	9,000 + 10,000 = 19,000
5	9,000	10,000 + 11,000 = 21,000
6	10,000	11,000 + 12,000 = 23,000
7	11,000	12,000 + 13,000 = 25,000
8	12,000	13,000 + 0 = 13,000
9	13,000	0

Production due is the consolidated production requirement, calculated with the following formula.

(Sales Forecast + Target Inventory) – Previous Week's Projected Quantity on Hand

For week 1, the projected quantity on hand is the ending inventory balance from the previous week (or 3,000, in this example). For weeks 2 to 9, projected quantity on hand equals the target inventory level for the previous week.

Table 2.3
Production Calculations

Wk	Forecasts	Target Inv	Prev QOH	Global Production Due
1	0	22,000	3,000	(0 + 22,000) – 3,000 = 19,000
2	10,000	23,000	22,000	(10,000 + 23,000) – 22,000 = 11,000
3	12,000	20,000	23,000	(12,000 + 20,000) – 23,000 = 9,000
4	11,000	19,000	20,000	(11,000 + 19,000) – 20,000 = 10,000

Wk	Forecasts	Target Inv	Prev QOH	Global Production Due
5	9,000	21,000	19,000	(9,000 + 21,000) – 19,000 = 11,000
6	10,000	23,000	21,000	(10,000 + 23,000) – 21,000 = 12,000
7	11,000	25,000	23,000	(11,000 + 25,000) – 23,000 = 13,000
8	12,000	13,000	25,000	(12,000 + 13,000) – 25,000 = 0
9	13,000	0	13,000	(13,000 + 0) – 13,000 = 0

London will use the operations plan to view the global picture of sales forecasts, target inventory, and production due for this item. Milan and Dublin will use it for site-level planning, scheduling, and manufacturing activities.

Table 2.4
Production Calculations and Projected Quantities on Hand

Wk	Forecasts	Target Inventory	Production Due	Projected QOH
1	0	22,000	19,000	22,000
2	10,000	23,000	11,000	23,000
3	12,000	20,000	9,000	20,000
4	11,000	19,000	10,000	19,000
5	9,000	21,000	11,000	21,000
6	10,000	23,000	12,000	23,000
7	11,000	25,000	13,000	25,000
8	12,000	13,000	0	13,000
9	13,000	0	0	0

Module Overview

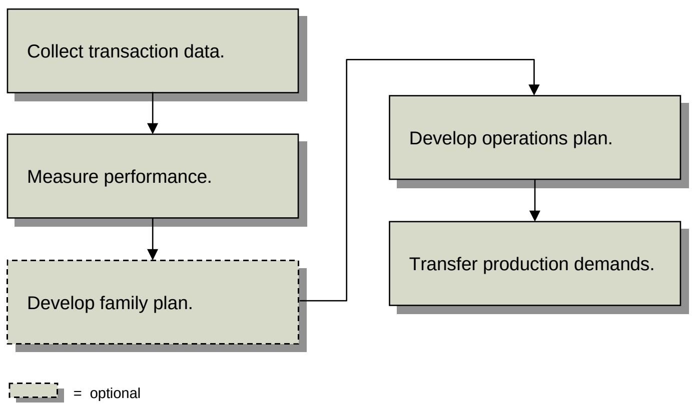
The Enterprise Operations Plan module has many useful features:

- Planning at family and/or end-item levels
- Demand consolidation from multiple sites and databases
- Production demands based on sales forecasts and inventory balances
- Target inventory levels in weeks of coverage, by effective date
- Intersite supply and demand relationships by effective date
- Production demands allocated to sites and lines by percentage
- Interface with resource planning
- Production line scheduling

- Production demand transfer to other modules
- Performance measurement reporting
- Simulation planning

Figure 2.6 summarizes the module work flow.

Fig. 2.6
Operations Plan Work Flow



To generate any plan or performance measurement report, you must first collect item sales, inventory, and production data from company sites and databases. Operations planning activities do not affect the source transactions, only the collected data.

Family-level planning is optional but useful for limiting the number of items to be planned and for grouping items by brand name, target market, production process, and so on. To develop the family plan, you first generate site sales forecasts for each family item. Then, you consolidate these forecasts and calculate the family plan.

You verify the production quantities against known capacity constraints and modify them if necessary. To experiment with planning scenarios, create simulation plans. Then, you explode the plan to calculate the corresponding dependent end-item demand. This step passes the family plan production requirements into the end-item planning cycle.

Operations planning continues at the end-item level, and the processing steps roughly parallel those at the family level. To develop the end-item operations plan, you first load and consolidate sales forecast and inventory data for all company sites. Then, you use this data to calculate the operations plan for each end item.

You verify the production quantities against known capacity constraints and modify them if necessary. Again, you can create simulation plans. If you plan at the family level, you must also roll the changes back into the family plan.

Production demands from the operations plan affect subsequent manufacturing, planning, and purchasing activities. Once you are satisfied with the operations plan, run an explosion process to generate firm planned orders. These orders are similar to master schedule orders generated by the Forecast/Master Plan module. You can approve these orders as firm planned work orders, repetitive schedules, or purchase requisitions.

See *User Guide Volume 3: Manufacturing* for information on MRP.

To ensure that MRP and sales forecast records remain synchronized, also run a balancing utility. Finally, run MRP/DRP to generate planned orders for component requirements.

At the end of the planning cycle, you measure actual vs planned sales, inventory, and production performance. To do this, load end-item data using the same data collection programs used to load plan data. If you plan at the family level, you also roll the actual end-item performance back up to the family level. Then, print and review performance reports.

Chapter 3

Required Implementation

This chapter describes setup activities required to use operations planning.

Introduction

Regardless of how you plan to use the Enterprise Operations Plan module, it is important to set up data correctly not only in the module itself, but in all QAD 2007 modules that interact with the module.

Table 3.1 QAD 2007 Modules and Operations Plan

Module	Data
Multiple Database	Database connections
Manager Functions	Holidays, shop calendar, generalized codes, security
General Ledger	Financial calendar
Distribution Requirements Plan	Control, network codes, source networks
Items/Sites	Sites and site security, product lines, unit of measure conversions, items
Resource Plan	Resource bills, item resource bills
Work Orders	Control
Repetitive	Production lines, shift calendars
Material Requirements Plan	Control
Purchasing	Control

You also must perform some setup tasks within the Enterprise Operations Plan module.

Setting Up Other Modules

Figure 3.1 shows the modules that interact with operations planning calculations. Both the family plan and operations plan incorporate sales forecasts and inventory balances. The operations plan, in turn, can generate MRP and DRP requirements, work orders, repetitive schedules, and purchase requisitions.

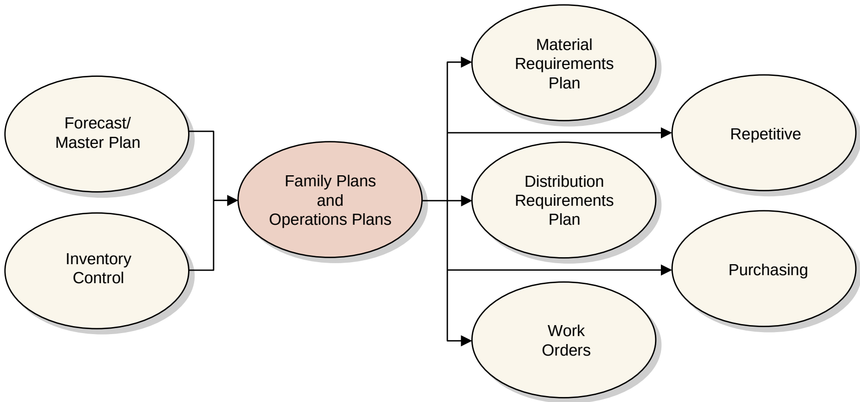


Fig. 3.1
Plan Calculation Inputs/Outputs

Figure 3.2 shows the modules that provide data to operations planning performance reports. Performance reports include quantities from completed work orders and repetitive schedules, purchase order receipts, sales order shipments, and inventory balances.

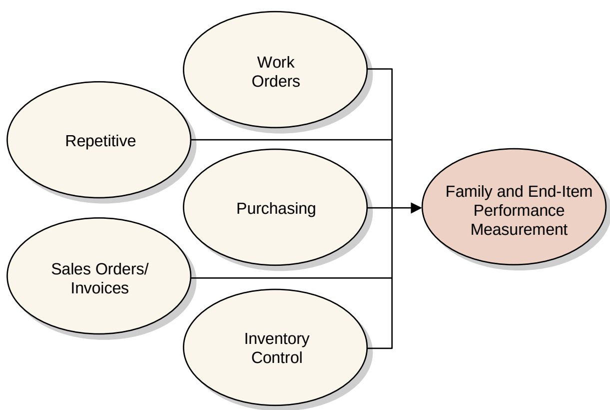


Fig. 3.2
Performance Measurement Inputs

You should implement most or all of the other required modules before implementing Operations Plan.

Implementation is also a good time to review your company's coding schemes and other business practices to take advantage of capabilities offered by QAD 2007.

Multiple Database

See *User Guide Volume 9: Manager Functions*.

If you plan to import operations planning data from multiple databases, you must set up these connections.

In a multi-database environment, all databases that provide data for operations planning require consistent codes for items, sites, and so on. Inconsistencies can create problems transferring planning data between databases. If a database runs manufacturing software other than QAD 2007, make sure that the codes from that database are duplicated in the QAD 2007 database used for operations planning.

Manager Functions

See *User Guide Volume 9: Manager Functions* for information on calendars, generalized codes, and security.

Operations Plan uses the holiday calendar if Move Holiday Production Backward is Yes in Operations Plan Control (33.1.24). In this case, calculations reschedule production backward for non-production weeks.

Generalized codes for item type (pt_part_type) and item group (pt_group) are selection criteria in many operations planning reports and processes.

Set up security for most operations planning programs to prevent unauthorized changes to master data, family plans, and operations plans. This also reduces the possibility that someone will prematurely copy simulation plans over the live plans, approve operations plan orders, or delete records. You can set up security at the menu and field levels.

General Ledger

See *User Guide Volume 4A: Financials*.

Operations planning inquiries and reports use the company financial calendar to display the family plan and operations plan in financial periods as well as calendar weeks. Before you implement Operations Plan, set up financial calendars to support the entire operations planning horizon.

Distribution Requirements Plan

See Chapter 14, "Distribution Requirements Planning," on page 143.

In multisite environments, use the Distribution Requirements Plan module to link sales forecasts and their corresponding production requirements.

Set DRP Control (12.13.24) to support combined MRP/DRP processing. That way, whenever you run MRP, the system also runs DRP, and vice versa. DRP uses the network and source network codes to distribute operations plan item requirements among company sites.

Items/Sites

Most operations planning records and activities are associated with specific company sites. Set up site security in the System Security menu (36.3).

See *User Guide Volume 9: Manager Functions.*

All items used for operations planning are associated with a product line. Product line is a selection criteria in some operations planning reports and processes.

Set up unit of measure conversion factors whenever you plan sales, inventory, and production in different units of measure. For example, you may plan sales and inventory in cases, but production in tons. Similarly, you need conversion factors whenever you use different units of measure for family-level and end-item planning. You may plan in metric tons at the family level but use kilos at the end-item level.

Set up item and item-site records for all items included in operations planning calculations.

- End items are grouped for family-level planning under a family item number.
- The operations plan approval programs use the item-site Purchase/Manufacture code. Set it to blank or M for manufactured items, L for line manufactured items, W for flow items, P for purchased items, or F for family and subfamily items. For DRP items, set it to D in item-site records for marketing sites—sites that generate sales forecasts for the item.
- For DRP items, specify the network code.
- Operations planning uses the time fence. When you calculate or explode the operations plan, you can protect items from last-minute changes inside the time fence.

- For purchased items, operations planning uses inspection, safety, and purchasing lead times for production scheduling.
- For manufactured items, operations planning uses manufacturing and safety lead times for production scheduling.
- Operations planning target inventory calculations ignore safety stock quantities.

Resource Plan

See Chapter 16, "Resource Plan," on page 193.

A primary objective of operations planning is to verify projected production load from the family plan and operations plan against available capacity. Therefore, you must set up resource bill records for critical resources such as equipment and labor. Operations planning uses item resource bills to calculate projected load for individual items.

Work Orders

See *User Guide Volume 3: Manufacturing*.

To process operations plan production requirements as work orders, implement the Work Orders module.

Repetitive

See *User Guide Volume 3: Manufacturing*.

To process operations plan production requirements as repetitive schedules, implement the Repetitive module.

In the Enterprise Operations Plan module, you can allocate production requirements by percentage between multiple lines in a site. The production line record has an additional Primary Line field when you implement Operations Plan. This field identifies whether a line is an item's sole production line. If your company currently uses Repetitive, during the conversion process, you must run Production Line Update (33.25.3) to update existing production line records before you can set up line allocation records in Operations Plan. Operations Plan also uses the line's run crew size to project site labor hours.

Operations Plan uses line shift calendars to calculate the number of available production hours and utilization for each production line. If no shift calendar is available, it uses the shop calendar for the supply site.

Material Requirements Plan

If you use DRP, you can set MRP Control (23.24) to support combined MRP/DRP processing. That way, when you run MRP, the system also runs DRP, and vice versa.

See *User Guide Volume 3: Manufacturing*.

Purchasing

To process operations plan production requirements as purchase requisitions, implement the Purchasing module.

See *User Guide Volume 2A: Distribution*.

Setting Up the Operations Plan Module

Programs used for Operations Plan system setup are located in the System Setup Menu (33.1). The system setup is mandatory for all installations.

- Review the GL calendar.
- Build calendar cross-references.
- Set up Operations Plan Control.

Review the General Ledger Calendar

Before building calendar cross-references, review the general ledger calendar.

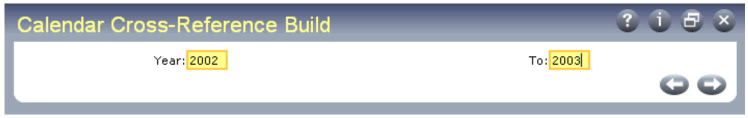
- Use GL Calendar Browse (33.1.1) to show calendar periods starting with a specific fiscal year.
- Use GL Calendar Report (33.1.2) to show calendar periods for a range of entities and fiscal years.

Note The system defines the first week of a new calendar year as the first Thursday in January, in accordance with ISO standards.

Build Calendar Cross-References

In the Enterprise Operations Plan module, you can plan production either in calendar weeks (Monday–Sunday) or in financial periods. Calendar Cross-Reference Build (33.1.4) creates records that link the calendar and the financial calendar.

Fig. 3.3
Calendar Cross-Reference Build (33.1.4)



Year/To. Enter a range of calendar years, starting with the current year.

Table 3.2 shows typical linkages created by the build process.

Table 3.2
Calendar Cross-References

Shop Calendar Weeks		Fiscal Periods
001 January 1 – 7	=	001 January 1 – 31
002 January 8– 14	=	001 January 1 – 31
003 January 15 – 21	=	001 January 1 – 31
004 January 22– 28	=	001 January 1 – 31
005 January 29 – February 4	=	001 January 1 – 31
006 February 5 – 11	=	002 February 1 – 29

If a calendar week spans two financial periods, the build assigns the week to the period associated with the Monday date.

Example You run the build and you have a monthly financial calendar. Week 005 is January 29 – February 4, but the week is linked to period 1 because Monday, January 29 is still in period 1. The build does this because planning activities assign item quantities to the Monday of the week.

Use Calendar Cross-Reference Inquiry (33.1.5) to verify that cross-references between calendar weeks and general ledger periods now exist for all years in the planning horizon, including the current year. Before planning for a new year, verify that cross-references exist for that year. If they do not, build them.

Configure the Control Program

The settings in Operations Plan Control (33.1.24) affect family plan and operations plan calculations. You can reconfigure the Control at any time. Changes to Control settings affect only subsequent planning activities.

Fig. 3.4 Operations Plan Control (33.1.24)

Use Operations Plan. Enter Yes to activate operations planning fields in other modules.

Maximum Weeks Coverage. Enter the maximum number of upcoming weeks (greater than zero but less than 99.99) the system should scan when netting sales forecasts against inventory balances. This setting affects the processing time of these calculations.

Move Holiday Production Backward. Enter Yes to prevent the system from scheduling production for non-production weeks. A non-production week is one that has no scheduled work days. Every day in the non-production week must be set up as a holiday in Holiday Maintenance (36.2.1).

Use Rounding. Enter Yes if family plan and operations plan calculations should round item quantities to whole numbers. Enter No if they should calculate decimal quantities.

Chapter 4

Family Data Implementation

Before you implement data for family-level operations planning, you must implement the standard QAD 2007 and Enterprise Operations Plan module data listed in Chapter 3.

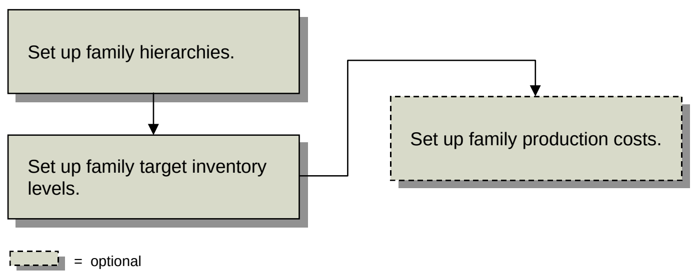
Introduction

Companies typically do family-level operations planning in the long- to medium-term horizon, anywhere from six months to three years. They use it to:

- Project long-term labor, equipment, and financial commitments.
- Develop long-term material procurement plans for negotiations with strategic suppliers.

For family-level planning, QAD 2007 uses three sets of data elements, as shown in Figure 4.1. You can set them up in any order.

Fig. 4.1
Family Data Implementation Work Flow



Programs used for family data implementation are located in the Family Setup Menu (33.3) and in the Item Setup Menu (33.5).

Defining Family Hierarchies

For operations planning, the family hierarchy defines several things:

- Nature of demand relationships for a product family
- End items and subfamilies in the family, and the percentage of total family sales forecast contributed by each
- Marketing sites that generate sales forecasts

Family hierarchies resemble product structures. The hierarchy consists of a parent family item and one or more subfamilies. Subfamilies can be either lower-level hierarchies or end items. Subfamilies in the lowest level must be end items. Within a hierarchy, each subfamily contributes a percentage of the total sales forecast for the family item.

Example The Firenze brand is a top-level family with its marketing site in London. The Firenze family has two subfamilies, Rainbow flavor (30% of demand) and Strawberry flavor (70% of demand). Each subfamily is also a lower-level hierarchy with two end items, an 18-carton case and a 36-carton case.

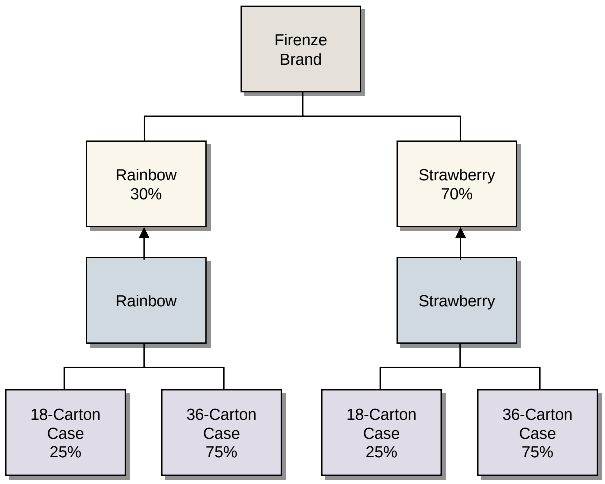
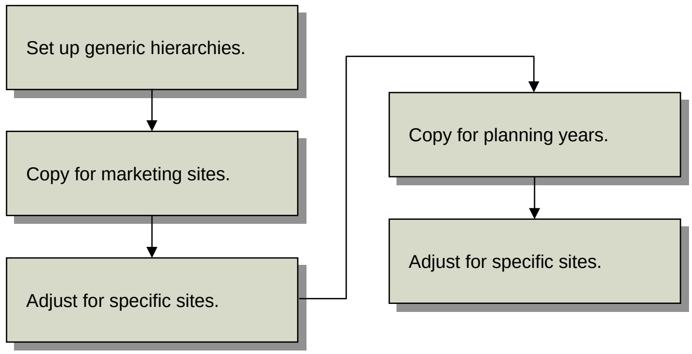


Fig. 4.2
Family Hierarchies

You can set up flexible hierarchies that mirror your company's planning groups. For example, you can set up hierarchies by buyer/planner group, brand, flavor, color, distribution channel, sales region, production line, and so on. The same subfamily or end item can belong to multiple families. Marketing may plan items by geographic region or brand name, but production plans by similarity of manufacturing process.

Subfamily relationships and percentages usually vary by marketing site and planning year. Typically, you set up multiple sets of subfamily relationships for each family hierarchy. Figure 4.3 summarizes the setup work flow.

Fig. 4.3
Hierarchy Setup Work Flow

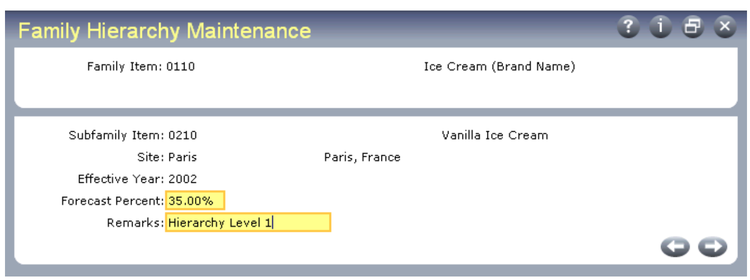


Setting Up Hierarchies

To set up new hierarchies and to change forecast percentages for existing hierarchies, use Family Hierarchy Maintenance (33.3.1). When you set up hierarchies, the system checks for cyclical relationships to prevent you from accidentally assigning a subfamily to itself.

Set up a hierarchy for every family item. Start from the lowest level and work upward to the top family level. The subfamilies for the lowest level must be end items.

Fig. 4.4
Family Hierarchy Maintenance (33.3.1)



Family Item. Enter the family item number. This item must be set up previously in Item Master Maintenance with a Purchase/Manufacture code of F (family).

Subfamily Item. Enter the end-item or family-item number to assign to this level of the hierarchy.

Site. Enter the site code.

Effective Year. Enter the hierarchy year.

Forecast Percent. Enter the percentage of the total family sales forecast typically contributed by this subfamily. Family Plan Explosion (33.7.14) can use this percent to calculate dependent end-item production demands from family demands.

Remarks. Optionally enter a remark about the subfamily level. This remark prints on the Family Hierarchy Report (33.3.3).

Use three programs to review hierarchy data:

- Family Hierarchy Inquiry (33.3.2) displays subfamily levels in a family hierarchy by year, site, level, and item.
- Family Hierarchy Report (33.3.3) is similar, but you can select information for a range of items, sites, and years.
- Family Hierarchy Where-Used Inquiry (33.3.8) displays family items that include the specified subfamily.

Copying Hierarchies

To copy hierarchy records, use Family Hierarchy Copy (33.3.5). For every family item, you must set up subfamily relationships for all marketing sites and years in the planning horizon.

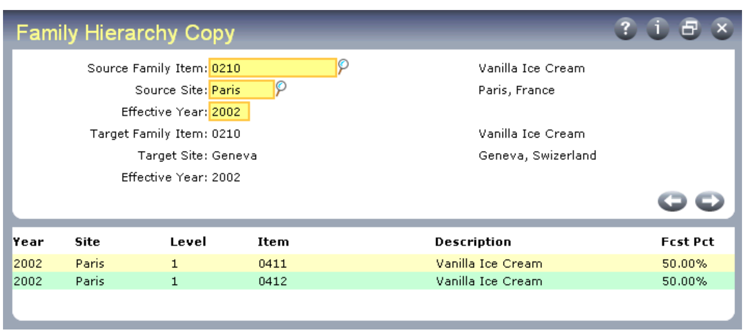


Fig. 4.5 Family Hierarchy Copy (33.3.5)

Source Family Item. Enter the family item number for the source subfamily.

Source Site. Enter the code for the source subfamily's marketing site.

Effective Year. Enter the effective year for the source subfamily relationship.

Target Family Item. Enter the family item number for the target subfamily.

Target Site. Enter the code for the target subfamily's marketing site.

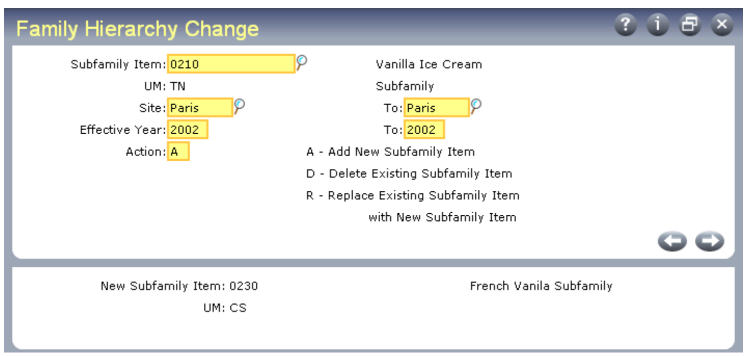
Effective Year. Enter the hierarchy year for the target subfamily relationship.

Changing Subfamily Relationships

After you copy hierarchies, use Family Hierarchy Change (33.3.6) to add, delete, or replace subfamilies for individual marketing sites and years.

Note Regardless of how you change subfamilies, you must later adjust the forecast percentages for all other subfamilies at the affected level, in all hierarchy records you change.

Fig. 4.6
Family Hierarchy Change (33.3.6)



Subfamily Item. Enter the number of an end item or family item for the subfamily level affected by the change.

Site/To. Enter a range of sites to be updated.

Effective Year/To. Enter a range of years to be updated.

Action. Enter the action you want to take with this family relationship:

- Add. The system adds it (along with its lower-level subfamilies, if any) to the same level of the hierarchy as the subfamily item you specify. It also copies the existing subfamily's forecast percent to the new subfamily.

- Delete. The system deletes the subfamily relationship with any higher- or lower-level hierarchies. However, it does not delete lower-level hierarchies previously linked to the subfamily.
- Replace. The system replaces only the subfamily item. It does not change lower-level subfamily relationships.

New Subfamily Item. Enter the number of the family item or end item to replace the specified subfamily item.

UM. The screen displays the inventory unit of measure from the item master record.

Changing Subfamily Forecast Percentages

Whenever you adjust subfamily relationships, you must also adjust forecast percentages for other subfamilies at the affected level. For each level, make sure the percentages add up to 100%.

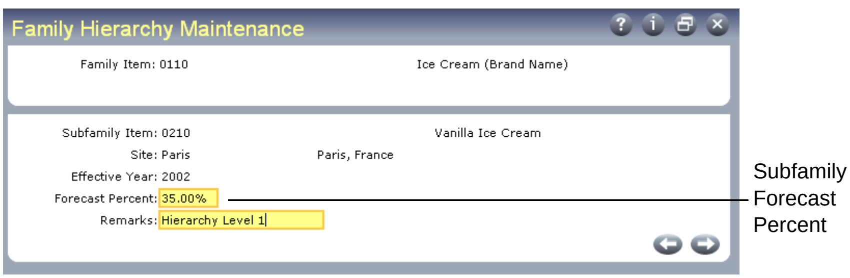


Fig. 4.7 Family Hierarchy Maintenance (33.3.1)

Establishing Target Inventory Levels

Operations planning calculates global target inventory levels to support an item's sales forecasts. In turn, it calculates production requirements based on target inventory levels.

If you do not specify otherwise, the system automatically sets each week's target inventory level to zero. When set this way, you cannot build up inventory for future demands. You also cannot anticipate inventory shortages or surpluses.

To establish target inventory levels, define global weeks-of-coverage factors for minimum, average, and maximum target inventory levels. This method requires more implementation effort. However, it does support inventory buildup for upcoming sales forecasts.

Table 4.1 illustrates how the system uses coverage factors on the family plan. In the example, the system uses an average cover factor of 2.0 to calculate the target inventory level.

Table 4.1
Weeks of Coverage on Operations Plan

No.	Sales Forecast	Target Inventory	Production Due	Projected QOH	Coverage
1	0	500	500	500	2.0
2	300	700	500	700	2.0
3	200	500	0	500	1.0
4	500	0	0	0	0.0

When you change production due quantities on the plan, it uses the minimum (–) and maximum (+) factors to alert you to potential inventory shortages and surpluses relative to the average coverage level. This is illustrated in Table 4.2, which assumes a minimum coverage of 1.0 and a maximum of 3.0.

Table 4.2
Weeks of Coverage on Operations Plan—Production Due Quantities Changed

No.	Sales Forecast	Target Inventory	Production Due	Projected QOH	Coverage	
1	0	500	200	200	0.7	–
2	300	700	500	400	1.4	
3	200	500	0	200	0.4	–
4	500	0	0	–300	0.0	–

Note You can define coverage factors for either top-level family items or for end items. However, to prevent the system from inflating inventory, do not set up coverage factors for both levels or for intermediate subfamily levels.

Setting Up Generic Coverage Factors

Use Weeks of Coverage Maintenance (33.5.1) to set up an item's generic coverage factors. Coverage factors are global, not site-specific, and they must be positive whole numbers.

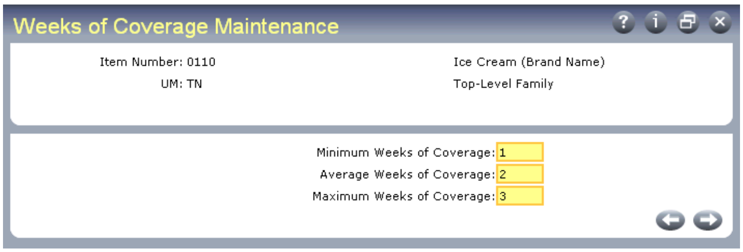


Fig. 4.8 Weeks of Coverage Maintenance (33.5.1)

Item Number. Enter the family item number.

UM. The screen displays the inventory unit of measure from the item master record.

Minimum Weeks of Coverage. Enter the minimum number of weeks of global inventory coverage required for this item. The system uses this factor to calculate and display projected inventory shortages.

Average Weeks of Coverage. Enter the number of weeks of upcoming sales forecasts that corresponds to your company's desired inventory coverage level for this item. Plan calculations use this factor to calculate target inventory levels.

Maximum Weeks of Coverage. Enter the maximum number of weeks of global inventory coverage required for this item. The system uses this factor to calculate and display projected inventory surpluses.

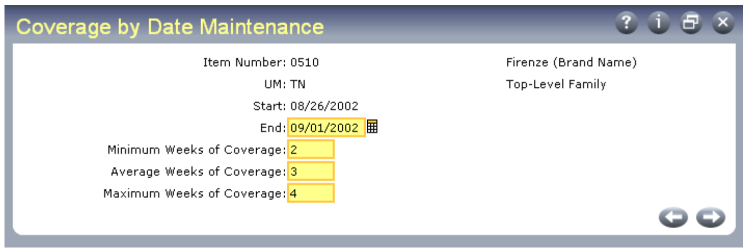
Use two programs to review weeks of coverage factor data:

- Weeks of Coverage Inquiry (33.5.2) displays coverage factors by item, purchase/manufacture code, and buyer/planner.
- Weeks of Coverage Report (33.5.3) is similar to the inquiry, but you can also select information for a range of items.

Setting Up Date-Specific Coverage Factors

To manage items with varying coverage levels, set up date-specific factors in Coverage by Date Maintenance (33.5.5). You must set up generic coverage factors before date-specific factors.

Fig. 4.9
Coverage by Date Maintenance (33.5.5)



See page 39.

This program is similar to Weeks of Coverage Maintenance (33.5.1) but has two additional fields.

Start. Enter the start date for using this record in operations planning. The default is the system date.

End. Enter the end date for using this record in operations planning, or leave it blank.

Use two programs to review date of coverage factor data:

- Coverage by Date Inquiry (33.5.6) displays coverage factors by item, and purchase/manufacture code.
- Coverage by Date Report (33.5.7) enables you to select information for a range of items and start/end dates.

Tracking Family Production Costs

You can record reference information on production costs for product families. However, Operations Plan does not use this information in family plan calculations.

You can maintain multiple sets of hourly production costs for each family item. Each set of costs is uniquely identified by the cost set code and the family item site. If your company uses the Cost Management module, you can set up family costs for a variety of cost sets.

Use Family Item Cost Maintenance (33.3.13) to set up family item production costs.

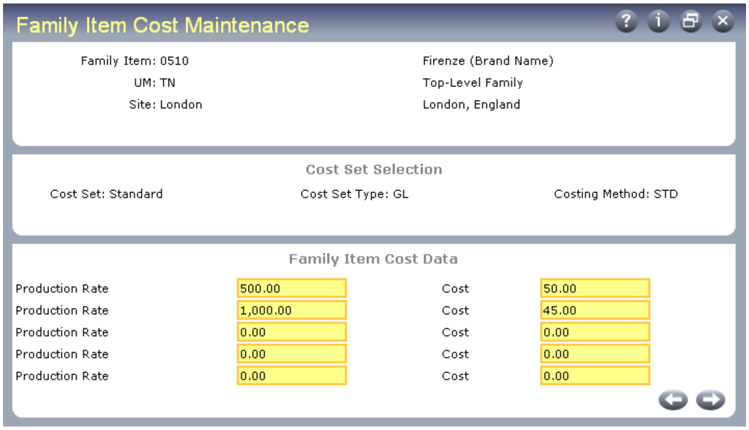


Fig. 4.10
Family Item Cost Maintenance (33.3.13)

Family Item. Enter the family item number.

UM. The screen displays the inventory unit of measure from the item master record.

Site. Enter the site code.

Cost Set. Enter the cost set code.

Cost Set Type. The screen displays the cost set type for the cost set.

Costing Method. The screen displays the costing method for the cost set.

Production Rate. Enter the average hourly production rate for end items in this family. The production rate is the number of units of the family item that can normally be produced per hour on a production line.

Cost. Enter the average hourly production cost for end items in this family. The production cost is the normal hourly production cost for the specified number of units of the family item.

Use two programs to review family item cost data:

- Family Item Cost Inquiry (33.3.14) displays production rates and costs by family item, site, and cost set.
- Family Item Cost Report (33.3.15) enables you to select information for a range of items, sites, and cost sets.

Chapter 5

End-Item Data Implementation

Before you implement data for end-item operations planning, you must implement the standard data and Enterprise Operations Plan module data listed in Chapter 3.

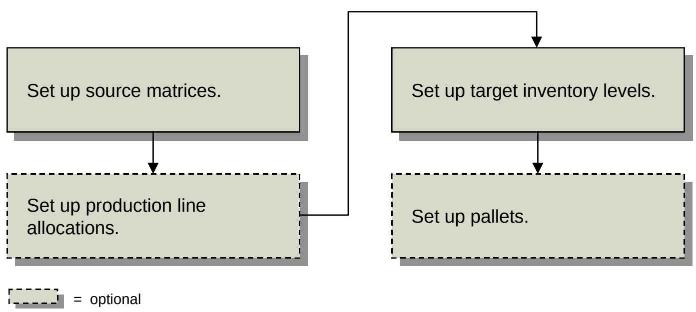
Introduction

Companies typically do end-item operations planning in a short to medium-term time frame, usually less than six months. They use it to:

- Optimize target inventory and production levels throughout the enterprise.
- Develop production schedules for supply sites and production lines.
- Identify variances between planned and actual performance.

For end-item planning, QAD 2007 uses four sets of data elements, as shown in Figure 5.1. You can set them up in any order.

Fig. 5.1
End-Item Data Implementation Work Flow



Using Source Matrices

For operations planning, the item source matrix defines the nature of supply and demand relationships for end items. It identifies the marketing sites that generate sales forecasts. It also defines how the operations plan calculation distributes global production demands to supply sites.

See “Source Networks” on page 150.

Item source matrices resemble single-level DRP source networks. The source matrix consists of one or more marketing sites. Each marketing site, in turn, has one or more supply sites. Each supply site has a percentage that specifies how much of the item's global production demand it contributes.

Figure 5.2 shows a sample source matrix.

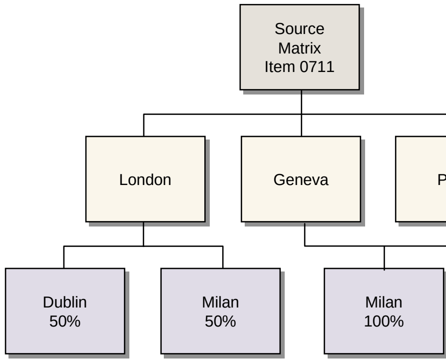


Fig. 5.2 Sample Source Matrix

The source matrix for item 0711 has three marketing sites that generate sales forecasts—London, Geneva, and Paris. London has two supply sites—Dublin, which supplies 50% of London's production demand, and Milan, which supplies 50%. Geneva and Paris each have one supply site, Milan, which supplies 100% of their production demands.

Note For better tracking of requirements between sites, multisite companies should use Operations Plan together with DRP. DRP generates intersite requests that identify the marketing sites that originated the demands.

See "Managing Intersite Requests" on page 162.

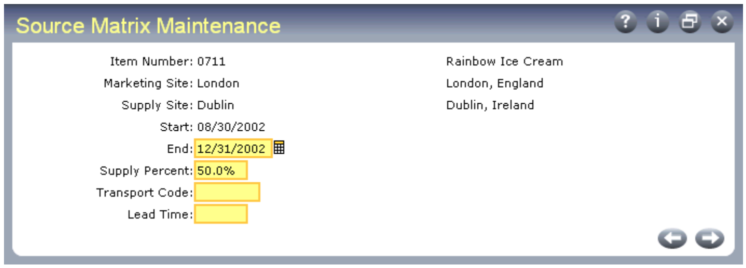
To include an item in the operations plan, you must set up a source matrix for it. The same site can be both a marketing site and a supply site (set supply percent to 100%).

If you use DRP, the operations planning source matrix relationships for marketing and supply sites must mirror the DRP source networks.

Setting Up Source Matrices

To set up source matrices, use Source Matrix Maintenance (33.5.13).

Fig. 5.3
Source Matrix Maintenance (33.5.13)



Item Number. Enter the end-item number.

Marketing Site. Enter the code for the marketing site. A marketing site is any site that generates sales forecasts. Examples include sales offices and distribution centers. An item can have multiple marketing sites in its source matrix.

Supply Site. Enter the code for the supply site. A supply site is any site that provides inventory to a marketing site. For manufactured items, the factory is typically the supply site. For purchased items, the purchasing site is the supply site. In a source matrix, a marketing site can have multiple supply sites.

Start. Enter the start date for using this source matrix in operations planning. To use the source matrix to calculate this week's operations plan, you must set the start date to the previous Monday or earlier.

End. Enter the end date for using this record in operations planning, or leave it blank.

Supply Percent. Enter the percentage of the marketing site's production requirement provided by this supply site. If the marketing site and supply site are the same, enter 100.0%. The system does not verify that the percentages for a marketing site's supply sites total 100.0%.

Transport Code. Enter the transportation code (if any) for inventory the supply site provides to the marketing site. Record this if needed for reference.

Lead Time. Enter the transportation lead time (if any) for inventory the supply site provides to the marketing site. Record this if needed for reference.

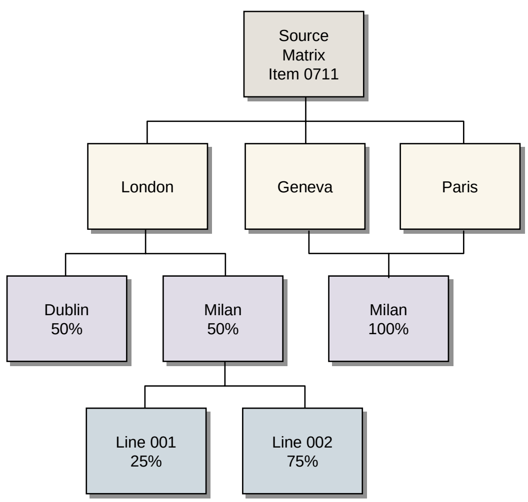
Use two programs to view source matrix data:

- Source Matrix Inquiry (33.5.14) shows marketing and supply site relationships by item.
- Source Matrix Report (33.5.15) is similar, but you can specify ranges of items, sites, and effectivity dates.

Using Line Allocations

Within a supply site, items can be produced on one or more production lines. The line allocation defines how production is distributed between these lines. Figure 5.4 shows how the Milan supply site allocates 25% of its production demand to Line 1 and the remaining 75% to Line 2.

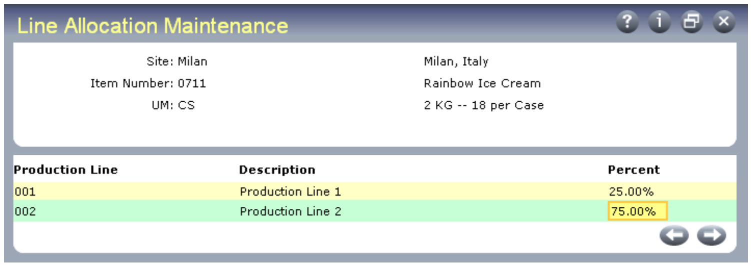
Fig. 5.4
Production Line Allocations



Setting Up Line Allocations

To set up production line allocations, use Line Allocation Maintenance (33.5.17). Set up line allocations only for items produced on multiple production lines within a site. The line percentages must total 100%.

Fig. 5.5
Line Allocation Maintenance (33.5.17)



Site. Enter the site code.

Item Number. Enter the end-item number.

UM. The screen displays the inventory unit of measure from the item master record.

Production Line. Enter the code for the item's production line at this site.

Description. The system displays the production line description from Production Line Maintenance (18.1.1).

Percent. Enter the production line allocation percentage. When you press Go, the system verifies that the total line percentage is 100%.

Use Line Allocation Inquiry (33.5.18) to view line allocations by site and item number.

Setting Target Inventory Levels

Operations planning calculates global target inventory levels to support an item's sales forecasts. In turn, it calculates production requirements based on target inventory levels.

If you do not specify otherwise, the system automatically sets each week's target inventory level to zero. In this case, you cannot build up inventory for future demands. You also cannot anticipate inventory shortages or surpluses.

There are three methods to establish global target inventory levels for end items:

- Calculate target inventory levels based on production demands exploded from the family plan. This is an easy method for items initially planned at the family level. No additional setup is required.
- Calculate target inventory levels based on manually recorded quantities. This method is precise. However, it is hard to maintain this information for many items because it changes constantly. Also, it offers no visibility to project shortages and surpluses.
- Calculate target inventory levels based on upcoming sales forecasts (weeks of coverage). For this method, you define global weeks-of-coverage factors for minimum, average, and maximum target inventory levels. This method requires more implementation effort. However, it does support inventory buildup for upcoming sales forecasts.

Note You can define coverage factors for either top-level family items or end items. However, to prevent the system from inflating inventory, do not set up coverage factors for both levels or for intermediate subfamily levels.

Table 5.1 illustrates how the system uses coverage factors on the operations plan. In the example, the system uses an average coverage factor of 2.0 to calculate the target inventory level.

Table 5.1
Weeks of Coverage on Operations Plan

No.	Sales Forecast	Target Inventory	Production Due	Projected QOH	Coverage
1	0	500	500	500	2.0
2	300	700	500	700	2.0

No.	Sales Forecast	Target Inventory	Production Due	Projected QOH	Coverage
3	200	500	0	500	1.0
4	500	0	0	0	0.0

When you change production due quantities on the plan, it uses the minimum (–) and maximum (+) factors to alert you to potential inventory shortages and surpluses relative to the average coverage level. This is illustrated in Table 5.2, which assumes a minimum coverage of 1.0 and a maximum of 3.0.

Table 5.2
Weeks of Coverage on Operations Plan—Production Due Quantities Changed

No.	Sales Forecast	Target Inventory	Production Due	Projected QOH	Coverage	
1	0	500	200	200	0.7	–
2	300	700	500	400	1.4	
3	200	500	0	200	0.4	–
4	500	0	0	–300	0.0	–

Loading Target Inventory Quantities

See Chapter 6, “Data Collection,” on page 53.

There are two ways to load target inventory quantities manually:

- If you have already recorded target inventory quantities in a non-QAD 2007 database, use Item-Site Data Maintenance (33.13.3) and Item-Site Data Consolidation (33.13.6) to load them into QAD 2007.
- Manually record quantities using Inventory Data Maintenance (33.13.17).

Setting Up Generic and Date-Specific Coverage Factors

See “Setting Up Generic Coverage Factors” on page 39 and “Setting Up Date-Specific Coverage Factors” on page 40.

To set up generic and date-specific coverage factors for end-items, use the same programs described for setting up families. In the Item Number field, enter the end-item number. Coverage factors must be positive numbers. They can be either whole numbers or decimals.

Tracking Pallet Data

A pallet is a portable platform used to store and transport inventory. Some companies group items by pallet for operations planning. The Enterprise Operations Plan module does not use pallet information for calculations. However, you can record pallet information if your company needs it for reference or for use in an executive information system.

Setting Up Generic Pallet Information

Use Pallet Maintenance (33.5.20) to record generic pallet information. You can record dimensions and capacity for an unlimited number of pallet types.

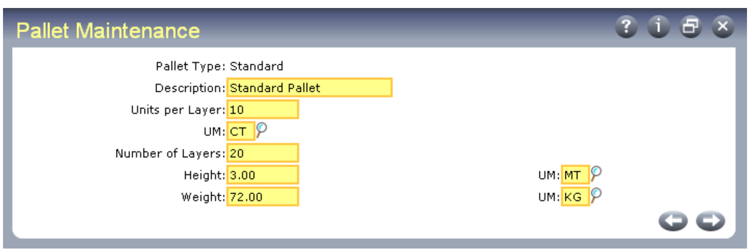


Fig. 5.6 Pallet Maintenance (33.5.20)

Pallet Type. Enter a code (up to eight characters) for the pallet type.

Description. Enter the description of the pallet type.

Units per Layer. Enter the maximum number of inventory units that can be stored on this pallet type.

UM. The system displays the inventory unit of measure from the item master record.

Number of Layers. Enter the maximum number of layers this pallet type supports.

Height/UM. Enter the height and height unit of measure for the pallet type.

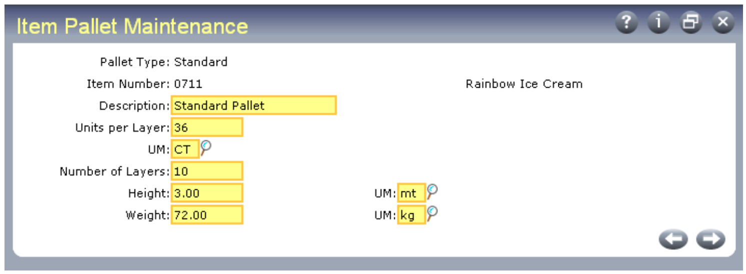
Weight/UM. Enter the weight and weight unit of measure for the pallet type.

Pallet Inquiry (33.5.21) displays information for one or all pallet types.

Setting Up Item Pallet Information

Use Item Pallet Maintenance (33.5.23) to customize pallet information for specific items.

Fig. 5.7
Item Pallet Maintenance (33.5.23)



Pallet Type. Enter a code (up to eight characters) for the pallet type.

Item Number. Enter the end-item number.

Description. Enter the description of the pallet type.

Units per Layer. Enter the maximum number of inventory units that can be stored on this pallet type.

UM. The screen displays the inventory unit of measure from the item master record.

Number of Layers. Enter the maximum number of layers this pallet type supports.

Height/UM. Enter the height and height unit of measure for the pallet type.

Weight/UM. Enter the weight and weight unit of measure for the pallet type.

Use Item Pallet Inquiry (33.5.24) to view information for one or all item pallet types.

Chapter 6

Data Collection

This chapter describes data collection activities used for both family and end-item planning.

Introduction

Operations planning consolidates and transforms transaction information from all company sites into a central database. Family plans and operations plans use sales forecast and on-hand inventory quantities. Performance measurement reporting also uses actual production and purchase order receipt quantities.

Before you can calculate plans or print reports, you must load this information into the Enterprise Operations Plan module of the central planning site. The load generates records that summarize the original item numbers, quantities, and transaction effective dates at the time of the load.

Table 6.1
Operations Data to Be Loaded

To Generate	Collect
Family plans	Sales forecasts (only for family plans based on end-item sales forecasts)
	Beginning inventory balances
Operations plans	Sales forecasts
	Beginning inventory balances (only for multilevel operations plans)
	MRP gross requirements
Performance reports	Actual sales shipments
	End-item inventory balances
	Completed work orders
	Completed repetitive schedules
	Purchase order receipts

In many respects, Operations Plan is a separate environment from other modules. Changes you record in Operations Plan do not update original sales forecasts, inventory balances, or other data. Also, changes you record in other modules do not update previously loaded quantities (unless you reload). This approach gives you a secure central planning environment.

Figure 6.1 summarizes the data collection work flow.

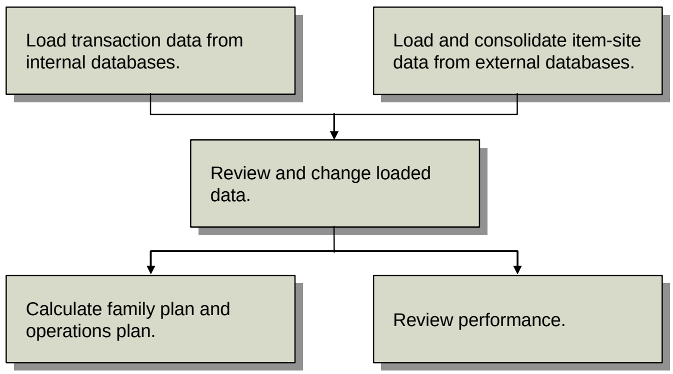


Fig. 6.1
Data Collection Work Flow

Loading Data from Application Databases

Loading data from application databases is a one-step process that transfers the data directly from the source modules into the Enterprise Operations Plan module.

To load data from application databases, use Transaction Data Load (33.13.1). This program collects end-item sales, inventory, and production data for sites in all connected application databases. Table 6.2 summarizes load options.

Table 6.2
Transaction Data Load Options

To Generate	Set
Operations plans based on family plans	Update Inventory QOH: Yes
Family plans and operations plans based on end-item sales forecasts	Update Sales Forecasts: Yes Update Inventory QOH: Yes
Performance measurement reports	Update Actual Sales: Yes Update Actual Production: Yes Update Inventory QOH: Yes

To include purchase order receipts in loaded inventory balances and actual production, set Include PO Receipts to Yes. To include non-nettable inventory in loaded inventory balances, set Include Non-Nettable Inventory to Yes.

You can rerun the load as many times as necessary. Each load overwrites the effects of previous loads.

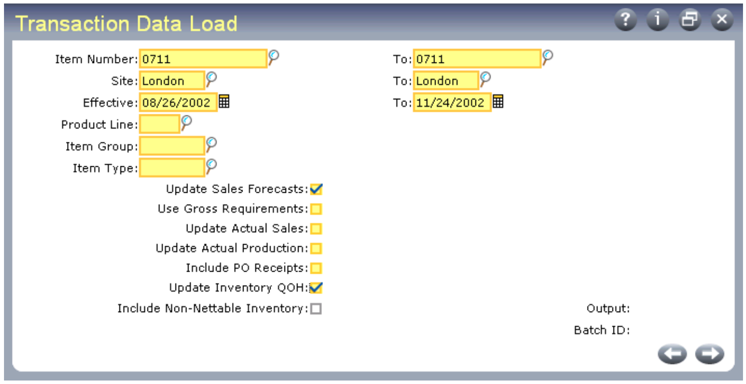


Fig. 6.2
Transaction Data Load (33.13.1)

Item Number/To. Enter the end-item range. The load does not collect data for family items.

Site/To. Enter the site range.

Effective/To. Enter the effective date range for the load. When you specify a non-Monday start date or a non-Sunday end date, the system changes it. To load inventory quantities for a planning week, you must set the effective date to the Monday of the previous week. The ending inventory of the prior week becomes the beginning projected available inventory for the current planning week.

Product Line. Enter the end-item product line.

Item Group. Enter the item group. This code is useful for choosing items for processing. For example, you can use it to segregate items included in operations planning from those that are not.

Item Type. Enter the item type. This code is useful for choosing items for processing. For example, you can use it to segregate items included in operations planning from those that are not.

Update Sales Forecasts. Enter Yes to load end-item sales forecasts for the family plan or operations plan. Enter No if you develop the operations plan using sales forecasts generated by Family Plan Explosion (33.7.14).

Use Gross Requirements. Enter Yes to load gross requirements for multilevel operations planning. Source Matrix Explosion (33.13.8) will then use gross requirements from the most recent materials plan to calculate target inventory levels for component items.

Update Actual Sales. Enter Yes to load sales shipments for performance measurement reporting.

Update Actual Production. Enter Yes to load completed work orders and completed repetitive schedules for performance measurement reporting.

Include PO Receipts. Enter Yes to include purchase order receipts and shipper confirmations in loaded inventory balances and actual production quantities.

Update Inventory QOH. Enter Yes to load beginning on-hand inventory balances as of 00:01 of the Monday starting effective date.

Include Non-Nettable Inventory. Enter No to exclude non-nettable inventory from loaded inventory balances. You can access this field only when Update Inventory QOH is Yes. Non-nettable quantities are normally excluded because they are defective, in transit, or reserved. Enter Yes to include them.

Planning for Multilevel Operations

Transaction Data Load (33.13.1) has another useful application in companies that calculate operations plans for components as well as end items. You can use the Use Gross Requirements option to collect MRP gross requirements for the components, so that the operations plan includes the components as well as the end items.

Example Premium Ice Cream Company makes ice cream bars sold in packages of 6 and 12. The ice cream bars are an end item when sold individually, but a component when sold in packages. An operations plan is generated at both the bar and package levels. In Transaction Data Load (33.13.1), Gross Requirements is Yes. The system adds forecast data to the gross requirements data to determine the operations plan requirements. Figure 6.3 illustrates this multilevel planning situation.

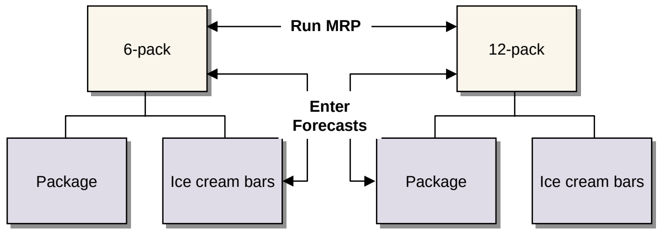


Fig. 6.3
Multilevel Operations Planning

For multilevel operations planning:

1. Enter sales forecasts to record all independent demands for the end item and the component.
2. Run MRP to calculate the gross requirements—the dependent demands for the end-item forecasts.
3. Use Transaction Data Load (33.13.1) to load the planning data. To load the sales forecasts, set Update Sales Forecasts to Yes. To load the MRP gross requirements, set Use Gross Requirements to Yes.

Loading Data from external Databases

Loading data from external databases is a distributed process. You can review and correct data as you load it into QAD 2007, and then again after you load it into the Enterprise Operations Plan module.

Loading Item-Site Data

See *User Guide Volume 9: Manager Functions* for information on CIM.

You can record data in Item-Site Data Maintenance (33.13.3) manually. However, to load many records, it is more efficient to generate an ASCII file from the source database, then use the CIM programs in the Manager Functions module to load the file into Item-Site Data Maintenance (33.13.3).

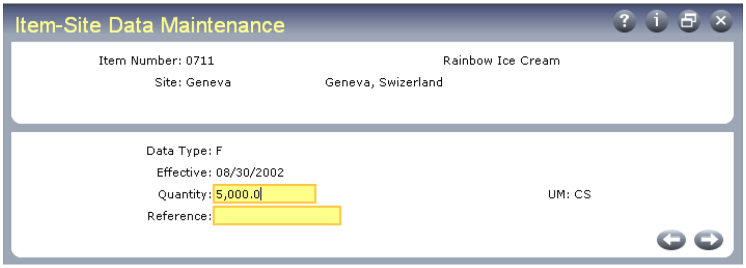


Fig. 6.4 Item-Site Data Maintenance (33.13.3)

Item Number. Enter the end-item number.

Site. Enter the site code.

Data Type. Enter F (sales forecasts), S (actual sales), W (actual production), P (production due), or I (on-hand inventory balances).

Effective. Enter the effective date for including the loaded data in operations planning calculations. When loading inventory quantities, you must set the effective date to the previous Monday.

Quantity. Enter the item quantity to load.

Reference. Optionally, enter a comment about the item quantity. This comment prints on the Item-Site Data Report (33.13.5).

Use two programs to view loaded item-site records.

- Item-Site Data Inquiry (33.13.4) shows records by item number, site, and data type.
- Item-Site Data Report (33.13.5) is similar, but you can select ranges of items, sites, and effective dates.

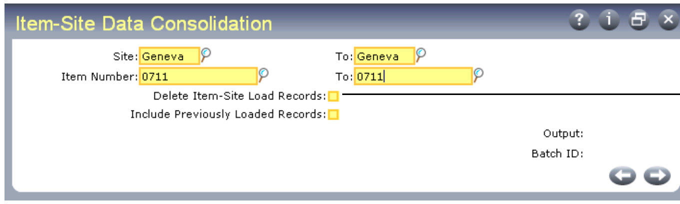
Consolidating Loaded Data

After you load data, you must consolidate the loaded item quantities into weekly buckets. Operations planning requires these to generate family plans, operations plans, and performance reports.

After you successfully consolidate, reduce the database size by rerunning the consolidation program to delete the original load records.

Use Item-Site Data Consolidation (33.13.6) to consolidate the loaded data.

Fig. 6.5
Item-Site Data Consolidation (33.13.6)



Run a second time with this field set to Yes to save space in the database.

Site/To. Enter the site range.

Item Number/To. Enter the item number range.

Delete Item-Site Load Records. Enter Yes to delete previously consolidated item-site operations planning records. Do not do this until you have completed operations planning processing for the planning period.

Include Previously Loaded Records. Enter Yes to include previously consolidated records in this process.

Maintaining Loaded Data

After you load planning data, review it before calculating plans or printing reports. Correct errors or update operations planning records for significant transaction changes that occurred after you loaded data.

Note Changes made in the Operations Plan do *not* update transaction records in other modules or in other databases.

Changing Sales Data

See *User Guide Volume 9: Manager Functions* for information on CIM.

To change previously loaded forecast or shipment quantities, use Sales Data Maintenance (33.13.13). You can also use this program (manually or with CIM) to record sales quantities.

By default, the screen displays item information in calendar weeks, but you can switch to general ledger periods.

Warning If you normally plan in weeks, do not change quantities in period view. If you do, the system permanently reassigns all weekly quantities to the first week of each period.

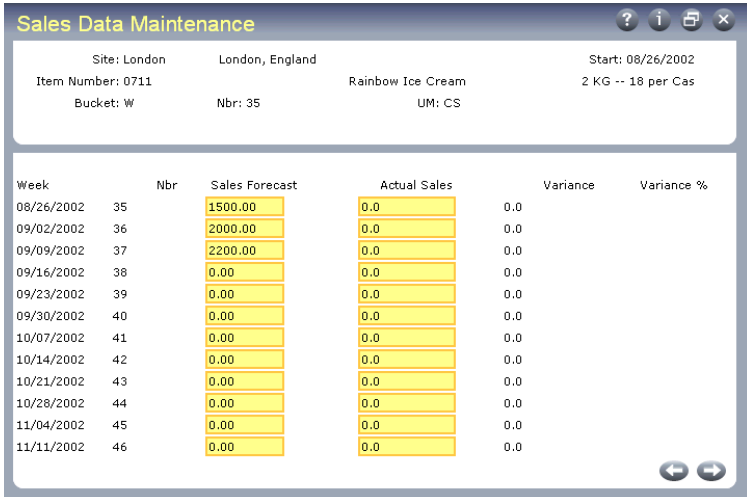


Fig. 6.6
Sales Data Maintenance (33.13.13)

Site. Enter the site code.

Start. Enter the start date for the first calendar week or financial period. The default start date is the system date. If the date you enter is not the Monday of the week or the first day of the period, the system changes it.

Item Number. Enter the item number.

Bucket. Enter W to group item quantities into calendar weeks that start on Mondays. Enter P to group quantities into financial periods with a start date that is the first day of the period.

Nbr. Enter the number of the first calendar week or financial period to display. If you enter a bucket number instead of a start date, the system fills in the start date for you. The system also changes the start date to the first day of this week or period if this day is not already the start date.

UM. Enter the unit of measure for viewing and changing item quantities. The default unit of measure is from the item master record.

Sales Fcst. Enter the sales forecast quantity to update. Sales orders that consume forecasts do not automatically reduce these sales forecast totals.

Actual Sales. Enter the sales shipment quantity to update. You can update this only in week view. In period view, the system cannot associate shipments back to the correct week.

Variance. When you change item quantities, the screen recalculates quantity variances between planned and actual performance.

Variance %. When you change item quantities, the screen recalculates percentage variances between planned and actual performance.

Reviewing Sales Data

Use two programs to view sales data:

- Sales Data Inquiry (33.13.14) shows sales forecast and actual sales shipment quantities by item-site.
- Sales Data Report (33.13.15) is similar, but you can select ranges of items, sites, and planning periods, and the unit of measure to display quantities.

Changing Inventory Data

See *User Guide Volume 9: Manager Functions* for information on CIM.

To change previously loaded target inventory levels or on-hand inventory balances, use Inventory Data Maintenance (33.13.17). You can also use this program (manually or with CIM) to record inventory quantities.

By default, the screen displays item information in calendar weeks, but you can switch to GL periods.

Warning If you normally plan in weeks, do not change quantities in period view. If you do, the system permanently reassigns all weekly quantities to the first week of each period.

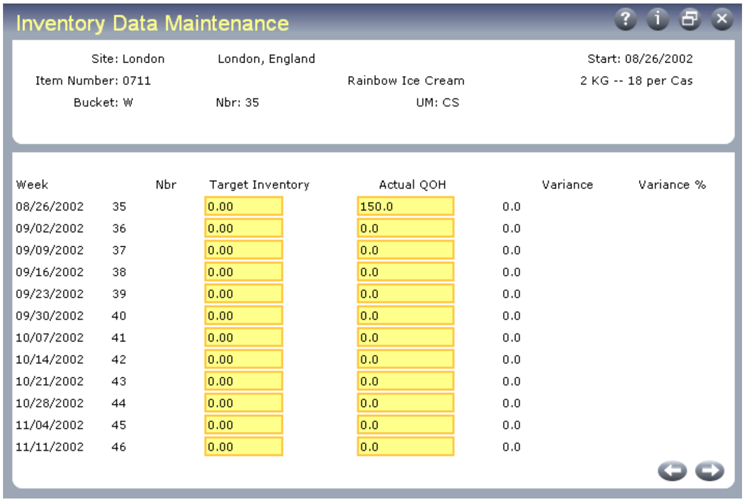


Fig. 6.7
Inventory Data Maintenance (33.13.17)

This program is very similar to Sales Data Maintenance (33.13.13). Only two fields are different:

See “Changing Sales Data” on page 60.

Target Inventory. Enter the target inventory quantity to update.

Actual QOH. Enter the actual inventory balance to update. You can update this only in week view. In period view, the system cannot associate balances back to the correct week.

Important If you record or change target inventory levels for the operations plan, you must set Calculate Target Inventory Level to No when you run Source Matrix Explosion (33.13.8). Otherwise, the explosion will overwrite your changes.

Reviewing Inventory Data

Use two programs to view inventory data:

- Inventory Data Inquiry (33.13.18) shows target inventory levels and actual on-hand inventory quantities by item-site.
- Inventory Data Report (33.13.19) is similar, but you can select ranges of items, sites, and planning periods, and the unit of measure to display quantities.

Changing Production Data

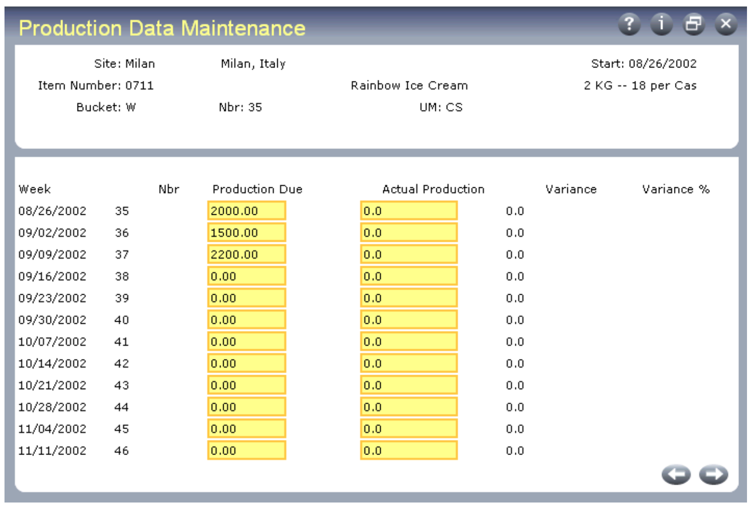
See *User Guide Volume 9: Manager Functions* for information on CIM.

To change previously loaded production due or actual production quantities, use Production Data Maintenance (33.13.21). You can also use this program (manually or with CIM) to record production quantities.

By default, the screen displays item information in calendar weeks, but you can switch to GL periods.

Warning If you normally plan in weeks, do not change quantities in period view. If you do, the system permanently reassigns all weekly quantities to the first week of each period.

Fig. 6.8
Production Data Maintenance (33.13.21)



See "Changing Sales Data" on page 60.

This function is very similar to Sales Data Maintenance (33.13.13). Only two fields are different:

Production Due. Enter the production due quantity to update.

Actual Production. Enter the actual production quantity to update. You can update this only in week view. In period view, the system cannot associate quantities back to the correct week.

Important If you record or change production due quantities for the operations plan, you must set Calculate Production Due to No when you run Source Matrix Explosion (33.13.8). Otherwise, the explosion will overwrite your changes.

Reviewing Production Data

Use two programs to view production data:

- Production Data Inquiry (33.13.22) shows production due and actual production quantities by item-site.
- Production Data Report (33.13.23) is similar, but you can select ranges of items, sites, and planning periods, and the unit of measure to display quantities.

Chapter 7

Family-Level Planning

This chapter describes the operations planning cycle for product families.

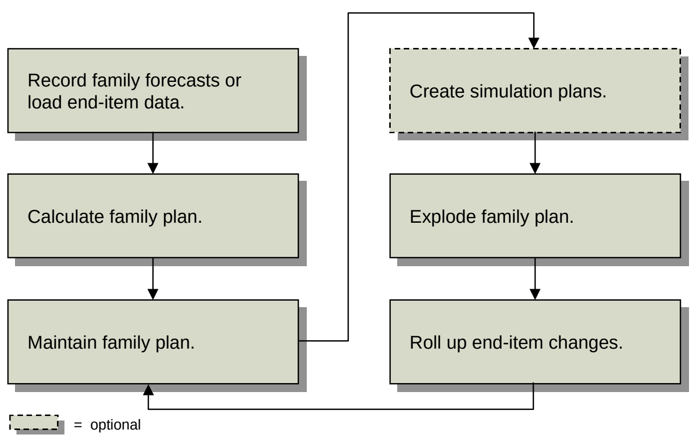
Introduction

Companies typically do family-level operations planning in a long- to medium-term time frame, usually six months to three years. They use it to:

- Project long-term labor, equipment, and financial commitments.
- Develop long-term material procurement plans for negotiations with strategic suppliers.

QAD 2007 maintains an operations plan for every family item. This plan shows sales forecasts, target inventory levels, and production demands for the planning horizon. You can view the plan from the global and site levels.

Fig. 7.1
Family Processing Work Flow



For long-term planning, use Forecast Maintenance (22.1) to record sales forecasts by family and marketing site. See *User Guide Volume 3: Manufacturing* for details about using the Forecast/Master Plan module.

See Chapter 6, “Data Collection,” on page 53.

For medium-term planning, use the programs on the Item-Site Consolidation menu (33.13) to load existing end-item sales forecasts and inventory balances into the Enterprise Operations Plan module.

Calculating Family Plans

Run Global Consolidation (33.7.1) to calculate the family plan. The consolidation totals marketing site sales forecasts to the global level and calculates the required target inventory and production due quantities. This plan can be based on either family or end-item sales forecasts.

- By default, the family plan is based on family-item forecasts recorded in Forecast Maintenance (22.1). The consolidation collects these from all sites in connected QAD 2007 databases. If you have forecasts in non-QAD 2007 databases, load them into Forecast Maintenance in the operations planning database using the CIM load process. You typically use this method for longer-term planning.
- To roll up and consolidate end-item forecasts, first load them, plus beginning inventory balances, into the Enterprise Operations Plan module using either Transaction Data Load (33.13.1) or Item-Site Data Maintenance (33.13.3). You typically use this method for shorter-range planning.

See Chapter 6, “Data Collection,” on page 53.

You can recalculate the family plan as many times as necessary. Each calculation overwrites the effects of the previous one.

Before you load or consolidate data for the family plan, you can review planning data for family items or end items.

- To review sales forecasts, use Forecast Inquiry (22.3) or Forecast Report (22.4).
- To review inventory balances, use Stock Availability Inquiry (3.17).

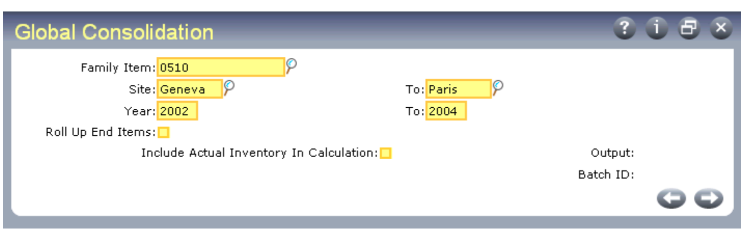


Fig. 7.2 Global Consolidation (33.7.1)

Family Item. Enter the family item number.

Site/To. Enter the site range.

Year/To. Enter a maximum range of three calendar years, starting with the current year.

Roll Up End Items. Enter Yes to calculate global family sales forecast from end-item forecasts and to roll up end-item inventory quantities to the family level. The rollup starts from the end-item level at the bottom of the hierarchy and works upward to the top-level family item, performing a unit-of-measure conversion at each subfamily level. The rollup also calculates the actual percentage of sales forecast that each end item or subfamily in the family-site hierarchy contributes to the family forecast. Enter No to consolidate site-level family forecasts.

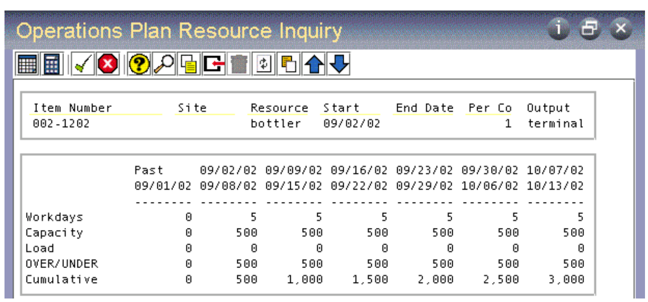
Include Actual Inventory in Calculation. If Roll Up End Items is Yes, indicate whether the system should include on-hand inventory quantities for those items in the forecast calculations.

Maintaining Family Plans

After you consolidate, review the family plan and verify the production due quantities against available resource capacity. Adjust production due as necessary.

Operations Plan Resource Inquiry (33.15.21) displays projected resource load for the family plan production due quantity.

Fig. 7.3 Operations Plan Resource Inquiry (33.15.21)


Operations Plan Resource Inquiry

Item Number	Site	Resource	Start	End Date	Per Co	Output
002-1202		bottler	09/02/02		1	terminal

	Past 09/01/02	09/02/02 09/08/02	09/09/02 09/15/02	09/16/02 09/22/02	09/23/02 09/29/02	09/30/02 10/06/02	10/07/02 10/13/02
Workdays	0	5	5	5	5	5	5
Capacity	0	500	500	500	500	500	500
Load	0	0	0	0	0	0	0
OVER/UNDER	0	500	500	500	500	500	500
Cumulative	0	500	1,000	1,500	2,000	2,500	3,000

Item Number. Enter the item number. To review resource load for all items that use this resource, leave blank.

Site. Enter the site code.

Resource. Enter the code of the critical resource to review.

Start. Enter the start date for reviewing information. The default start date is Monday of the current week.

End. Enter the end date for including information. The default end date is blank.

Per. Enter the multiple to use for resource load calculations. By default, the system calculates resource load based on actual available workdays and resource capacity (Per = 1). But you can reset this multiple to see how load would balance against additional capacity. The formula is:

*(Production Due * Resource Quantity Per) ÷ Per * (Workdays * Resource Capacity)*

Output. Enter the output for the report—terminal, printer, or ASCII file name.

Press Go to view the lower half of the screen.

Workdays. The number of days in the shop calendar week, as defined in Calendar Maintenance (36.2.5).

Capacity. The weekly capacity for the resource, calculated as:

*Workdays in the Weekly Shop Calendar * Daily Resource Capacity*

The shop calendar is defined in Calendar Maintenance (36.2.5). Resource capacity is defined in Resource Maintenance (21.1).

Load. The weekly production load for the specified resource, calculated as:

*Production Due Quantity * Resource Quantity Per*

You can adjust production due in Operations Plan Maintenance (33.15.1). Resource quantity per is defined in Item Resource Bill Maintenance (21.17).

Over/Under. Each week's capacity shortages and availability, calculated as:

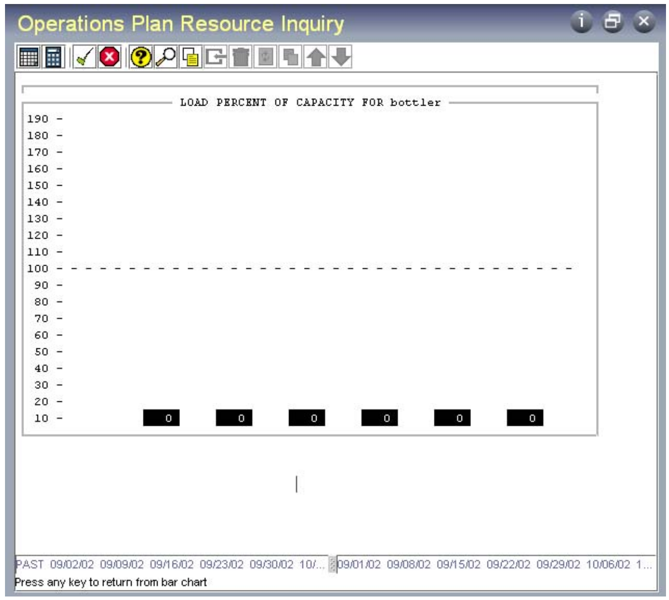
Capacity – Load

Cumulative. The total capacity shortage or availability for the resource. This number varies, based on the start date you specify.

Tip
Negative figures denote shortages and positive figures denote available capacity.

Press Go again to display a graphical view of the load data.

Fig. 7.4
Operations Plan Resource Inquiry, Graph View



Load Percentage of Capacity. The graph shows the percentage of capacity already consumed by projected load, calculated as:

Production Load ÷ Weekly Resource Capacity

Changing Family Plans

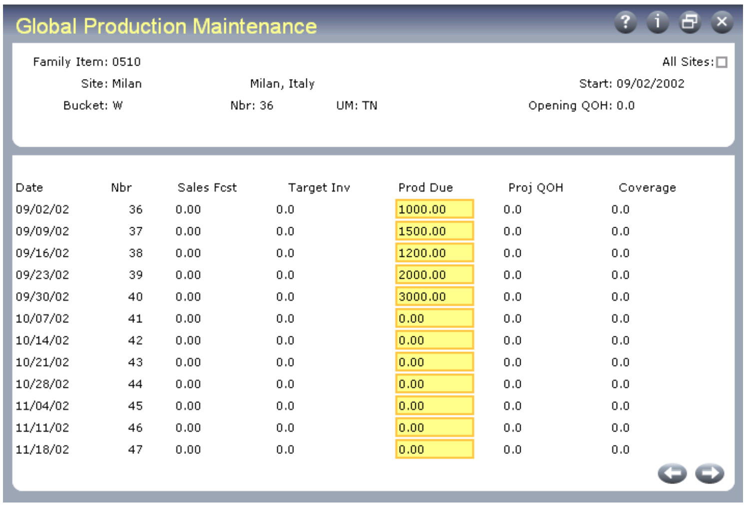
Use Global Production Maintenance (33.7.3) to view the plan and change production due quantities. You can also delete a family plan, either for an entire year, or for only specific periods within the year—for example, if an item becomes obsolete.

You can manipulate the plan at either the global or site levels. Except for sales forecasts, calculations of global and site quantities are the same.

Display item information either by calendar week or by GL period. If you normally plan in weeks, do not change production quantities in period view. If you do, the system permanently reassigns all weekly quantities to the first week of the period.

To delete a plan for an entire year, select the plan and press Delete. To delete a plan for part of the year, reset the production due quantities to zero for the affected period.

This program updates only the planning database. Other databases do not have to be connected.


Global Production Maintenance

Family Item: 0510 All Sites:

Site: Milan Milan, Italy Start: 09/02/2002

Bucket: W Nbr: 36 UM: TN Opening QOH: 0.0

Date	Nbr	Sales Fcst	Target Inv	Prod Due	Proj QOH	Coverage
09/02/02	36	0.00	0.0	1000.00	0.0	0.0
09/09/02	37	0.00	0.0	1500.00	0.0	0.0
09/16/02	38	0.00	0.0	1200.00	0.0	0.0
09/23/02	39	0.00	0.0	2000.00	0.0	0.0
09/30/02	40	0.00	0.0	3000.00	0.0	0.0
10/07/02	41	0.00	0.0	0.00	0.0	0.0
10/14/02	42	0.00	0.0	0.00	0.0	0.0
10/21/02	43	0.00	0.0	0.00	0.0	0.0
10/28/02	44	0.00	0.0	0.00	0.0	0.0
11/04/02	45	0.00	0.0	0.00	0.0	0.0
11/11/02	46	0.00	0.0	0.00	0.0	0.0
11/18/02	47	0.00	0.0	0.00	0.0	0.0

Fig. 7.5
Global Production Maintenance (33.7.3)

Family Item. Enter the number of a top-level family item. You cannot change subfamily quantities in this screen.

All Sites. Enter Yes to display the global production due quantity for this family item. Enter No to display the quantity for one site.

Site. Enter the marketing site code. You can access this field only if All Sites is Yes.

Start. Enter the start date for the first calendar week or financial period. The default start date is the system date. If the date you enter is not the Monday of the week or the first day of the period, the system changes it.

Bucket. Enter W to group item quantities into calendar weeks that start on Mondays. Enter P to group quantities into financial periods with a start date that is the first day of the period.

Nbr. Enter the number of the first calendar week or financial period to display. If you enter a bucket number instead of a start date, the system fills in the start date for you. The system also changes the start date to the first day of this week or period if this day is not already the start date.

UM. Enter the unit of measure for viewing and changing item quantities. The default unit of measure is the one from the item master record.

Opening QOH. The screen displays the total opening on-hand inventory balance for all end items in the family. However, the system does not use this to calculate production due quantities.

Sales Fcst. Global sales forecast is the family forecast for all marketing sites in the family hierarchy. Site sales forecast is the family forecast for one marketing site. If you consolidated the plan using the Roll Up End Items option, family forecasts were calculated from forecasts for the end items in the family.

Target Inv. Target inventory level is the desired level of coverage specified by the family's average weeks-of-coverage factor. This quantity will be either this week's forecast, if the coverage factor is zero, or the total forecast for the number of upcoming weeks specified by the average coverage factor.

Prod Due. The screen displays the family item's projected production demand. The formula is:

(Sales Forecast + Target Inventory) – Previous Week's Projected QOH

For family items, previous projected QOH is zero for the first week, and production due is gross (not netted against on-hand inventory). When you change global production due (All Sites is Yes), the system recalculates global projected quantity on hand and weeks of coverage. It also distributes the effects of the change proportionately to all marketing sites.

Proj QOH. Initially, projected quantity on hand equals the target inventory level. When you change production due, the system recalculates it as:

(Previous Week's Projected QOH + Production Due) – Sales Forecast

For the first week, the projected QOH is the opening QOH.

Coverage. Initially, projected weeks of coverage is the item's average weeks-of-coverage factor. When you change production due, the system recalculates this, using the item's minimum and maximum coverage factors to project inventory shortages (–) and surpluses (+) relative to the average weeks of coverage. An asterisk (*) indicates that projected coverage satisfies the maximum coverage requirement specified in Operations Plan Control (33.1.24).

Use two programs to review family plans:

- Global Production Inquiry (33.7.4) shows the global or site plan for the specified family item. To review the global plan, leave site blank. You can select the starting week or period and unit of measure to view quantities.
- Global Production Report (33.7.5) is similar, but you can select ranges of family items, sites, and effective years.

Reviewing Projected Profit

As you balance the plan, use Profit Projection Report (33.7.16) to assess the potential profitability of family sales, inventory, and production. The program calculates potential gross margin associated with a family item's sales forecasts, target inventory levels, or planned production. It calculates gross margin as price minus cost.

You can view this report in different currencies and in weeks or periods. Select summary or detail mode. Summary mode shows total item-site quantity, cost, and price for the selected weeks/periods. Detail mode shows this information for each week or period.

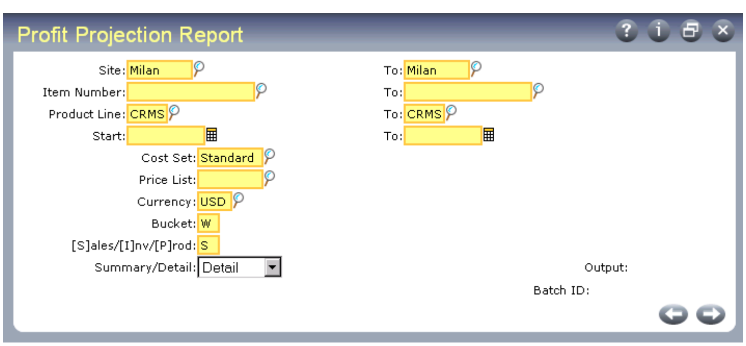


Fig. 7.6
Profit Projection Report (33.7.16)

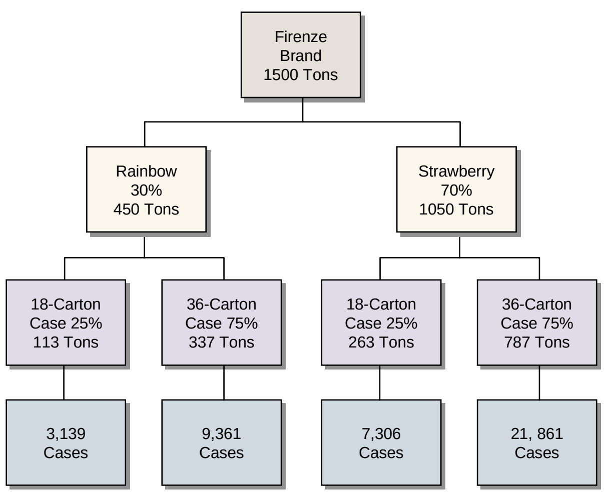
Exploding Family Plans

After you are satisfied with the family plan, explode the dependent end-item demands out to the marketing sites. This automatically transfers control of the family production demands to the end-item level for subsequent planning and execution.

Figure 7.7 summarizes the explosion calculation, using a UM conversion of 1 metric ton = 27.778 cases. Starting from the top-level family, the explosion calculates the dependent demands for each subfamily and marketing site, converting units of measure between levels as necessary. The system stores the resulting end-item demands as sales forecast demands in the Enterprise Operations Plan module.

If you generated the family plan from family-level forecasts, use the Balance Forecasts for DRP option to preserve the link between the end-item demands and their respective marketing sites.

Fig. 7.7
Explosion Calculation



Reviewing Family Forecast Percentages

Before you explode the family plan, use Rollup Percentage Report (33.7.7) to compare planned and calculated forecast percentages. The report displays the family hierarchy's forecast percent along with the actual forecast percentages for the upcoming six weeks. The report sorts by hierarchy and subfamily level.

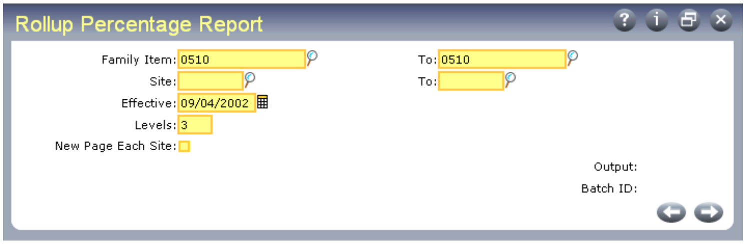


Fig. 7.8
Rollup Percentage Report (33.7.7)

Exploding Family Plans

Run Family Plan Explosion (33.7.14) only when you are ready to transfer control of the family production quantities down to the end-item level.

Important Do not record forecast quantities in Sales Data Maintenance (33.13.13) for the end items in the family before running Family Plan Explosion. If you do, the explosion will overwrite them. However, you can adjust forecast quantities after running the explosion.

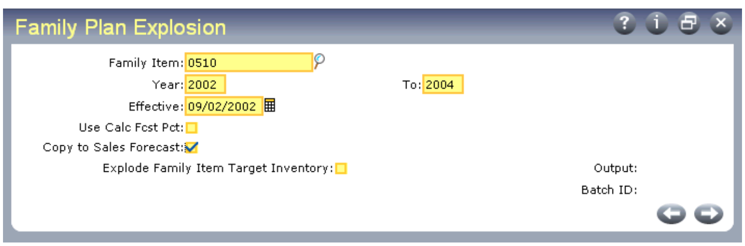


Fig. 7.9
Family Plan Explosion (33.7.14)

Family Item. Enter the family item number.

Year/To. Enter a maximum range of three calendar years, starting with the current year. For example, when the start year is 2002, the end year must be 2004 or less.

Effective. Enter the start date for including family plan quantities in the explosion. The default date is the Monday of the current week. For planning periods after this date, the explosion generates dependent demands from the family gross production quantities. It also overwrites existing end-item forecast quantities for these periods. The explosion ignores forecast quantities for planning periods prior to the date.

See “Roll Up End Items” on page 70.

Use Calc Fcst Pct. Enter Yes to explode the plan based on actual forecast percentages updated by Global Consolidation (33.7.1). Do this if you used the Roll Up End Items option during the consolidation. Otherwise, enter No to use the subfamily percentages from Family Hierarchy Maintenance (33.3.1). To compare the two percentages, review the Rollup Percentage Report (33.7.7).

Copy to Sales Forecast. If you generated the family plan from family forecasts, you must set this option to Yes. The explosion then generates sales forecast records for the end-item production demands. If you do not set this option, you will not be able to trace production demands back to their respective marketing sites because MRP and DRP will not generate intersite requests for family production demands.

Explode Family Item Target Inventory. If Yes, target inventory calculated at the family level is exploded down the family hierarchy tree to the end-item level. If No, only family level inventory is calculated.

If you set this field to Yes here, make sure you set Calculate Target Inventory Level to No in Source Matrix Explosion (33.13.8). Otherwise, the end-item target inventory calculated by this program will be overwritten.

Rolling Up End-Item Changes

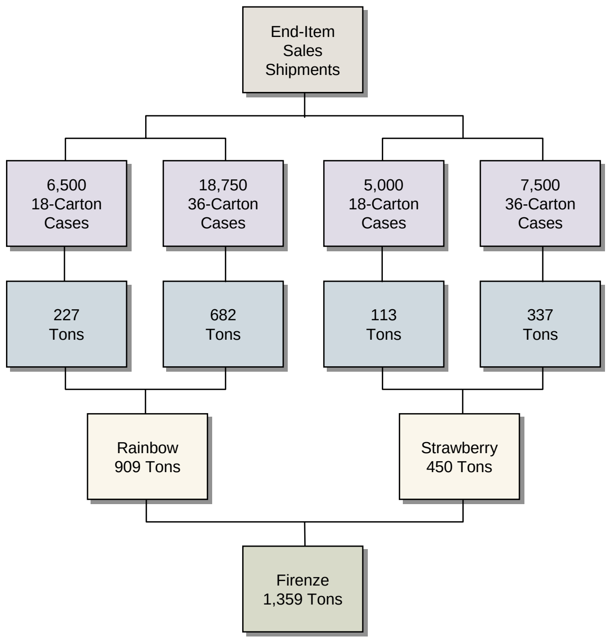
Throughout the planning process, it is important to update the family plan whenever you make changes at the end-item level. For example, you must do this whenever you change the operations plan, or you may produce too much or too little in a future week. When you update the family plan, the system converts the end-item quantity back into the equivalent family item quantity.

The system does not automatically update the family plan. You must roll up changes:

- After you finish updating operations plans for each week or period.
- Before you print performance measurement reports.

Figure 7.10 summarizes the rollup calculation, using a UM conversion of 1 case = 0.036 metric tons. The rollup updates the family projected weeks of coverage and projected quantity on hand in the family plan. For performance reporting, it also calculates the planned/actual variances and updates the actual percentage of sales in the family hierarchy.

Fig. 7.10
Rollup Calculation



To ensure that the operations plan and family plan remain balanced, sites must define and enforce rigid procedures for executing the rollup.

Running Family Plan Rollup

Use Family Plan Rollup (33.7.13) to roll up changes. The rollup converts end-item quantities to family item quantities based on the percentages specified in the family hierarchy. It also converts quantities to the family unit of measure, at all subfamily levels of the hierarchy.

Be sure to select all sites and years affected by the end-item changes. The rollup includes changes for all end items in the family hierarchy.

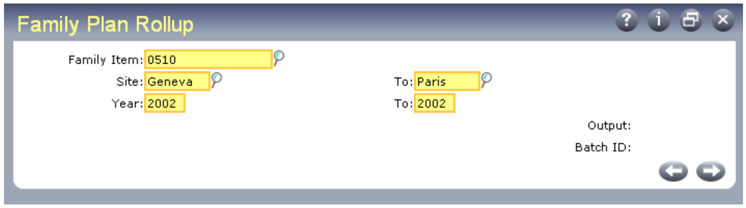


Fig. 7.11
Family Plan Rollup
(33.7.13)

Family Item. Enter the family item number.

Site/To. Enter the site range.

Year/To. Enter a maximum range of three calendar years, starting with the current year.

Chapter 8

End-Item Planning

This chapter describes the operations planning cycle for end items.

Introduction

Companies typically do end-item operations planning in a short- to medium-term time frame, usually zero to six months. They use it to:

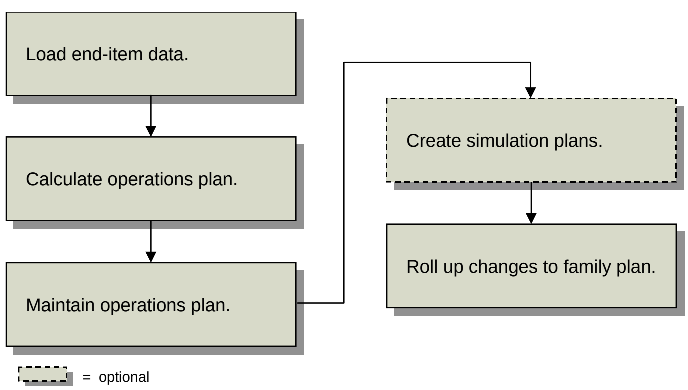
- Optimize target inventory and production levels throughout the enterprise.
- Develop production schedules for supply sites and production lines.
- Identify variances between planned and actual performance.

QAD 2007 maintains an operations plan for every end item. This plan shows global sales forecasts and target inventory levels and site-level production demands for the planning horizon. The end-item operations plan is the equivalent of a master production schedule.

Important If you use the Enterprise Operations Plan module for master scheduling, do *not* use the Forecast/Master Plan module for the same item-site.

Figure 8.1 shows how calculating and maintaining the operations plan fit into the overall family plan process.

Fig. 8.1
End-Item Processing Work Flow

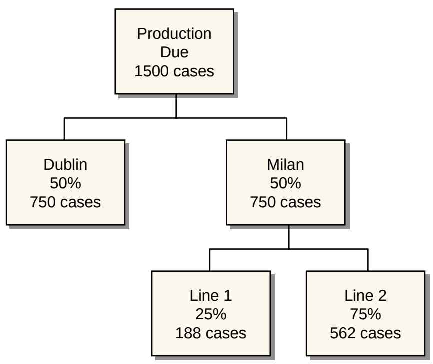


Calculating Operations Plans

To calculate an item's operations plan, you run Source Matrix Explosion (33.13.18). This program calculates global sales forecasts, target inventory levels, and production due. It distributes production due to supply sites and production lines based on the percentages you have defined in the item source matrix and site line allocations.

Example A company defines a source matrix for an item specifying production of 50% in Dublin and 50% in Milan. Total production due of the item is 1500 cases. The Milan site defines site line allocations of 25% to Line 1 and 75% to Line 2. Figure 8.2 summarizes the explosion calculation.

Fig. 8.2
Explosion Calculation



Several factors influence how the explosion calculates production quantities and due dates:

- The explosion assumes infinite capacity.
- By default, the explosion calculates an item's target inventory levels and production due based on upcoming sales forecasts and beginning on-hand inventory balances. However, you can set the explosion to simply consolidate manually recorded target inventory levels or even production due dates loaded from individual sites.
- You can set the explosion to adjust production due quantities based on item-site MRP order modifiers. You can also prevent the explosion from changing production due inside the item-site time fence.

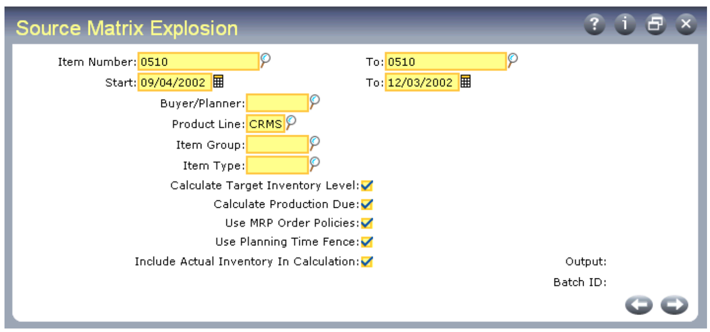
- When scheduling production, the explosion automatically considers item-site lead times—safety, inspection, purchasing, and manufacturing.
- The explosion does not schedule production for non-production weeks if Move Holiday Production Backward is Yes in Operations Plan Control (33.1.24), but reschedules production backward to the Monday of the first available working week. The Control setting does not affect production scheduling for working weeks with holidays.

Running Source Matrix Explosion

Tip
The explosion takes a long time and is best run in batch.

Run Source Matrix Explosion (33.13.8) to calculate the operations plan. If necessary, you can rerun the explosion. Subsequent explosions completely overwrite the effects of previous ones.

Fig. 8.3
Source Matrix Explosion (33.13.8)



Item Number/To. Enter the item number range.

Start/To. Enter the effective date range. The maximum range is three years, including the entire start year. For example, when the start year is 2002, the end year must be 2004 or less. When you specify a non-Monday start date or a non-Sunday end date, the system changes it.

Buyer/Planner. If you specify a value, the system processes only items assigned to this person.

Product Line. If you specify a value, the system processes only items belonging to this product line.

Item Group. If you specify a value, the system processes only items belonging to this item group.

Item Type. If you specify a value, the system processes only items belonging to this item type.

Calculate Target Inventory Level. Enter Yes to calculate target inventory levels based on item average weeks-of-coverage factors. Enter No to prevent the explosion from overwriting target inventory quantities recorded or adjusted in Inventory Data Maintenance (33.13.17).

Calculate Production Due. Enter Yes to calculate each item’s production due quantity. Enter No to prevent the explosion from overwriting quantities recorded or adjusted in Production Data Maintenance (33.13.21).

Use MRP Order Policies. Enter Yes to adjust calculated production due quantities based on the supply site’s item order policies and order modifiers. Enter No to calculate production due independent of these factors.

Use Planning Time Fence. Enter Yes to prevent the explosion from recalculating production quantities due within the item-site time fence period. This setting protects the master schedule against last-minute orders with a cumulative lead time that exceeds the available production time. Enter No to permit recalculations.

Include Actual Inventory in Calculation. When the global family sales forecast is calculated by Global Consolidation (33.7.1) by rolling up end items, you can choose to include or exclude the opening inventory balance in the calculation. This field has the same effect when the plan is exploded out. The field is typically set the same way in both programs.

Maintaining Operations Plans

After you run the explosion, review the operations plan and verify the production due quantities against available resource capacity. Adjust production due as necessary.

Reviewing Projected Resource Load

See page 70 for details.

Use Operations Plan Resource Inquiry (33.15.21) to display projected resource load for the family plan production due quantity.

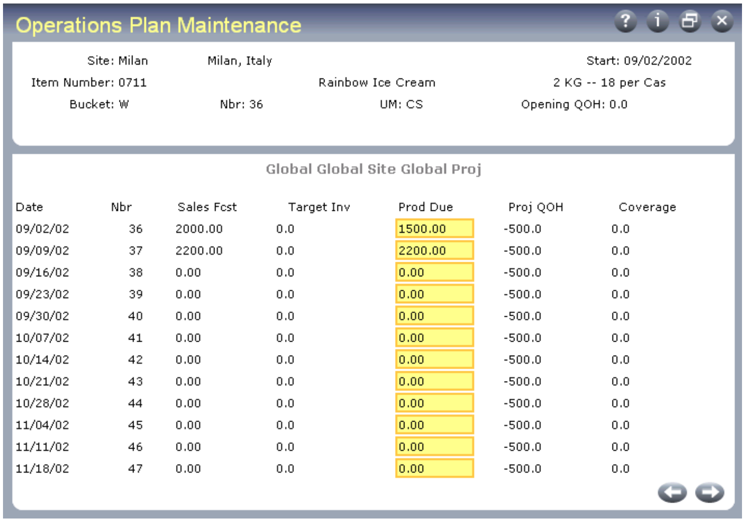
Changing Site Operations Plans

If you are a central master scheduler, use Operations Plan Maintenance (33.15.1) to view global sales forecasts and target inventory levels and to adjust production due quantities for individual supply sites. As you change quantities, the system recalculates projected quantity on hand and projected weeks of coverage.

You can also delete an operations plan, either for an entire year, or for only specific periods within the year—for example, if an item becomes obsolete.

You can display item information either by calendar week or by general ledger period. If you normally plan in weeks, do not change production quantities in period view. If you do, the system permanently reassigns all weekly quantities to the first week of the period.

To delete a plan for an entire year, choose the plan and press Delete. To delete a plan for part of the year, reset the production due quantities to zero for the affected period.



Date	Nbr	Sales Fcst	Target Inv	Prod Due	Proj QOH	Coverage
09/02/02	36	2000.00	0.0	1500.00	-500.0	0.0
09/09/02	37	2200.00	0.0	2200.00	-500.0	0.0
09/16/02	38	0.00	0.0	0.00	-500.0	0.0
09/23/02	39	0.00	0.0	0.00	-500.0	0.0
09/30/02	40	0.00	0.0	0.00	-500.0	0.0
10/07/02	41	0.00	0.0	0.00	-500.0	0.0
10/14/02	42	0.00	0.0	0.00	-500.0	0.0
10/21/02	43	0.00	0.0	0.00	-500.0	0.0
10/28/02	44	0.00	0.0	0.00	-500.0	0.0
11/04/02	45	0.00	0.0	0.00	-500.0	0.0
11/11/02	46	0.00	0.0	0.00	-500.0	0.0
11/18/02	47	0.00	0.0	0.00	-500.0	0.0

Fig. 8.4 Operations Plan Maintenance (33.15.1)

Site. Enter the supply site code.

Start. Enter the start date for the first calendar week or financial period. The default start date is the system date. If the date you enter is not the Monday of the week or the first day of the period, the system changes it.

Item Number. Enter the end-item number.

Bucket. Enter W to group item quantities into calendar weeks that start on Mondays. Enter P to group quantities into financial periods with a start date that is the first day of the period.

Nbr. Enter the number of the first calendar week or financial period to display. If you enter a bucket number instead of a start date, the system fills in the start date for you. The system also changes the start date to the first day of this week or period if this day is not already the start date.

UM. Enter the unit of measure for viewing and changing item quantities. The default unit of measure is the one from the item master record.

Opening QOH. The screen displays the item’s opening on-hand inventory balance.

Sales Fcst. The screen displays the item's consolidated demand from all marketing sites. These global sales forecasts can originate from either end-item sales forecasts or dependent end-item demand calculated by Family Plan Explosion (33.7.14).

Target Inv. The screen displays the item's consolidated target inventory level for all sites, based on the average weeks-of-coverage factor or on quantities recorded for individual sites.

Prod Due. The screen displays the item's projected production demand for the supply site. The formula is:

(Sales Forecast + Target Inventory) – Previous Week's Projected QOH

For the first week, the previous projected QOH equals the opening QOH. When you change this quantity, the system recalculates global projected quantity on hand and weeks of coverage.

Tip
For the first week, the projected QOH is the opening QOH.

Proj QOH. Initially, projected quantity on hand equals the target inventory level. When you change production due, the system recalculates it as:

[(Previous Week's Projected QOH + Production Due) – Sales Forecast]

Coverage. Initially, projected weeks of coverage is the item's average weeks-of-coverage factor. When you change production due, the system recalculates this, using the item's minimum and maximum coverage factors to project inventory shortages (–) and surpluses (+) relative to the average weeks of coverage. An asterisk (*) indicates that projected coverage satisfies the maximum coverage requirement specified in Operations Plan Control (33.1.24).

Reviewing Site Operations Plans

Use three programs to review plans:

- Operations Plan Inquiry (33.15.2) shows an item's site operations plan much as it appears on the Operations Plan Maintenance (33.15.1) screen.
- Operations Plan Summary Report (33.15.3) shows plans for ranges of items, which you can select by starting plan week, product line, item group, item type, and buyer/planner. You can include only items whose projected coverage is greater or less than the average coverage factor.

- Operations Plan Detail Report (33.15.4) shows plan weeks as vertical rather than horizontal columns.

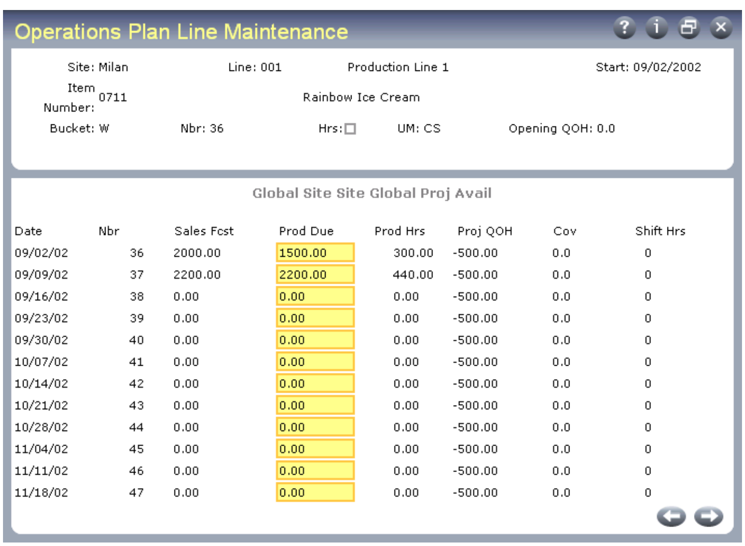
Changing Line Operations Plans

If you are a master scheduler at a supply site, use Operations Plan Line Maintenance (33.15.6) to view global sales forecasts and target inventory levels and to adjust production due quantities for production lines.

The screen can display item information either by calendar week or by general ledger period. If you normally plan in weeks, do not change production quantities in period view. If you do, the system permanently reassigns all weekly quantities to the first week of the period.

By default, the screen displays production due in item quantities, but you can switch to production hours. By default, the screen displays quantities in the inventory unit of measure, but you can change to any other unit of measure.

To delete a plan for an entire year, choose the plan and press Delete. To delete a plan for part of the year, reset the production due quantities to zero for the affected period.


Operations Plan Line Maintenance

Site: Milan Line: 001 Production Line 1 Start: 09/02/2002

Item Number: 0711 Rainbow Ice Cream

Bucket: W Nbr: 36 Hrs: UM: CS Opening QOH: 0.0

Global Site Site Global Proj Avail

Date	Nbr	Sales Fcst	Prod Due	Prod Hrs	Proj QOH	Cov	Shift Hrs
09/02/02	36	2000.00	1500.00	300.00	-500.00	0.0	0
09/09/02	37	2200.00	2200.00	440.00	-500.00	0.0	0
09/16/02	38	0.00	0.00	0.00	-500.00	0.0	0
09/23/02	39	0.00	0.00	0.00	-500.00	0.0	0
09/30/02	40	0.00	0.00	0.00	-500.00	0.0	0
10/07/02	41	0.00	0.00	0.00	-500.00	0.0	0
10/14/02	42	0.00	0.00	0.00	-500.00	0.0	0
10/21/02	43	0.00	0.00	0.00	-500.00	0.0	0
10/28/02	44	0.00	0.00	0.00	-500.00	0.0	0
11/04/02	45	0.00	0.00	0.00	-500.00	0.0	0
11/11/02	46	0.00	0.00	0.00	-500.00	0.0	0
11/18/02	47	0.00	0.00	0.00	-500.00	0.0	0

Fig. 8.5 Operations Plan Line Maintenance (33.15.6)

This program is very similar to Operations Plan Maintenance (33.15.1). It includes several additional fields.

See page 87.

Hrs. Enter Yes to update production hours. Enter No to update production quantities.

Prod Due. Production due quantity for the line. You can update this column if Hrs is No. The system calculates line production due from the site production due, based on the percentages defined in Line Allocation Maintenance (33.5.17). When you change production due, the screen recalculates global projected quantity on hand and weeks of coverage.

Prod Hrs. Projected line production hours for the production due quantity. You can update this column if Hrs is Yes. The system calculates projected production hours as:

Line Production Due Quantity ÷ Hourly Line Production Rate

Production rates are defined in Production Line Maintenance (18.1.1).

Shift Hours. Number of weekly shift hours available for production. The system calculates shift hours based on holidays from Holiday Maintenance (36.2.1) and the shift calendar from Shift Maintenance (18.1.22) or shop calendar from Calendar Maintenance (36.2.5).

Reviewing Line Operations Plans

Use Operations Plan Line Inquiry (33.15.7) to view an item's line operations plan.

Changing Line Schedules

Line Utilization Maintenance (33.15.9) helps you balance the operations plan against available line capacity. You can view and change scheduled production in either hours or quantities. As you make changes, the screen recalculates coverage, capacity, and utilization.

The program includes three screens:

- In the selection screen, you specify the production line and first item and planning week to review.
- In the summary screen, you can review and adjust production schedules for multiple items.
- In the detail screen, you can view additional global plan information on the selected item, as well as adjust production.

Selection Screen

Fig. 8.6
Line Utilization Maintenance (33.15.9), Selection Screen

Site. Enter the supply site code.

Production Line. Enter the code of the production line with production quantities you want to view or update.

Item Number. Enter the end-item number, or leave this field blank to choose all items on the line.

UM. Enter the unit of measure for viewing and changing item quantities. The default unit of measure is the one from the item master record.

Start. Enter the start date for the first calendar week or financial period. The default start date is the system date. If the date you enter is not the Monday of the week or the first day of the period, the system changes it.

Week. Enter the number of the planning week.

Production in Weeks/Dates. Enter W to view production by weeks. Enter D to view production by the Monday date of the week. This option determines the headings in the item summary and item detail screens.

Production in Qty/Hrs. Enter Q to update production quantities. Enter H to update production hours. You can change this option in the item summary and item detail screens.

To move to the summary screen, press Go once. To move to the detail screen, press Go twice.

Item Summary Screen

Table 8.1
Navigating in the Item Summary Screen

Action	Navigation Commands
Switch between production quantities and production hours	Change Qty/Hrs field
Move between item numbers	Page Up or Page Down
Access scheduled line production fields	Enter from Qty/Hrs field
Choose a group of weeks to display	Next, Previous, or Tab
Save and return to Item Number field	Go or Enter from last displayed line production field
Move between line production fields without saving	Next or Previous
Display columns for next four weeks	Tab
Move to item detail screen	Press Go twice from Item Number field

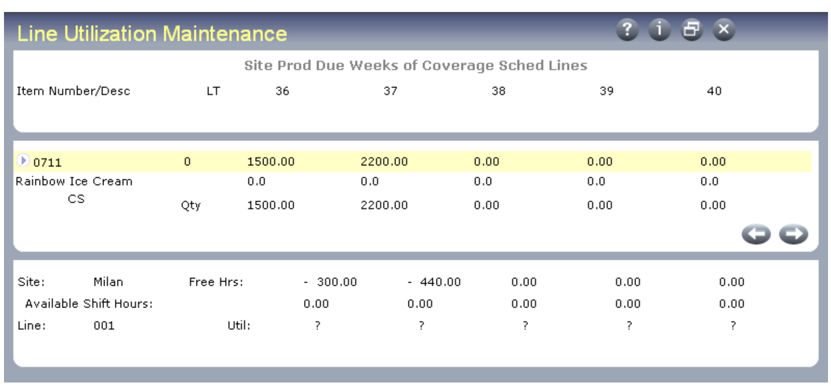


Fig. 8.7
Line Utilization Maintenance, Item Summary Screen

Item Number. Enter the end-item number.

Qty/Hrs. Enter Q to update production quantities. Enter H to update production hours. Afterward, press Enter to access the production schedule fields. Or, press Go to move on to the item detail screen.

LT. The screen displays the item-site's lead time (safety, inspection, purchasing, and manufacturing), which the initial plan calculation used to set production release dates.

Site Production Due. The screen displays the item's production due quantity for the supply site. The system calculates production due as:

[(Sales Forecast + Target Inventory) – Previous Week's Projected QOH]

When you change site production due, the system recalculates projected quantity on hand, weeks of coverage, free/available shift hours, and utilization.

Tip
For the first week, the previous projected QOH equals the opening QOH.

Weeks of Coverage. The screen initially displays the item's average weeks-of-coverage factor. When you change production due, the system recalculates this, using the item's minimum and maximum coverage factors to project inventory shortages (–) and surpluses (+) relative to the average weeks of coverage. An asterisk (*) indicates that projected coverage satisfies the maximum coverage requirement specified in Operations Plan Control (33.1.24).

Sched Line Production. The screen displays production hours or production quantities for the item and line, depending on how you set the Qty/Hrs field. When you change scheduled line production, the screen recalculates free hours, available shift hours, and line utilization.

Site. The screen displays the site code for the production line and item.

Free Hrs. The screen displays the number of shift hours not yet allocated to production. The system calculates free hours as:

(Available Shift Hours – Projected Production Hours)

Available Shift Hours. The screen displays the number of weekly shift hours available for production. The system calculates shift hours based on holidays from Holiday Maintenance (36.2.1) and the shift calendar from Shift Maintenance (18.1.22) or shop calendar from Calendar Maintenance (36.2.5).

Line. The screen displays the production line code.

Util. The screen displays the total line utilization percentage or projected consumption of available production line capacity. The line utilization percentage is:

Line Production Due Qty ÷ Weekly Line Capacity

Line capacity is:

*Available Shift Hours * Line Production Rate*

From the Site Production Due field, press Go or Enter to save your changes and return to the Item Number field.

Item Detail Screen

See page 92.

Navigation in this screen is much the same as in the item summary screen.

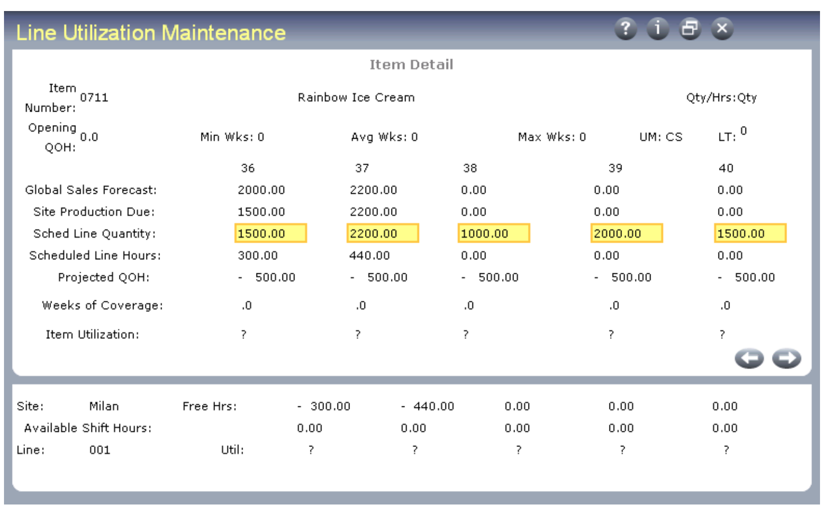


Fig. 8.8
Line Utilization Maintenance, Item Detail Screen

Item Number. Enter the end-item number.

Qty/Hrs. Enter Q to update production quantities. Enter H to update production hours. Afterward, press Enter to access the production schedule fields. Or, press Go to move on to the item detail screen.

Opening QOH. The item's opening on-hand inventory balance.

Min Wks. The item's minimum weeks-of-coverage factor from Coverage by Date Maintenance (33.5.5), if any, or from Weeks of Coverage Maintenance (33.5.1). The system uses this factor to calculate projected inventory shortages.

Avg Wks. The item's average weeks-of-coverage factor from Coverage by Date Maintenance (33.5.5), if any, or from Weeks of Coverage Maintenance (33.5.1).

Max Wks. The item's maximum weeks-of-coverage factor from Coverage by Date Maintenance (33.5.5), if any, or from Weeks of Coverage Maintenance (33.5.1). The system uses this factor to calculate projected inventory surpluses.

UM. The inventory unit of measure from the item master record.

LT. The item-site's lead time (safety, inspection, purchasing, and manufacturing), which the initial plan calculation used to set production release dates.

Global Sales Forecast. The item's consolidated demand from all marketing sites. These global sales forecasts can originate from either end-item sales forecasts or dependent end-item demand calculated by Family Plan Explosion (33.7.14).

Site Production Due. The item's production due quantity for the supply site. The system calculates production due as:

(Sales Forecast + Target Inventory) – Previous Week's Projected QOH

For the first week, the previous projected QOH equals the opening QOH. When you change site production due, the system recalculates projected quantity on hand, weeks of coverage, free/available shift hours, and utilization.

Sched Line Quantity. The item quantity scheduled for the production line for the week or Monday date. The system calculates the line production due using the percentages defined in Line Allocation Maintenance (33.5.17). To update this field, set Qty/Hrs to Qty. When you change the quantity, the system recalculates the global projected quantity on hand, weeks of coverage, item and line utilization, available shift hours and free hours.

Scheduled Line Hours. The number of production hours scheduled for the production line for the week or Monday date. The system calculates projected production hours as:

Line Production Due Quantity ÷ Hourly Line Production Rate

Hourly line production rates are defined in Production Line Maintenance (18.1.1). To update this field, set Qty/Hrs to Hrs. When you change the hours, the system recalculates the global projected quantity on hand, weeks of coverage, item and line utilization, available shift hours and free hours.

Projected QOH. The item's global projected on-hand inventory quantity. The system calculates projected quantity on hand as:

(Previous Week's Projected QOH + Production Due) – Sales Forecast

For the first week, the projected QOH is the opening QOH.

Weeks of Coverage. The screen initially displays the item's average weeks-of-coverage factor. When you change production due, the system recalculates this, using the item's minimum and maximum coverage factors to project inventory shortages (–) and surpluses (+) relative to the average weeks of coverage. An asterisk (*) indicates that projected coverage satisfies the maximum coverage requirement specified in Operations Plan Control (33.1.24).

Item Utilization. The percentage of total available line capacity currently utilized by this item. The system recalculates this if you change Sched Line Qty or Sched Line Hrs.

Site. The site code for the production line and item.

Free Hrs. The number of shift hours not yet allocated to production. The system calculates free hours as:

Available Shift Hours – Projected Production Hours

Available Shift Hours. The number of weekly shift hours available for production. The system calculates shift hours based on holidays from Holiday Maintenance (36.2.1) and the shift calendar from Shift Maintenance (18.1.22) or shop calendar from Calendar Maintenance (36.2.5).

Line. The production line code.

Util. The total line utilization percentage or projected consumption of available production line capacity. The line utilization percentage is:

Line Production Due Qty ÷ Weekly Line Capacity

Line capacity is:

*Available Shift Hours * Line Production Rate*

From any scheduled line field, press Go or Enter to save your changes and return to the item summary screen.

Reviewing Line Schedules

Line Utilization Summary Report (33.15.10) shows line scheduling information for a range of sites and production lines. You can print production due in either item quantities or line production hours.

Reviewing Projected Inventory Coverage

Two reports show data on projected inventory coverage.

- Coverage Detail Report (33.15.19) has three columns that group operations plan data by week. Each column shows global sales forecasts, site production due, global projected quantity on hand, and global weeks of coverage.
- Coverage Summary Report (33.15.20) has three columns that group operations plan data by category. Each column shows global sales forecasts, site production due, and global weeks of coverage.

Both reports show up to three weeks of data plus opening quantity on hand for each item, and both sort and total by product line, item group, and item.

Reviewing Site Utilization

Site Utilization Inquiry (33.15.12) shows line utilization for one or all production lines in a site.

Reviewing Production Labor Hours

Production Labor Inquiry (33.15.11) shows projected labor hours required to execute scheduled line production. This inquiry calculates total site labor hours based on the run crew size specified in Production Line Maintenance (18.1.1).

Chapter 9

Transfer of Production Demands

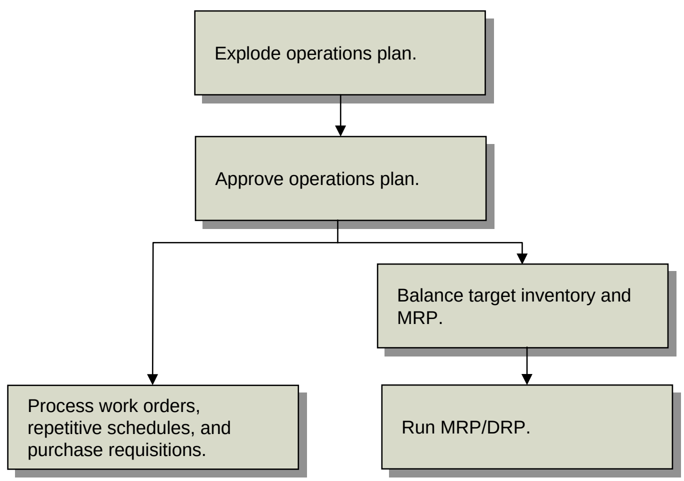
This chapter describes how to transfer operations plan production demands to work orders, purchase requisitions, and repetitive schedules. It also describes activities required for subsequent processing by MRP/DRP.

Introduction

The operations plan is the equivalent of a master production schedule. Once you are satisfied with the plan, you can transfer control of the production demands directly into the processing cycles of other modules in QAD 2007. You can approve production demands as work orders, repetitive schedules, or purchase requisitions. This saves time, minimizes downstream processing, and decreases the likelihood of errors.

Figure 9.1 shows the work flow for transferring the operations plan.

Fig. 9.1
Transfer Work Flow



Exploding the Operations Plan into Orders

You must explode the production demands calculated in the operations plan to the supply sites that will manufacture or purchase the items.

Figure 9.2 shows the explosion calculation. For most items, the explosion creates firm planned orders for the production due quantities in the operations plan.

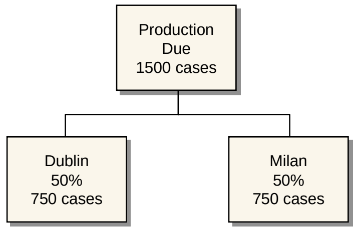


Fig. 9.2 Explosion Calculation

For co-product and by-product items, the explosion creates batch work orders (Status B) for the base process. The explosion does not create work orders for co-products or by-products. When you change the work order status from B to F, the system generates firm planned work order sets for the co-products and by-products associated with the base process.

Outside of the Enterprise Operations Plan module, these orders have the status firm planned. The system distinguishes operations plan orders from other orders by a special remark (OpsPlan). In form and function, these orders resemble master schedule orders.

However, within the Enterprise Operations Plan module, these orders behave more like MRP planned orders—that is, subsequent operations plan explosions will still add, delete, or change them.

The explosion assigns the orders to the supply sites designated in the item source matrix. It sets order due dates to the Monday of the week. It calculates release dates by offsetting item lead times from the due date.

Note The explosion transfers information only to sites in connected QAD 2007 databases. To distribute orders to non-QAD 2007 databases, send the output to a file. You can then translate this file to Open Application Group (OAG) or Application Linking and Embedding (ALE) standards.

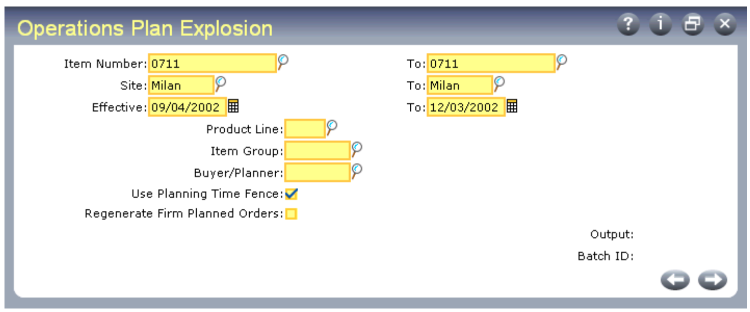
Running Operations Plan Explosion

Use Operations Plan Explosion (33.15.13) to explode the operations plan. Whenever you change the operations plan, rerun the explosion to change the original records and create new firm planned orders. You can rerun the explosion as often as necessary. Subsequent explosions ignore previously approved items.

To review or change orders generated by the explosion, use the Work Orders module. For base process items, run Multiple WO Status Change (16.8) to change the order status from batch (B) to firm planned (F). This generates the firm planned orders for co-products and by-products associated with the base process. You must change the work order status before you can approve these orders in the Enterprise Operations Plan module.

Exploded orders also update projected quantity on hand, planned orders due, and planned order release quantities in MRP records. To review MRP records after an explosion, use one of the inquiries or reports in the Material Requirements Plan module.

Fig. 9.3
Operations Plan Explosion (33.15.13)



Item Number/To. Enter the item number range.

Site/To. Enter the site range.

Effective/To. Enter the effective date range. When you specify a non-Monday start date or a non-Sunday end date, the system changes it.

Product Line. If you specify a value, the system processes only items belonging to this product line.

Item Group. If you specify a value, the system processes only items belonging to this item group.

Buyer/Planner. If you specify a value, the system processes only items assigned to this person.

Use Planning Time Fence. Enter Yes to prevent the explosion from recalculating production quantities due within the item-site time fence period. This setting protects the master schedule against last-minute orders with a cumulative lead time that exceeds the available production time. Enter No to permit recalculations.

Regenerate Firm Planned Orders. Enter Yes to regenerate operations plan orders created by earlier explosions. Enter No to run a net-change explosion. If you run the explosion and later change production due quantities in the operations plan, the system automatically updates production quantities on the corresponding orders, regardless of how you set this option. The system also updates the orders if you change the order due date or release date. However, the system does not update orders if you change other information that affects them, such as item lead times. Whenever you make changes like these, enter Yes.

Approving Orders to Other Modules

Once the production demands are exploded to the supply sites, they are almost ready for manufacturing and purchasing.

The last step is for each supply site to approve its exploded work orders. Approval freezes order quantities against subsequent replanning by operations planning. Approval also converts the demands to the correct form for subsequent manufacturing or purchasing activity—that is, to firm planned work orders, repetitive schedules, or purchase requisitions.

Many companies have a management authorization process for production demands. Manufacturing and purchasing can process these demands only after management has reviewed and approved them. Generally, you approve orders with due dates that are inside the item time fence.

In multi-database environments, local schedulers approve orders from the central planning database. The system automatically switches to the local planning database.

Important Approval is irreversible. Once you approve an operations plan order, you cannot change or re-explode it. To restrict unauthorized access, set up menu security.

See *User Guide Volume 9: Manager Functions* for security details.

Approval converts the operations plan firm planned orders into one of three formats:

See *User Guide Volume 3: Manufacturing* for details on work orders and repetitive.

- Firm planned work orders. The approval updates the existing exploded firm planned orders to prevent subsequent plan explosions from changing them. It also changes the work order remark to Ops Plan Approved.
- Repetitive schedules. The approval places each week's production quantities into a repetitive schedule due on the Monday of the week. You must then manually redistribute this quantity across the rest of the week.

  Repetitive schedule approvals overwrite existing repetitive schedule quantities for the Mondays of the weeks. However, they do not overwrite quantities for the remaining days of the weeks.

See *User Guide Volume 2A: Distribution* for details on purchase requisitions.

- Purchase requisitions. The approval generates purchase requisitions, which you can later convert to purchase orders.

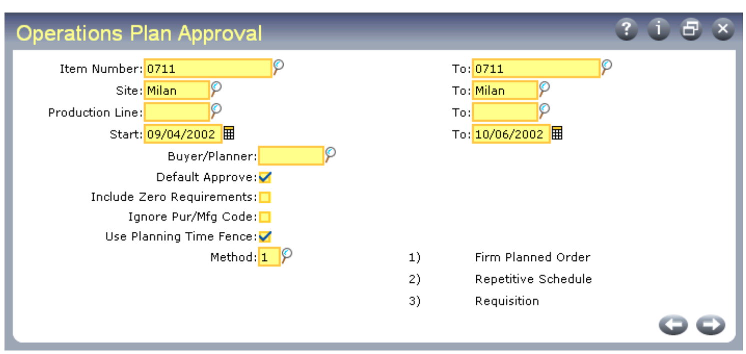
Running Operations Plan Approval

Use Operations Plan Approval (33.15.14) to approve individual orders or items in a chosen range. There are two frames:

- In the first, choose groups of orders for approval.
- In the second, modify the selection for individual orders.

After approval, adjust due dates, release dates, quantities, or other information with the appropriate maintenance programs in the Work Orders, Repetitive, or Purchasing module.

Fig. 9.4 Operations Plan Approval (33.15.14), Selection Criteria



Item Number/To. Enter the item number range.

Site/To. Enter the site range.

Production Line/To. Enter the production line range.

Start/To. Enter the effective date range. When you specify a non-Monday start date or a non-Sunday end date, the system changes it. Enter the effective date range for the load. When you specify a non-Monday start date or a non-Sunday end date, the system changes it. To load inventory quantities for a planning week, you must set the effective date to the Monday of the previous week.

Tip
The ending inventory of the prior week becomes the beginning projected available inventory for the current planning week.

Buyer/Planner. If you specify a value, the system processes only items assigned to this person.

Default Approve. Enter Yes to approve most or all orders. You can exclude individual orders in the second approval screen. Enter No to choose orders manually.

Include Zero Requirements. Enter No to exclude zero-quantity work orders. Enter Yes to include them.

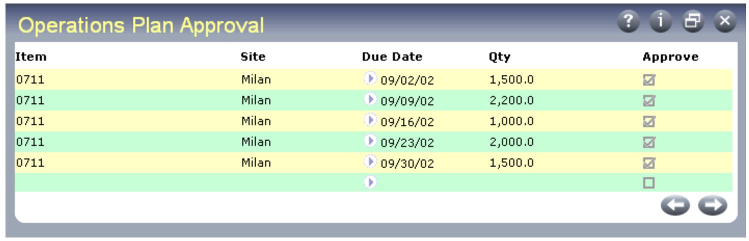
Ignore Pur/Mfg Code. Enter No to approve orders only to formats appropriate for the item master purchase/manufacture code, and to choose only orders appropriate for the approval method. Enter Yes to approve all orders.

Use Planning Time Fence. Enter Yes to choose only orders due in the immediate future. Enter No to choose all orders regardless of due date.

Method. Enter 1 to approve operations plan orders as firm planned work orders, 2 to approve orders as repetitive schedules, or 3 to approve orders as purchase requisitions. To prevent the system from approving orders to formats inappropriate for their item purchase/manufacture code, set Ignore Pur/Mfg Code to No.

Press Go to proceed to the order selection screen.

Fig. 9.5
Operations Plan Approval (33.15.14), Order Selection



Running Operations Plan Batch Approval

Use Operations Plan Batch Approval (33.15.15) to approve ranges of orders in batch. This program is similar to Operations Plan Approval, but only one frame displays and it includes an Output and Batch ID field.

Balancing Target Inventory Levels and MRP

Before you run MRP/DRP, you must compensate for a gap between operations planning and MRP/DRP processing—target inventory. If you do not, MRP/DRP will later generate erroneous order cancellation messages in supply sites.

Operations planning generates orders for both sales forecasts and target inventory. But MRP/DRP generates orders only for sales forecasts. When it encounters target inventory orders, it cannot link them back to specific sales forecasts.

To prevent the error messages, you must usually run Balance Target Inventory and MRP (33.15.17) after you explode the operations plan. Run this utility for all marketing sites, in all QAD 2007 databases that run MRP/DRP.

Note You do not need to run the utility for items with an average weeks-of-coverage factor of zero. There is always a one-to-one correspondence between each week's target inventory levels and sales forecasts.

The utility generates seasonal build demands for the marketing site. The seasonal build quantity matches the target inventory level. The combined sales forecast plus seasonal build equals the MRP planned orders for the operations planning production demands.

After running the utility, you can use Seasonal Build Maintenance (22.9) to adjust seasonal build quantities or other information.

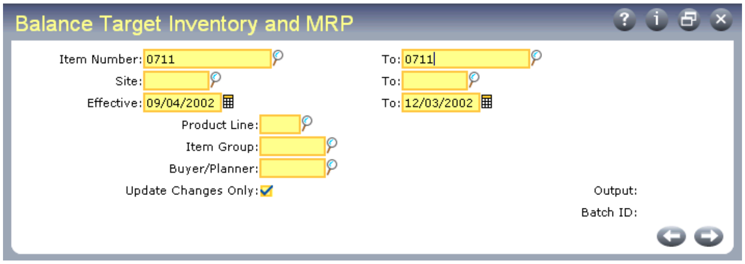


Fig. 9.6
Balance Target Inventory and MRP (33.15.17)

Item Number/To. Enter the item number range.

Site/To. Enter the site range.

Effective/To. Enter the effective date range. When you specify a non-Monday start date or a non-Sunday end date, the system changes it.

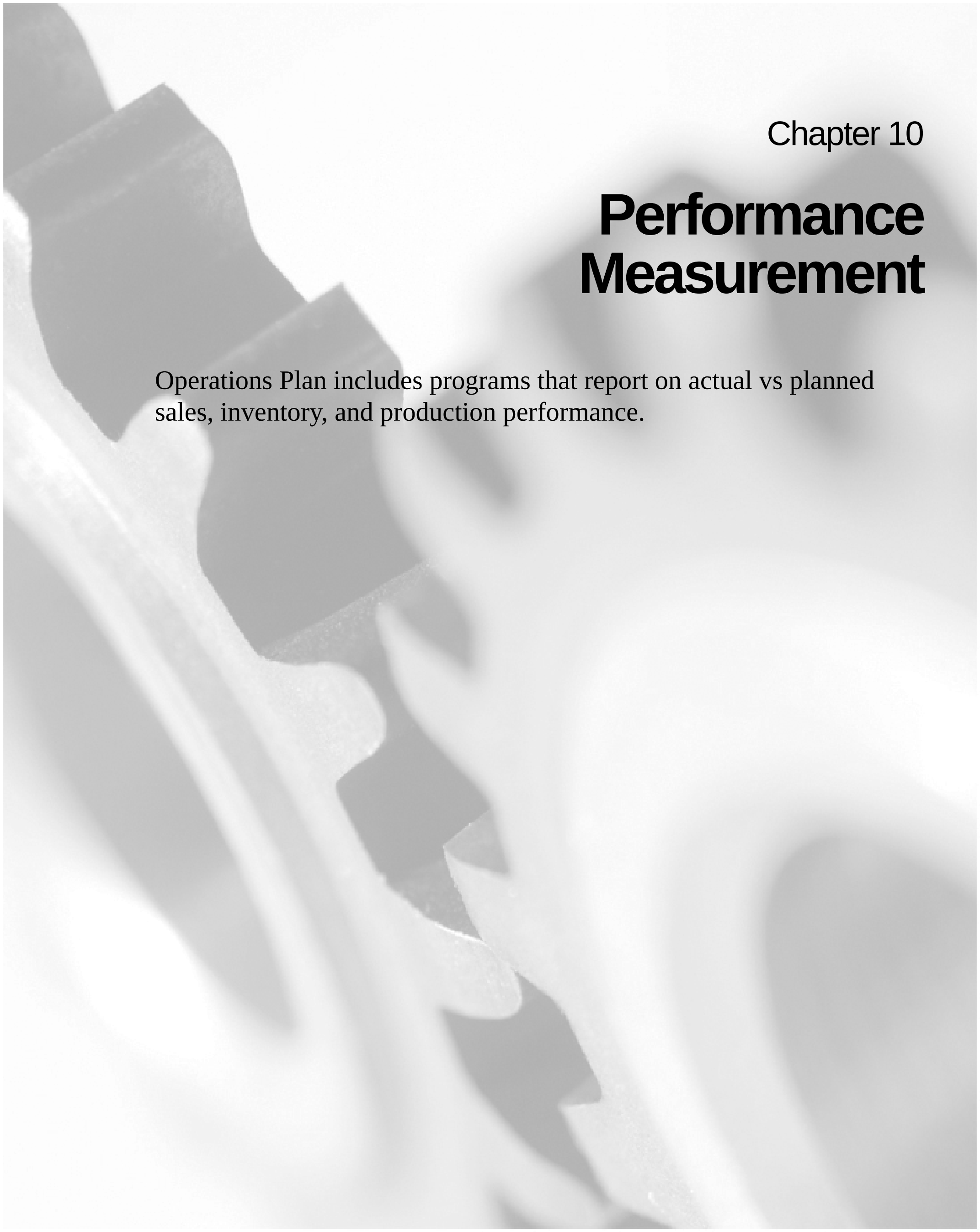
Product Line. If you specify a value, the system processes only items belonging to this product line.

Item Group. If you specify a value, the system processes only items belonging to this item group.

Buyer/Planner. If you specify a value, the system processes only items assigned to this person.

Update Changes Only. Enter Yes to prevent the utility from duplicating previously created seasonal build quantities. Enter No only if you must re-create seasonal build quantities.

Tip
Specify Yes if you rerun the utility for a planning period.



Chapter 10

Performance Measurement

Operations Plan includes programs that report on actual vs planned sales, inventory, and production performance.

At the departmental level, sales and marketing managers want to know how accurately they forecasted sales. Inventory managers want to know whether actual balances were in line with target levels. Production managers want to know whether actual production met the projected requirement. At the corporate level, master schedulers want to see global and site-level family and end-item sales, inventory, and production.

After you have rolled up end-item changes to the family plan, you can use several inquiries and reports to track performance in these areas.

Reviewing Actual vs Planned Sales

- Sales Data Inquiry (33.19.1) shows sales forecasts, actual sales, and variances for individual item-sites. You can use this inquiry for both family items and end items. You can view quantities by week or fiscal period and in any item unit of measure.
- Sales Data Report (33.19.2) shows the same information for ranges of items, sites, and planning periods.

Reviewing Actual vs Planned Inventory

- Inventory Data Inquiry (33.19.4) shows target inventory, actual quantity on hand, and variances for individual item-sites. You can use this inquiry for both family items and end items. You can view quantities by week or fiscal period and in any item unit of measure.
- Inventory Data Report (33.19.5) shows the same information for ranges of items, sites, and planning periods.

Reviewing Actual vs Planned Production

- Production Data Inquiry (33.19.7) shows production due, actual production, and variances for individual item-sites. You can use this inquiry for both family items and end items. You can view quantities by week or fiscal period and in any item unit of measure.
- Production Data Report (33.19.8) shows the same information for ranges of items, sites, and planning periods.

Reviewing Global Actual vs Planned Performance

- Performance Inquiry (33.19.13) shows actual, planned, and variance quantities for sales, inventory, and production. You can use this inquiry for both family items and end items. You can view quantities by week or fiscal period, and in any item unit of measure.
- Performance Report (33.19.14) is similar but shows information for ranges of items, sites, and planning periods.

Chapter 11

Simulation Planning

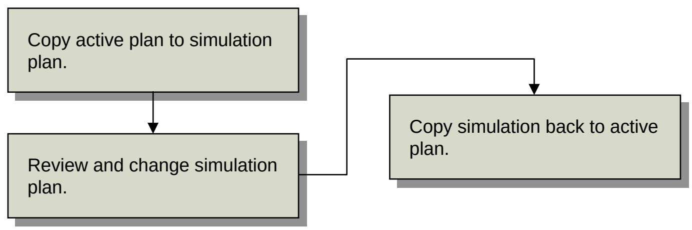
This chapter describes activities required to generate and maintain simulation plans for family items and end items.

Introduction

During the plan review process, it can be helpful to experiment with the effects of changing production due quantities. You can create simulations of both family and operations plans.

Figure 11.1 shows the simulation planning work flow.

Fig. 11.1 Simulation Planning Work Flow



Creating Simulation Plans

To create simulation plans from an active family plan, operations plan, or another simulation plan, use Copy Plan to Simulation (33.17.1). This program copies sales forecasts, target inventory levels, and production due quantities. However, it does not copy projected quantity on hand or weeks of coverage. When you change quantities in the simulation plan maintenance programs, the system recalculates these.

Note You cannot change weeks of coverage or other plan calculation factors in full-scale simulation mode. However, you can save the active plan to a simulation table, change the factors and recalculate the plan. Then, if necessary, copy the stored plan back. Obviously, if you do this, you must institute appropriate procedural controls.

You can generate an unlimited number of simulation plans.

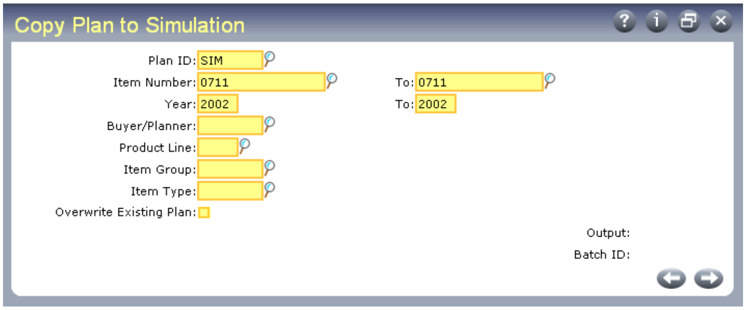


Fig. 11.2 Copy Plan to Simulation (33.17.1)

Plan ID. Enter a code (maximum eight characters) to identify the simulation plan.

Item Number/To. Enter the item number range.

Year/To. Enter a maximum range of three calendar years, starting with the current year.

Buyer/Planner. If you specify a value, the system processes only items assigned to this person.

Product Line. If you specify a value, the system processes only items belonging to this product line.

Item Group. If you specify a value, the system processes only items belonging to this item group.

Item Type. If you specify a value, the system processes only items belonging to this item type.

Overwrite Existing Plan. Enter Yes to overwrite previously generated simulation plan records for the selected items, plan years, and so on. Enter No to preserve the previous plan records in the new simulation plan.

Maintaining Simulation Plans

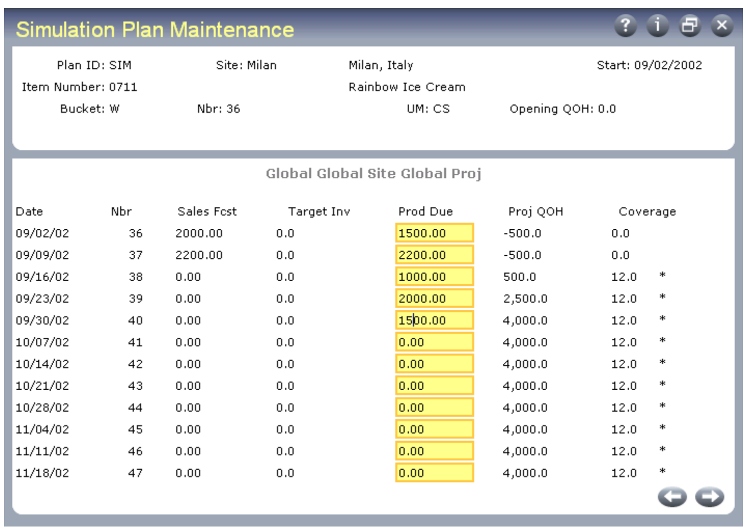
Like operations plans, you can manipulate simulation plans at the site and production line levels.

Changing Site Simulation Plans

To view the plan and simulate changes to production due quantities, use Simulation Plan Maintenance (33.17.13). To help you make more informed decisions, the screen displays the global sales forecasts and global target inventory levels. As you change quantities, the system recalculates projected quantity on hand and projected weeks of coverage.

You can also use Simulation Plan Maintenance to delete a simulation plan, either for an entire year, or for only specific periods within the year. For example, you may have to do this if an item becomes obsolete.

Fig. 11.3
Simulation Plan Maintenance (33.17.13)



See “Changing Site Operations Plans” on page 86.

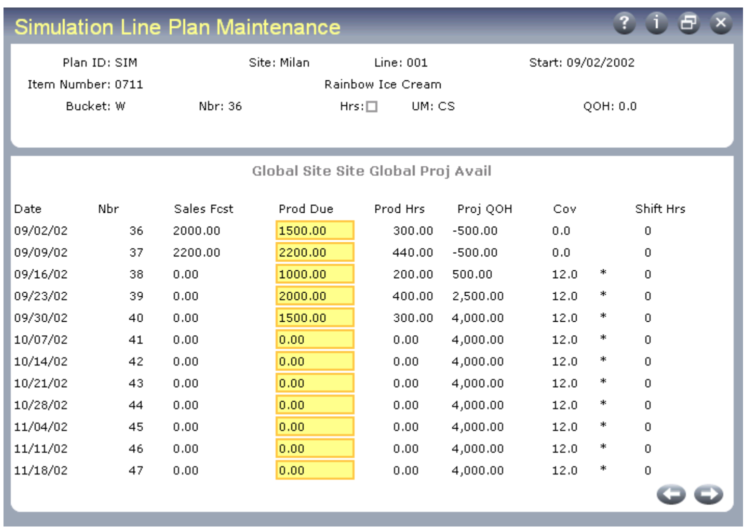
The fields in Simulation Plan Maintenance are identical to those in Operations Plan Maintenance.

Use two programs to view simulated plan information:

- Simulation Plan Inquiry (33.17.14) shows an item's site simulation plan much as it appears on the Simulation Plan Maintenance (33.17.13) screen.
- Simulation Summary Report (33.17.6) shows plans for ranges of items, which you can choose by starting plan week, product line, item group, item type, and buyer/planner. You can limit the report to items whose projected coverage is greater or less than the average coverage factor.

Changing Line Simulation Plans

Use Simulation Line Plan Maintenance (33.17.16) to view the plan and simulate changes to production due quantities at the production line level.


Simulation Line Plan Maintenance

Plan ID: SIM Site: Milan Line: 001 Start: 09/02/2002
Item Number: 0711 Rainbow Ice Cream
Bucket: W Nbr: 36 Hrs: UM: CS QOH: 0.0

Global Site Site Global Proj Avail

Date	Nbr	Sales Fcst	Prod Due	Prod Hrs	Proj QOH	Cov		Shift Hrs
09/02/02	36	2000.00	1500.00	300.00	-500.00	0.0		0
09/09/02	37	2200.00	2200.00	440.00	-500.00	0.0		0
09/16/02	38	0.00	1000.00	200.00	500.00	12.0	*	0
09/23/02	39	0.00	2000.00	400.00	2,500.00	12.0	*	0
09/30/02	40	0.00	1500.00	300.00	4,000.00	12.0	*	0
10/07/02	41	0.00	0.00	0.00	4,000.00	12.0	*	0
10/14/02	42	0.00	0.00	0.00	4,000.00	12.0	*	0
10/21/02	43	0.00	0.00	0.00	4,000.00	12.0	*	0
10/28/02	44	0.00	0.00	0.00	4,000.00	12.0	*	0
11/04/02	45	0.00	0.00	0.00	4,000.00	12.0	*	0
11/11/02	46	0.00	0.00	0.00	4,000.00	12.0	*	0
11/18/02	47	0.00	0.00	0.00	4,000.00	12.0	*	0

Fig. 11.4 Simulation Line Plan Maintenance (33.17.16)

The fields in Simulation Line Plan Maintenance are identical to those in Operations Plan Line Maintenance.

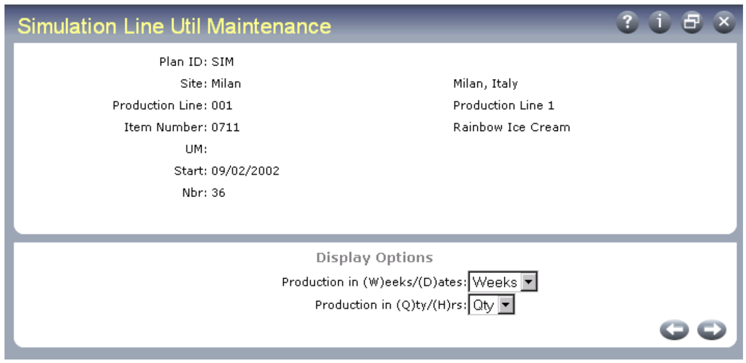
See "Changing Line Operations Plans" on page 89.

Use Simulation Line Plan Inquiry (33.17.17) to display an item's line simulation plan.

Changing Simulation Line Schedules

Simulation Line Util Maintenance (33.17.19) simulates balancing the operations plan against available line capacity. You can view and change scheduled production in either hours or quantities. As you make changes, the screen recalculates coverage, capacity, and utilization.

Fig. 11.5
Simulation Line Utilization Maintenance (33.17.19)



See “Changing Line Schedules” on page 90.

The multiple screens and fields in the program are identical to those in Line Utilization Maintenance.

Simulation Line Util Report (33.17.20) shows line scheduling information for a range of sites and production lines. You can print production due in either item quantities or line production hours.

Copying Simulation Plans to Active Plans

When you are satisfied with a simulation plan, use Copy Simulation to Plan (33.17.3) to copy the plan back over the active family plan or operations plan.

Note Be careful not to copy the simulation plan prematurely or in error. The system does not keep a backup copy of the old active plan.

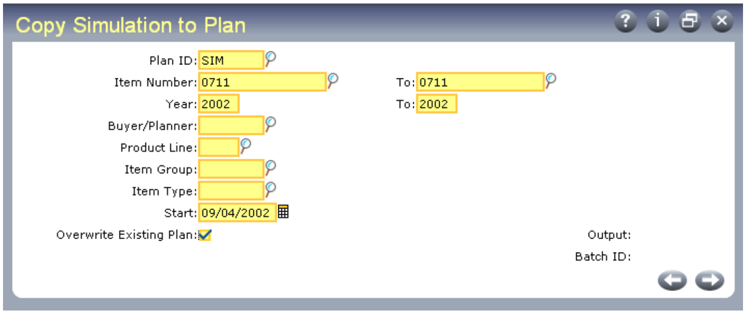


Fig. 11.6
Copy Simulation to Plan (33.17.3)

Plan ID. Enter a code (maximum eight characters) to identify the simulation plan.

Item Number/To. Enter the item number range.

Year/To. Enter a maximum range of three calendar years, starting with the current year.

Buyer/Planner. If you specify a value, the system processes only items assigned to this person.

Product Line. If you specify a value, the system processes only items belonging to this product line.

Item Group. If you specify a value, the system processes only items belonging to this item group.

Item Type. If you specify a value, the system processes only items belonging to this item type.

Overwrite Existing Plan. Enter Yes to overwrite previously generated simulation plan records for the selected items, plan years, and so on. Enter No to preserve the previous plan records in the new simulation plan.

Chapter 12

System Administration

This chapter describes general steps for updating records and preserving database space.

Introduction

Periodically, you should perform certain tasks to update records and to preserve database space.

- When you change certain records in other QAD 2007 modules, or whenever certain conditions change in your company, you must update operations planning master data.
- Typically at year-end, you should delete and optionally archive obsolete plan records.
- If inconsistencies develop between global and site-level quantities, you must run a utility program to correct the problem.

This chapter outlines these procedures.

Maintaining Static Data

When your company changes item numbers, intersite sourcing relationships, and so on, you must update records in the Enterprise Ops Plan module. Table 12.1 lists events that require such updates.

Table 12.1 Events Requiring Operations Plan Record Updates

Event	Update Operations Plan Records in
Item numbers change	Family Hierarchy Change (33.3.6)
	Family Item Cost Maintenance (33.3.13)
	Weeks of Coverage Maintenance (33.5.1)
	Coverage by Date Maintenance (33.5.5)
	Source Matrix Maintenance (33.5.13)
	Line Allocation Maintenance (33.5.17)
	Item Pallet Maintenance (33.5.23)
Item records are added or deleted	Family Hierarchy Maintenance (33.3.1)
	Family Item Cost Maintenance (33.3.13)
	Weeks of Coverage Maintenance (33.5.1)
	Coverage by Date Maintenance (33.5.5)
	Source Matrix Maintenance (33.5.13)
	Line Allocation Maintenance (33.5.17)
	Item Pallet Maintenance (33.5.23)

Event	Update Operations Plan Records in
Target inventory levels change	Weeks of Coverage Maintenance (33.5.1)
	Coverage by Date Maintenance (33.5.5)
Intersite sourcing relationships change	Source Matrix Maintenance (33.5.13)
Intrasite production line relationships change	Line Allocation Maintenance (33.5.17)

At year-end, additional activities are required:

- Verify that records in Family Hierarchy Maintenance (33.3.1) and Source Matrix Maintenance (33.5.13) are still valid for the remainder of your planning horizon. Update the end dates as necessary.
- Rerun Calendar Cross-Reference Build (33.1.4) for the remainder of your planning horizon (up to three years).

See Chapter 3, “Required Implementation,” on page 21 and Chapter 4, “Family Data Implementation,” on page 31.

Deleting Old Data

The system does not automatically delete old operations planning records. To preserve disk space, you should periodically remove outdated records.

Table 12.2 Records To Be Periodically Deleted

Data	Program
Family hierarchies	Family Hierarchy Delete/Archive (33.3.23)
Family plans	Operations Plan Delete/Archive (33.15.23)
Data loaded into Item-Site Data Maintenance (33.13.3)	Item-Site Data Consolidation (33.13.6), Delete Item-Site Load Records option
Operations plans	Operations Plan Delete/Archive (33.15.23)
Work orders generated by Operations Plan Explosion (33.15.13)	Work Order Delete/Archive (16.23)
Simulation plans	Simulation Delete/Archive (33.17.23)

Do not remove records until all processing is complete for the planning period. When selecting data to delete/archive, consider how you want to manage restorations.

Example If you delete/archive an entire year’s history, you must reload the entire file even if you only need data for a day or week.

Establish procedures to handle archive files. Keep a separate record of the file name and contents because there is no label within the file. The ASCII file name identifies only the module and the file creation date. Then, if you later reload the data, you will know which file to load from.

Note Set up security for delete/archive programs. The system does not maintain an audit trail of deleted records.

Delete. Enter Yes to delete the selected records. Enter No to print a report of records to delete. Before deleting records, run this program with Delete set to No. Review the report, then rerun the program with Delete set to Yes.

Archive. Enter Yes to copy deleted records to a disk file to be stored off-line. If you ever need to restore data, copy the file back to disk. Then, use Archive File Reload (36.16.5) to reload the file.

Archive File. The Archive option generates an ASCII file called xxYYMMDD.hst, where xx is the record type and YYMMDD is the delete/archive date. If you already ran the delete/archive for this date, the system appends to the existing file.

Recalculating Summary Records

After a database crash or other such event, the system can develop inconsistencies between an item's site-level and global quantities. If this happens, use Recalculate Summary Records (33.25.1) to rebuild family plan and operations plan summary records.

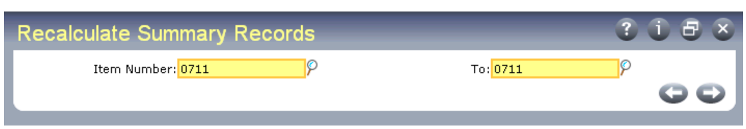


Fig. 12.1
Recalculate Summary Records (33.25.1)

Chapter 13

Operations Plan Examples

This chapter gives two examples: a family plan example illustrating consolidation, explosion, and rollup calculations; and an operations plan example illustrating supply site and production line calculations.

Family Plan Example

This example illustrates consolidation, explosion, and rollup calculations for a family plan. Calculations are shown by planning week.

Global Consolidation

For each week with sales forecasts, Global Consolidation (33.7.1) calculates global forecasts by totaling family forecasts from marketing sites. Family forecasts can either be recorded directly or rolled up from end-item forecasts.

Table 13.1
Global Forecasts Calculations

Week	Site A Forecasts	Site B Forecasts	Global Forecasts
1	0	0	0
2	100	150	250
3	200	300	500
4	100	200	300
5	150	250	400
6	150	150	300
7	150	150	300
8	175	225	400
9	200	225	425
10	0	0	0
11	0	0	0
12	0	0	0

The consolidation uses the item's average weeks-of-coverage factor (2.0) to calculate global target inventory levels. Therefore, each week's global target inventory equals the sum of the next two weeks of sales forecasts.

Table 13.2
Global Target Inventory Calculations

Week	Global Forecasts	Global Target Inventory Levels
1	0	250 + 500 = 750
2	250	500 + 300 = 800
3	500	300 + 400 = 700
4	300	400 + 300 = 700

Week	Global Forecasts	Global Target Inventory Levels
5	400	300 + 300 = 600
6	300	300 + 400 = 700
7	300	400 + 425 = 825
8	400	425 + 0 = 425
9	425	0
10	0	0
11	0	0
12	0	0

The consolidation calculates global production due as:

(Sales Forecast + Target Inventory) – Previous Projected Quantity on Hand.

For family-level planning, the initial opening quantity on hand is always zero. For subsequent weeks, the previous week's quantity on hand equals the target inventory level.

Table 13.3 Gross Production Due Calculations

Week	Sales Forecast	Target Inventory	Projected QOH	Gross Production Due
1	0	750	0	(0 + 750) – 0 = 750
2	250	800	750	(250 + 800) – 750 = 300
3	500	700	800	(500 + 700) – 800 = 400
4	300	700	700	(300 + 700) – 700 = 300
5	400	600	700	(400 + 600) – 700 = 300
6	300	700	600	(300 + 700) – 600 = 400
7	300	825	700	(300 + 825) – 700 = 425
8	400	425	825	(400 + 425) – 825 = 0
9	425	0	425	(425 + 0) – 425 = 0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0

The consolidation initially calculates projected quantity on hand to equal the target inventory level. However, if you change production due, the system recalculates it as:

Previous Week's Projected QOH + Production Due) – Sales Forecast

If production due for the first week increases from 750 to 900. The system recalculates quantities as follows.

Table 13.4 Projected Quantities on Hand Calculations

Week	Previous QOH	Production Due	Sales Forecast	Projected QOH
1	0	900	0	(0 + 900) – 0 = 900
2	900	300	250	(900 + 300) – 250 = 950
3	950	400	500	(950 + 400) – 500 = 850
4	850	300	300	(850 + 300) – 300 = 850
5	850	300	400	(850 + 300) – 400 = 750
6	750	400	300	(750 + 400) – 300 = 850
7	850	425	300	(850 + 425) – 300 = 975
8	975	0	400	(975 + 0) – 400 = 575
9	575	0	425	(575 + 0) – 425 = 150
10	150	0	0	(150 + 0) – 0 = 150
11	150	0	0	(150 + 0) – 0 = 150
12	150	0	0	(150 + 0) – 0 = 150

The consolidation initially calculates projected weeks of coverage as the family item's average weeks-of-coverage factor. But the system recalculates it when you change production due.

For each week, the system subtracts the forecast for each upcoming week, until it encounters a week for which the on-hand quantity is insufficient to cover the forecast. It then divides the remaining inventory by the sales forecast for that week. Finally, it calculates the weeks of coverage by totaling the number of complete weeks and the decimal for the partial week.

Table 13.5
Projected Weeks of Coverage Calculations

Week	Projected QOH	Sales Forecast	Projected Weeks of Coverage
1	900	0	900 – 250 = 650 650 – 500 = 150 150 ÷ 300 = 0.5 2.5 weeks
2	950	250	950 – 500 = 450 450 – 300 = 150 150 ÷ 400 = 0.375 ~ 2.4 weeks
3	850	500	850 – 300 = 550 550 – 400 = 150 150 ÷ 300 = 0.5 2.5 weeks
4	850	300	850 – 400 = 450 450 – 300 = 150 150 ÷ 300 = 0.5 2.5 weeks
5	750	400	750 – 300 = 450 450 – 300 = 150 150 ÷ 400 = 0.375 ~ 2.4 weeks
6	850	300	850 – 300 = 550 550 – 400 = 150 150 ÷ 425 = 0.353 ~ 2.4 weeks
7	975	300	*
8	575	400	*
9	150	425	*
10	150	0	*
11	150	0	*
12	150	0	*

* Maximum weeks of coverage specified in Operations Plan Control (33.1.24).

Family Plan Explosion

Family Plan Explosion (33.7.14) calculates dependent end-item demands for family item gross production due quantities. To do this, it uses either the planned or calculated forecast percentage for the subfamily, which you specify when you run the explosion. Once you select this percentage, however, the calculations are the same.

Table 13.6 shows gross production due if 25% of the forecast is for subfamily A and the remaining 75% for subfamily B.

Table 13.6
Gross Production Calculations

Week	Gross Production	Gross Production Subfamily A	Gross Production Subfamily B
1	900	900 * 25% = 225	900 * 75% = 675
2	300	300 * 25% = 75	300 * 75% = 225
3	400	400 * 25% = 100	400 * 75% = 300
4	300	300 * 25% = 75	300 * 75% = 225
5	300	300 * 25% = 75	300 * 75% = 225
6	400	400 * 25% = 100	400 * 75% = 300
7	425	425 * 25% = 106.25	425 * 75% = 318.75
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0

Whenever units of measure vary between family and subfamily levels, the explosion converts quantities to the unit for the lower level. In this example, the family unit is metric tons, and the end-item unit is cases. A case weighs 36 kilos, so the unit-of-measure conversion factors are 1 CS = 0.036 TN and 1 TN = 27.78 CS.

Table 13.7 Gross Production Calculations for Subfamily A

Week	Family Gross Production (TN)	Gross Production Subfamily A (CS)
1	225	225 * 27.778 = ~ 6,250
2	75	75 * 27.778 = ~ 2,083
3	100	100 * 27.778 = ~ 2,778
4	75	75 * 27.778 = ~ 2,083
5	75	75 * 27.778 = ~ 2,083
6	100	100 * 27.778 = ~ 2,778
7	106.25	106.25 * 27.778 = ~ 2,951
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0

Table 13.8 Gross Production Calculations for Subfamily B

Week	Family Gross Production (TN)	Gross Production Subfamily B (CS)
1	675	675 * 27.778 = ~ 18,750
2	225	225 * 27.778 = ~ 6,250
3	300	300 * 27.778 = ~ 8,333
4	225	225 * 27.778 = ~ 6,250
5	225	225 * 27.778 = ~ 6,250
6	300	300 * 27.778 = ~ 8,333
7	318.75	318.75 * 27.778 = ~ 8,854
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0

The system stores dependent end-item demands as sales forecasts. Source Matrix Explosion (33.13.8) uses these forecasts to calculate the end-item operations plan.

Family Plan Rollup

Family Plan Rollup (33.7.13) updates the family plan when you change end-item information—for example, when you change production due quantities. In this example, production due for the first week increases from 6,250 to 6,500 cases.

The rollup works much like Family Plan Explosion (33.7.14), only in reverse. It starts by converting the end-item quantity back to the family item unit of measure.

Table 13.9
Family Plan Explosion Calculations for Subfamily A

Week	End Item Production Due (CS)	Gross Production Subfamily A (TN)
1	6,500	6,500 ÷ 27.778 = ~ 234
2	2,083	2,083 ÷ 27.778 = ~ 75
3	2,278	2,778 ÷ 27.778 = ~ 100
4	2,083	2,083 ÷ 27.778 = ~ 75
5	2,083	2,083 ÷ 27.778 = ~ 75
6	2,778	2,778 ÷ 27.778 = ~ 100
7	2,951	2,951 ÷ 27.778 = ~ 106.25
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0

Table 13.10
Family Plan Explosion Calculations for Subfamily B

Week	End Item Production Due (CS)	Gross Production Subfamily A (TN)
1	18,750	18,750 ÷ 27.778 = ~ 675
2	6,250	6,250 ÷ 27.778 = ~ 225
3	8,333	8,333 ÷ 27.778 = ~ 300
4	6,250	6,250 ÷ 27.778 = ~ 225
5	6,250	6,250 ÷ 27.778 = ~ 225
6	8,333	8,333 ÷ 27.778 = ~ 300
7	8,854	8,854 ÷ 27.778 = ~ 318.74

Week	End Item Production Due (CS)	Gross Production Subfamily A (TN)
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0

The rollup also recalculates the actual end-item forecast percentages and stores these in the family hierarchy record.

Table 13.11
Total Family Gross Production

Week	Total Family Gross Production	Actual Percentage of Forecast from A	Actual Percentage of Forecast from B
1	234 + 675 = 909	234 ÷ 909 = 25.74%	675 ÷ 909 = 74.25%
2	75 + 225 = 300	75 ÷ 300 = 25%	225 ÷ 300 = 75%
3	100 + 300 = 400	100 ÷ 400 = 25%	300 ÷ 400 = 75%
4	75 + 225 = 300	75 ÷ 300 = 25%	225 ÷ 300 = 75%
5	75 + 225 = 300	75 ÷ 300 = 25%	225 ÷ 300 = 75%
6	100 + 300 = 400	100 ÷ 400 = 25%	300 ÷ 400 = 75%
7	106.25 + 318.74 = ~ 425	106.25 ÷ 425 = 25%	318.74 ÷ 425 = 75%
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0

In Global Production Maintenance (33.7.3), you would also see that the rollup correspondingly updated the family item's gross production, projected weeks of coverage, and projected quantity on hand.

Operations Plan Example

This example illustrates operations plan calculations for supply sites and production lines. Calculations are shown by planning week.

Source Matrix Explosion

For each week with sales forecasts, Source Matrix Explosion (33.13.8) calculates global forecasts by totaling end-item forecasts from marketing sites.

Table 13.12
Site and Global Forecasts

Week	Site A Forecasts	Site B Forecasts	Global Forecasts
1	0	0	0
2	0	0	0
3	0	0	0
4	4,000	6,000	10,000
5	7,000	5,000	12,000
6	4,500	6,500	11,000
7	4,500	4,500	9,000
8	5,000	5,000	10,000
9	6,000	5,000	11,000
10	6,000	6,000	12,000
11	8,000	5,000	13,000
12	0	0	0

The explosion uses the item's average weeks-of-coverage factor (2.0) to calculate the global target inventory levels. Therefore, each week's global target inventory equals the sum of the next two weeks of sales forecasts.

Table 13.13
Global Forecasts and Target Inventory

Week	Global Forecasts	Global Target Inventory
1	0	0
2	0	10,000 = 0 + 10,000
3	0	22,000 = 10,000 + 12,000
4	10,000	23,000 = 12,000 + 11,000
5	12,000	20,000 = 11,000 + 9,000

Week	Global Forecasts	Global Target Inventory
6	11,000	19,000 = 9,000 + 10,000
7	9,000	21,000 = 10,000 + 11,000
8	10,000	23,000 = 11,000 + 12,000
9	11,000	25,000 = 12,000 + 13,000
10	12,000	13,000 = 13,000 + 0
11	13,000	0
12	0	0

The explosion calculates global production due as (Sales Forecast + Target Inventory) – Previous Projected Quantity on Hand. For week 1, the previous projected QOH is 3,000, the ending inventory balance from the previous week.

Table 13.14
Production Due Calculations

Week	Sales Forecast	Target Inventory	Projected QOH	Production Due
1	0	0	3,000	0
2	0	10,000	10,000	7,000 = (0 + 10,000) – 3,000
3	0	22,000	22,000	12,000 = (0 + 22,000) – 10,000
4	10,000	23,000	23,000	11,000 = (10,000 + 23,000) – 22,000
5	12,000	20,000	20,000	9,000 = (12,000 + 20,000) – 23,000
6	11,000	19,000	19,000	10,000 = (11,000 + 19,000) – 20,000
7	9,000	21,000	21,000	11,000 = (9,000 + 21,000) – 19,000
8	10,000	23,000	23,000	12,000 = (10,000 + 23,000) – 21,000
9	11,000	25,000	25,000	13,000 = (11,000 + 25,000) – 23,000
10	12,000	13,000	13,000	0
11	13,000	0	0	0
12	0	0	0	0

The explosion initially calculates projected quantity on hand to equal the target inventory level. However, if you change production due, the system recalculates it as:

(Previous Week's Projected QOH + Production Due) – Sales Forecast

The explosion initially calculates projected weeks of coverage as the item's average weeks-of-coverage factor. But the system recalculates it when you change production due.

For each week, the system subtracts the forecast for each upcoming week, until it encounters a week for which the on-hand quantity is insufficient to cover the forecast. It then divides the remaining inventory by the sales forecast for the week. Finally, it calculates weeks of coverage by totaling the number of complete weeks and the decimal for the partial week.

In Table 13.15, the projected weeks of coverage for week 1 is 2.3, because 3,000 is a sufficient quantity to cover the forecasts for the next 2.3 weeks.

For 10, projected weeks of coverage is only 1.0. The projected on-hand quantity is exactly enough to cover the sales forecast for 11, and there are no sales forecasts in the remaining weeks.

Table 13.15
Sales Forecasts and Projected Quantities on Hand

Week	Sales Forecasts	Projected QOH	Projected Weeks of Coverage
1	0	3,000	2.3
2	0	10,000	2.0
3	0	22,000	2.0
4	10,000	23,000	2.0
5	12,000	20,000	2.0
6	11,000	19,000	2.0
7	9,000	21,000	2.0
8	10,000	23,000	2.0
9	11,000	25,000	2.0
10	12,000	13,000	1.0
11	13,000	0	0.0
12	0	0	0.0

In this example, all production is distributed to one supply site with two production lines, 001 and 002. The site produces 75% of its requirement for the item on line 001 and the remaining 25% on line 002.

Table 13.16
Site and Line Production Due

Week	Total Site Production Due	Line 001 Production Due (75%)	Line 002 Production Due (25%)
1	0	0	0
2	7,000	5,250	1,750
3	12,000	9,000	3,000
4	11,000	8,250	2,750
5	9,000	6,750	2,250
6	10,000	7,500	2,500
7	11,000	8,250	2,750
8	12,000	9,000	3,000
9	13,000	9,750	3,250
10	0	0	0
11	0	0	0
12	0	0	0

The formula for projected line production hours is Line Production Due Quantity ÷ Hourly Line Production Rate. For line 001, the production rate is 375 units per hour. For line 002, it is 125 units per hour.

Table 13.17
Line 001 Projected Production Hours

Week	Line 001 Projected Production Hours
1	0
2	14 = 5,250 ÷ 375
3	24 = 9,000 ÷ 375
4	22 = 8,250 ÷ 375
5	18 = 6,750 ÷ 375
6	20 = 7,500 ÷ 375
7	22 = 8,250 ÷ 375
8	24 = 9,000 ÷ 375
9	26 = 9,750 ÷ 375
10	0
11	0
12	0

Table 13.18
Line 002 Projected Production Hours

Week	Line 002 Projected Production Hours
1	0
2	14 = 1,750 ÷ 125
3	24 = 3,000 ÷ 125
4	22 = 2,750 ÷ 125
5	18 = 2,250 ÷ 125
6	20 = 2,500 ÷ 125
7	22 = 2,750 ÷ 125
8	24 = 3,000 ÷ 125
9	26 = 3,250 ÷ 125
10	0
11	0
12	0

The line utilization percentage is the line's production load divided by its capacity. The weekly capacity is 15,000 cases for line 001 (375 * 40 hours) and 5,000 cases (125 * 40 hours) for line 002. In this example, both lines have a standard 40-hour weekly shift calendar, and there are no scheduled holiday, downtime, or overtime periods.

Table 13.19
Line 001 Utilization Percentages

Week	Line 001 Utilization Percentages
1	0%
2	35% = 5,250 ÷ 15,000
3	60% = 9,000 ÷ 15,000
4	55% = 8,250 ÷ 15,000
5	45% = 6,750 ÷ 15,000
6	50% = 7,500 ÷ 15,000
7	55% = 8,250 ÷ 15,000
8	60% = 9,000 ÷ 15,000
9	65% = 9,750 ÷ 15,000
10	0%
11	0%
12	0%

Table 13.20 Line 002 Utilization Percentages

Week	Line 002 Utilization Percentages
1	0%
2	35% = 1,750 ÷ 5,000
3	60% = 3,000 ÷ 5,000
4	55% = 2,750 ÷ 5,000
5	45% = 2,250 ÷ 5,000
6	50% = 2,500 ÷ 5,000
7	55% = 2,750 ÷ 5,000
8	60% = 3,000 ÷ 5,000
9	65% = 3,250 ÷ 5,000
10	0%
11	0%
12	0%

SECTION 2

DRP and Other Planning Modules

This section describes the following modules:

Chapter 14

Distribution Requirements Planning

Distribution Requirements Planning (DRP) is a planning function designed for companies with multiple sites having interdependencies of supply and demand. This chapter explains how to use the DRP module to create and maintain a distribution requirements plan.

Introduction

Distribution requirements planning (DRP) balances supply and demand in a time-phased manner for items transferred between sites. Typically, these sites exist in several databases connected over a network.

The transfer of demand from the site receiving the items (receiving or demand site) to the site supplying the items (shipping or supply site) is facilitated through the generation of intersite requests. DRP calculates distribution item requirements, generates intersite requests, and manages shipment schedules and transportation.

At the shipping site, intersite requests are grouped and associated with a single distribution order (DO), which manages shipments to the demand site. The DO shipment transfers inventory into a goods-in-transit (GIT) location. When the demand site receives the goods, they are transferred from GIT into a true location at the demand site.

While intersite requests are typically created at the receiving site, it is possible to create an intersite request as part of maintaining a distribution order at the shipping site.

See "Purchase Orders and Sales Orders" on page 148 for a discussion of these conditions.

Note Under some conditions, using sales and purchase orders may be a better option than DRP.

DRP Functions

The functions used as part of DRP processing are grouped on five menus. Most DRP setup and processing occurs at the receiving site. The menus support a separation of functions between receiving and shipping sites.

Use functions on the following menus at the receiving site:

- Source Network Menu (12.1). Use these functions to set up codes that determine the sites that supply an item when demand exists at the receiving site.
- Transportation Management Menu (12.5). Use these functions to set up information about the methods your company uses to ship items from one site to another. This information is used by DRP at the receiving site when it creates intersite requests.

- Distribution Requirements Planning Menu (12.13). Use these functions to calculate gross requirements, generate intersite requests and action messages, review action messages, and optionally approve intersite requests.
- Intersite Requests Menu (12.15). Use these functions to modify intersite requests, transfer demand generated when remote databases are not connected, receive items shipped on distribution orders, and archive and delete closed intersite requests at the receiving site.

Use functions on the following menu at the shipping site:

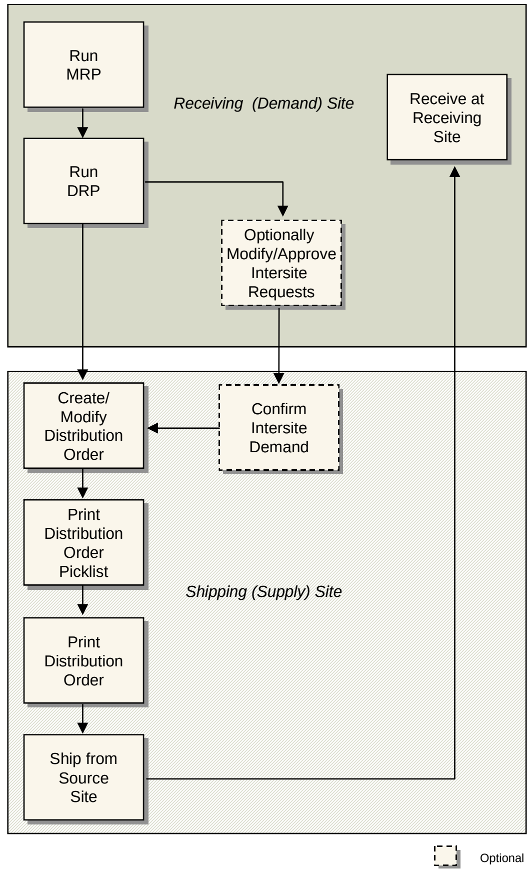
- Distribution Orders Menu (12.17). Use these functions to optionally modify and confirm intersite requests, group requests into distribution orders, print orders, pick items, ship orders, and archive/delete closed intersite requests at the shipping site. When sites are in different databases, use functions on this menu to import demand created when the databases were disconnected and validate current demand records.

DRP Life Cycle

Figure 14.1 illustrates the process DRP uses to generate intersite requests at the receiving site, which are then referenced on distribution orders and filled at the shipping site.

See “Managing Intersite Requests” on page 162.

Fig. 14.1
Distribution Order Life Cycle



1. Initial demand for DRP-planned items at the receiving (demand) site is calculated by MRP or generated by sales orders and forecasts.
2. When DRP is run, it generates planned intersite requests at the demand site. Review DRP action messages with DRP Action Message Review/Update (12.13.5).
3. Planners modify and approve intersite requests at the demand site. Because DRP- and MRP-generated requests are approved by default, this step is optional. Using Planned Intersite Request Approval (12.13.10) to manually approve intersite requests changes their status from Planned to Firm Planned. The system does not alter these requests when MRP or DRP is run again.

4 Intersite requests generated by DRP create item demand at source (supply) sites through relationships set up with network codes. When a required item's network code divides demand among multiple sites using a supply percent, the system generates item demand at each supply site in the network.

See "Source Networks" on page 150.

5 Item demand at the supply site is considered as gross requirements for requested items when MRP is run at that site. Typically, the supply site uses master scheduling functions to manage these requirements.

6 Optionally, review and manually confirm item demand at the supply site using Intersite Demand Confirmation (12.17.1).

Tip
If needed, you can also create a new intersite request in this program.

At this time, you can adjust some intersite request details, such as the item due date, transportation code, inventory quantities, and financial data. Changes to intersite requests at source sites are reflected on corresponding intersite requests at the demand site. Similarly, changes to intersite requests at the demand site are visible at supply sites.

Requests that have been modified or confirmed at the supply site have a status of Exploded and are not replanned when DRP is next run.

7 At the supply site, create distribution orders and reference one or more intersite requests. This process is similar to the way purchase requisitions are combined into purchase orders. Use Distribution Order Maintenance (12.17.14), Distribution Order Workbench (12.17.13), or Distribution Order Processing (12.17.21). You can also create intersite requests dynamically in Distribution Order Maintenance or Distribution Order Processing.

Note Distribution Order Processing lets you create an order, allocate and pick items, and ship the order from one function.

See page 180.

8 At the supply site, print orders with Distribution Order Print (12.17.18). Pick items by generating a picklist with Distribution Order Picklist Print (12.17.19).

Tip
You can also pick items during DO maintenance.

9 Ship orders with Distribution Order Shipments (12.17.22). You can create shippers for a DO when a valid shipping group is associated with the ship-from and ship-to sites.

10 At the receiving site, use Distributed Order Receipt (12.15.20) to record the receipt of distribution order shipments.

11 Use DO Shipment Reconciliation (12.17.17) to display shipments with a receipt amount that differs from the shipment amount.

Purchase Orders and Sales Orders

You can use purchase orders and sales orders instead of intersite requests and distribution orders. At the receiving site, enter purchase orders or supplier schedules instead of intersite requests. At the supply site, enter sales orders or customer schedules instead of distribution orders. DRP still creates intersite requests, but deletes them when it sees purchase orders satisfying the projected requirements.

You should use purchase and sales orders instead of intersite requests and distribution orders if:

- Base currencies differ between sites.
- Taxes need to be calculated and recognized in the general ledger.
- Documentation must be produced for customs.

To use intersite purchase and sales orders, set up procedural controls to ensure that sales orders at source sites mirror purchase orders at receipt sites. Also, enter the inventory site codes for the customer and supplier address codes.

There are two drawbacks to using purchase and sales orders instead of intersite requests and distribution orders:

- There are no in-transit inventory records.
- There is little or no data for transportation planning, which normally uses load information from intersite requests.

Setting Up DRP

To use DRP, you must first establish some basic data used in the planning process. Figure 14.2 summarizes the setup steps.

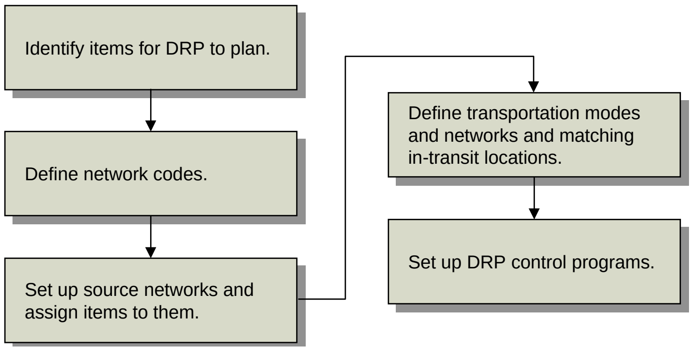


Fig. 14.2
DRP Data Setup Work Flow

Purchase/Manufacture Code

DRP only plans items designated as distribution items. Usually, one site supplies these items to another site. To designate a distribution item, set its Purchase/Manufacture code to D in Item Master Maintenance (1.4.1), Item Planning Maintenance (1.4.7), or Item-Site Planning Maintenance (1.4.17). Item-Site Planning Maintenance lets you define an item as a distribution item at one site and a non-distribution item—that is, a manufactured or purchased item—at another.

See *User Guide Volume 6: Master Data* for details on defining items.

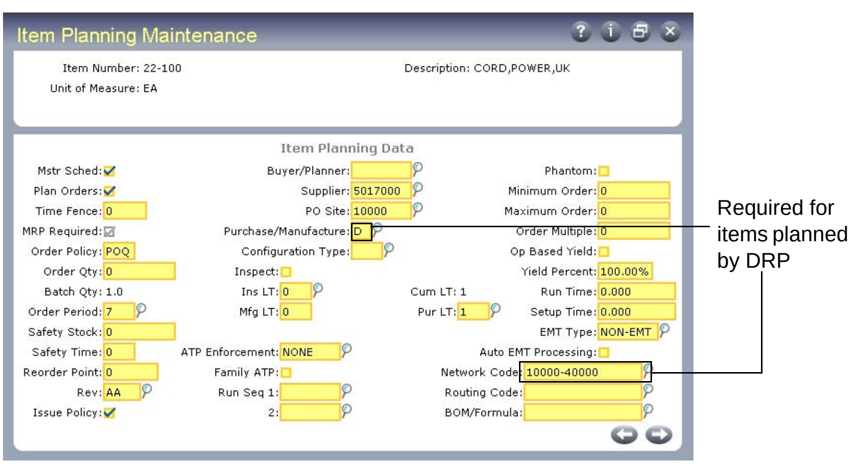


Fig. 14.3
Item Planning Maintenance (1.4.7)

Source Networks

DRP uses source networks in the same way MRP uses product structures. MRP explodes product structures for manufactured items and creates planned orders. Similarly, DRP explodes source networks for distribution items and generates intersite requests.

Supply network relationships can represent a simple, single-tiered distribution environment. At the other extreme, the network can represent a complex, multi-tiered environment. This is typical when one or more plants supply product to each other and to regional distribution centers, which, in turn, supply branch warehouses.

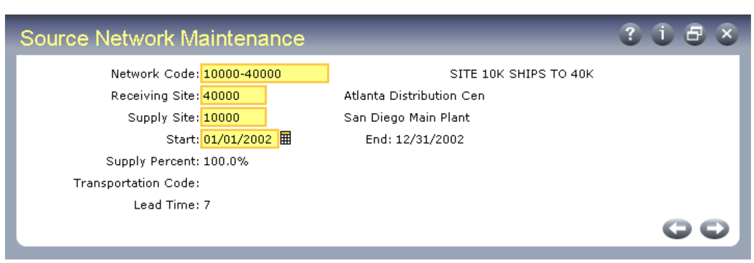
A network code defines one or more supply relationships. Each relationship in the network contains a receiving (demand) site, a supply site, and a supply percentage. A relationship is a one-way, site-to-site relationship. Set up one for every demand-to-supply site link. You can group multiple site-to-site relationships under the same source network.

Example If material travels from site A to T and from T to A, two relationships are required.

You must assign each distribution item to a single source network. Do this in Item Master Maintenance (1.4.1), Item Planning Maintenance (1.4.7), or Item-Site Planning Maintenance (1.4.17). DRP plans intersite requests the same way for all items assigned to the same source network. Requests for those items are sent to the same supply sites, calculated using the same supply percentage, and request the same transportation mode or specify the same lead time.

Use Network Code Maintenance (12.1.1) to define network codes. Optionally, you can assign the codes to a planner. Then, use Source Network Maintenance (12.1.13) to specify relationships in the network.

Fig. 14.4
Source Network Maintenance (12.1.13)



Optionally specify a transportation code or lead time. If you have two methods of transportation between the same sites, you must set up separate network codes for each.

A demand site can receive supply requirements for one item from multiple supply sites. Specify this in Supply Percent.

Transportation Management

Use the functions on the Transportation Management Menu to define codes and schedules used by DRP when it creates intersite requests.

Transportation Modes

The methods a company uses to transport items from source to receiving sites—trucks, ships, containers, and so on—are transportation modes. Define transportation modes in Transportation Mode Maintenance (12.5.1). DRP uses the transportation mode’s effectivity dates, load lead time, transit lead time, unload lead time, ship days, and receive days to schedule intersite requests.

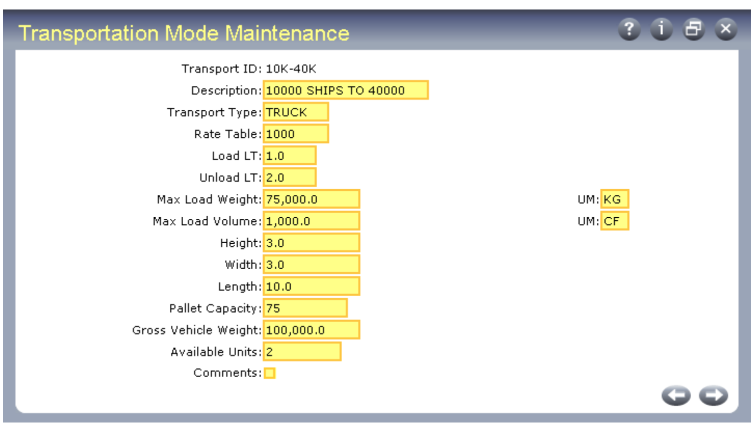


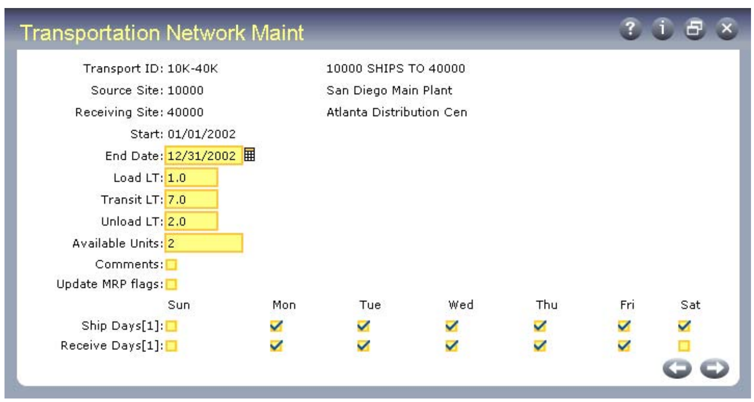
Fig. 14.5 Transportation Mode Maintenance (12.5.1)

Transportation modes can designate available units—for example, how many trucks or rail cars are available—and the capacity for each unit. You must designate a different transportation mode for each type of transportation unit you want DRP to plan. For example, a company-owned fleet of trucks would use a different transportation mode for each type or size of truck.

Transportation Networks

A transportation network identifies which method or methods are used to move products between a shipping and receiving site. Define transportation networks in Transportation Network Maintenance (12.5.5) by entering a transportation mode, also called a transportation code or ID, a shipping site, a receiving site, and effectivity dates. Lead times and available units default from the transport ID. Specify the days when shipping and receiving can be scheduled.

Fig. 14.6
Transportation Network Maintenance (12.5.5)



When generating and scheduling intersite requests, DRP calculates transportation lead time by adding the load lead time, transit lead time, and unload lead time. The lead times for the transportation network override the source network lead time. Departure and receipt dates are scheduled only on days permitted by the transportation network, unless there is a holiday or fixed shipping schedule to override it.

In determining transportation load profiles, DRP calculates the projected load at departure using intersite requests for traffic between two sites, transportation modes, and item data for weight and volume. Projected capacity is calculated using transportation modes and transportation networks between the same two sites.

Shipping Schedules

Use Shipping Schedule Maintenance (12.5.9) to set up a detailed shipping schedule for a specific combination of transportation mode, shipping site, and receiving site.

The system uses ship dates set up in Shipping Schedule Maintenance, in coordination with receiving days and load, transit, and unload lead times defined in Transportation Network Maintenance, to calculate default ship dates for intersite requests. When a shipping schedule is not defined, the ship days from the transportation network are used instead.

Ship dates in Shipping Schedule Maintenance initially default from the ship days set up in Transportation Network Maintenance for the specified transportation mode and site combination. You should modify the detailed shipping schedule to consider any exceptions to these defaults.

Freight Rate Tables

Optionally, use Freight Rate Table Maintenance (12.5.13) to set up freight rate tables. These are for reference purposes only. They cannot be used to calculate freight charges. You can assign a default rate table to a transportation mode in Transportation Mode Maintenance.

Note You can accrue freight charges only if you are using the optional Logistics Accounting module.

See *User Guide Volume 6: Master Data*.

In-Transit Locations

When items on a distribution order are shipped, internally they are transferred to an in-transit inventory site. The in-transit site defaults to the receiving site. This assumes that title is transferred to the receiving site at shipment (FOB destination). The site can be changed to the shipping site (or another site) in various order maintenance programs.

The in-transit location corresponds to the transportation code. If the in-transit site does not support automatic locations, you must create these locations in Location Maintenance (1.1.18) before shipping and receiving DRP items.

Note Assign in-transit locations an inventory status code with Nettable set to No. Otherwise, MRP will consider supply in that location twice: once for the scheduled receipt and again for the nettable quantity in the location.

Master Scheduling Distribution Items

See *User Guide Volume 3: Manufacturing*.

Items distributed to other sites in the supply chain must be master scheduled differently from other items since they are subject to intersite requests.

See “DRP Action Messages” on page 183.

Unless you use purchase and sales orders to handle intersite supply and demand, do not enter forecasts for intersite demand, because intersite requests do not consume forecast. For example, a forecast for 100 units and an intersite request for 100 units would add up to a total demand of 200 units.

Tip
Maintaining the forecast this way can be time-consuming.

- When creating shipment forecasts in the Forecast/Master Plan module, enter monthly forecast values as the sum of the gross sales forecast and the net intersite forecast.

  Example A site forecast indicates that 1000 units will be sold directly to customers and an additional 400 units will be shipped to other sites. Intersite requests have been received for 150 units in that period. The gross sales forecast is 1000 units while the net intersite forecast is 250 units. For that period, enter a forecast of 1250.

- Enter master scheduled orders for distribution items. Be aware that DRP may consider these as excess supply and generate action messages recommending that you de-expedite or cancel them.

Set Up Control Programs

Two control programs affect processing in DRP:

- Use DRP Control (12.13.24) to determine if MRP can also plan DRP items. These two functions can be run sequentially. However, when you have DRP items at multiple levels of your product structure, you may want to run them together.

  You can also use DRP Control to specify settings related to the use of a Progress AppServer to distribute MRP/DRP tasks among multiple processors.
- Use Distribution Management Control (12.15.24) to determine how numbering of intersite requests and distribution orders is managed and to set up default values for the Comment field on these documents.

See "DRP and MRP" on page 157 for details.

See "MRP/DRP Calculations Using AppServer" on page 159.

Executing DRP

DRP is typically run regularly, often daily. Run DRP only when no activity is underway that could affect source networks, product structures, inventory, demand, or supply. Run DRP-related reports and inquiries immediately after DRP.

DRP Modes

You can run DRP in three operational modes:

- Net Change
- Regenerative
- Selective

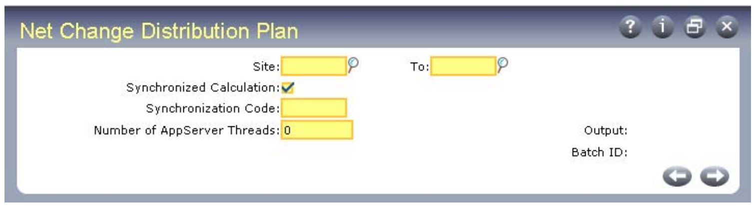
You can run DRP for more than one site at a time. Since this may take some time to process, consider using batch mode.

Net Change Distribution Plan

Tip
Set Update MRP Flags in Transportation Network Maintenance to Yes only when you make changes that impact DRP calculations.

Net Change Distribution Plan (12.13.1) recalculates demand only for items with MRP Required set to Yes in the item planning data. If Update MRP Flags in Transportation Network Maintenance (12.5.5) is Yes, the system sets the MRP Required field for DRP items at that receiving site to Yes. DRP then plans for that receiving site the next time it is run in net change mode. The system also sets an item's MRP Required field to Yes when demand data or item planning parameters change for that item.

Fig. 14.7
Net Change Distribution Plan (12.13.1)



Regenerative Distribution Plan

Regenerative Distribution Plan (12.13.2) and Net Change Distribution Plan produce the same results. However, net change often runs more quickly. It looks only at distribution items that have had a change in inventory information, design, forecast, cost, and so on since DRP was last run. Regenerative DRP plans for all items in the site database.

Selective Distribution Plan

Selective Distribution Plan (12.13.3) lets you select the items you want to plan. It is useful for simulations, but use it carefully. It does not always yield the same results as net change or regenerative DRP because it does not implode higher-level requirements.

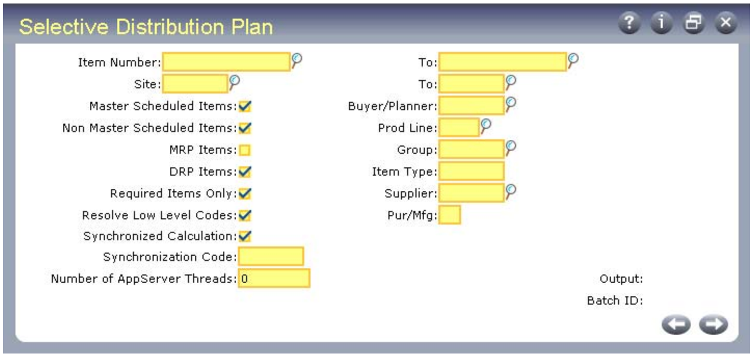


Fig. 14.8 Selective Distribution Plan (12.13.3)

Run Selective Distribution Plan in net change mode by setting Required Items Only to Yes. Run it in regenerative mode by setting Required Items Only to No. Plan for small groups of items by specifying combinations of buyer/planner, product line, group, item type, supplier, and Purchase/ Manufacture code.

DRP and MRP

See *User Guide Volume 3: Manufacturing*.

To manage the supply, demand, and resources of a supply chain, DRP must be integrated with MRP. The two systems are complementary. MRP balances supply and demand within a site, while DRP balances supply and demand between sites.

MRP considers intersite requests as demand at the supply site. Therefore, when to run DRP in relation to MRP depends on where distribution items appear in the product structures for that site.

- For sites that distribute finished products, you usually run DRP before MRP to generate demand for those products at other sites.
- For sites that supply component items to other sites, run MRP first.

If you have DRP items at multiple levels of product structures for a site, you can also run MRP and DRP in combination. MRP and DRP take advantage of the intersite low-level codes. MRP/DRP Combined, a field in both MRP Control (23.24) and in DRP Control (12.13.24), allows MRP to pass gross requirements to DRP items. DRP creates the intersite request, creating demand at the supply site. The item at the supply site is then planned by MRP.

Running MRP and DRP in combination is especially useful if you use centralized purchasing—common materials are purchased by multiple sites from common suppliers. Lowest-level items (the items highest in your bills) are processed first, regardless of site, and all purchase orders are planned after all site and intersite demand has been calculated.

If you choose to run MRP and DRP separately, MRP creates gross requirements for DRP items, but then does not use DRP to plan the intersite request. MRP simply completes the site or sites where it is run.

A later DRP run explodes the gross requirements for distribution items and creates the intersite requests. These should now be exploded at the supply site using MRP. The only advantage of running the two programs separately is that the processing times are separated into two periods—a possible requirement if there are hardware limitations.

DRP Calculation and Processing

See *User Guide Volume 3: Manufacturing*.

Like MRP, DRP reviews all sources of demand and supply at a given site and plans items in sequence by low-level code. A distribution item's low-level code is based on the product structure attached to the item at the supply site. DRP and MRP calculations use the same algorithms. Calculations are the same when time-phasing supply and demand, netting requirements, planning supply, and reporting exception conditions.

Since source networks are to DRP what product structures are to MRP, the explosion logic is the same. DRP explodes source networks for distribution items, identifying the sites that supply this item and the percentage of the requirement to be satisfied by each, and generates intersite requests rather than planned orders.

See "DRP Action Messages" on page 183.

To project inventory balances and calculate net requirements, DRP tentatively reschedules intersite requests and plans all activity based on this schedule. It also generates action messages recommending actions a planner should take to execute the plan.

DRP creates intersite requests if there is a requirement at a site that meets the following criteria:

- The required item has a non-blank Order Policy and Plan Orders is Yes in Item Master Maintenance (1.4.1).
- The item's Purchase/Manufacture code is D.
- A source network exists.
- The system has access to the source sites.

When DRP creates intersite requests, it schedules the shipment date at the shipping site and the due date at the receiving site. DRP calculates these dates using the lead times defined for the transportation network. If none are defined, the system retrieves the lead times defined for either the transportation code or the source network assigned to it.

Pegging

DRP source-to-requirement pegging lets you associate sources of demand or supply at one site with plans at another. Since sources of demand are exploded based on source networks rather than product structures, pegging is done across sites. Use DRP Detail Inquiry (12.13.16) or DRP Detail Report (12.13.17) to review sources of intersite supply and demand for an item.

- Sources of demand display with the due date, quantity, intersite request number, and receiving site.
- Sources of supply display with the due date, quantity, intersite request number, and shipping site.

MRP/DRP Calculations Using AppServer

If you use Symmetric Multiple Processor (SMP) computers and also have the Progress Application Server (AppServer) installed, you can use the AppServer to distribute the processing load across your available computing resources and complete the calculations in considerably less time.

Note You can also use SMP computers to run synchronized MRP/DRP calculations, although the AppServer method gives better results.

Setting Up Your System to Use an AppServer

To set up your system to run MRP/DRP with the AppServer, follow these steps:

See *User Guide Volume 9: Manager Functions* for more information on setting up an AppServer and configuring it to run MRP/DRP.

1. Configure the AppServer using Progress Explorer or by editing the Progress `ubroker.properties` file.
2. Use AppServer Service Maintenance (36.19.1) to define the parameters used to connect to the AppServer.
3. In MRP Control (23.24) or DRP Control (12.13.24), set the following fields to the specified values:
   - Set Use AppServer to Yes.
   - Set AppServer Name to the name you specified in AppServer Service Maintenance.
   - Set Default Number of Threads to twice the number of processors available on your machine. For example, if your machine consists of 2 processors, enter 4. This will create four AppServer threads for an MRP/DRP run. This value defaults to the MRP/DRP execution programs. You can change it when you run the program.

   Note The ideal number of threads varies from environment to environment based on the processing load on the machine. For example, when the processing load is heavy, you might set the default to one thread for each processor.

Using the AppServer with MRP/DRP

To run MRP/DRP with the AppServer, use any of the DRP or MRP programs. Set Synchronized Calculation to No. Number of AppServer Threads defaults from MRP Control or DRP Control, as appropriate. You can leave this value or change it as needed based on the current system load.

When the planning session starts, the system distributes the load among the AppServers for the items that require planning. When a thread completes planning for a given level, the program then reuses the existing thread for the next level. This process continues until all items are planned.

The audit report identifies all of the items planned for all of the MRP/DRP planning sessions that were run with the AppServer.

Synchronized MRP/DRP Calculations

On SMP computers, you can use the Synchronized Calculation and Synchronization Code fields to run multiple MRP/DRP sessions at the same time. On these machines, you can run one session on each available machine for a given synchronization code against a single database.

Tip
Without SMP computers, these fields have no impact on DRP or MRP processing.

To run synchronized MRP/DRP, use any of the materials or distribution requirements planning programs. Open multiple views of the program. In each view, specify selection criteria for site, item, and so on. Set Synchronized Calculation to Yes and enter the same Synchronization Code for all views. Then start the program in each view.

Note If you use a Progress Application Server to run MRP/DRP, you should set Synchronized Calculation to No.

See “MRP/DRP Calculations Using AppServer” on page 159.

During synchronized runs, the system creates a master work table listing all records that require planning and then updates the low-level codes. Then each session selects the first available record from the work table, planning the lowest-level items first. When an item is planned, its MRP Required field is set to No, so it is not replanned by another session. When a session completes planning at the lowest level, it waits until the other sessions are complete at that level. Then all sessions plan the next level up. This continues until all items are planned.

For more efficient processing, start the sessions with identical selection criteria—for example, the same site range—then all sessions select the next available record for planning. This results in the most efficient processing. When any planning level is finished, a session only waits for the other sessions to complete that level before all sessions can start on the next level.

If you start one session for each site, or for distinct site ranges, then when a session completes a level, it must wait for all other sessions to complete planning at that level. For sites with many items at a given level, that creates many more orders, requiring more time to process. Even if one SMP machine is being used by another unrelated process, you could end up with temporarily idle sessions. The advantage of running sessions by distinct ranges is that the audit reports print the planned items in the ranges you entered in each session.

Synchronization codes distinguish a synchronized calculation. All sessions started with the same synchronization code access the same work table of items for replanning. If a session is started with a different synchronization code, it will run without waiting for other sessions running at the same time. This can cause locking problems and double processing. A blank synchronization code is valid.

In some situations, running one session in non-synchronized mode may increase processing efficiency.

Example You have a DRP receiving site that generates demand to two other sites but receives no demand itself. You run the session for the DRP receiving site in non-synchronized mode. That site is planned without waiting for the supply sites, and the two DRP supply sites wait only for the first site to generate the appropriate DRP demand. Once this is created, the two supply site sessions start their runs without waiting for the entire first calculation to complete.

Once again, it would be more efficient to run as three synchronized calculations for the same site range. However, using separate site ranges would make the audit reports simpler to read.

Managing Intersite Requests

Like MRP, DRP generates planned orders and action messages. Since DRP planned orders represent demands on other sites, they are called *intersite requests*.

At the supply site, you can reference one or more intersite requests on a distribution order. Typically intersite requests are generated at the receiving site. However, they can also be created dynamically as part of Distribution Order Maintenance (12.17.14) or in Distribution Order Processing (12.17.21).

The need to add a line to a distribution order without a supporting intersite request can occur for a number of reasons, such as the following:

- Urgent demand rises between DRP cycles.
- A few additional items are needed to fill space in a truck or container.
- The supply site wants to ship non-sales items such as samples.
- There is insufficient storage space at the supply site for items that could be stored at the demand site.

Intersite requests are to DRP what planned orders are to MRP. To the receiving site, they are like purchase requisitions or supply records. At the shipping site, they are like sales orders or demand records—external sources of demand that can be master scheduled.

MRP creates the initial demand for DRP-planned items at the receiving site. Running DRP at the receiving site generates intersite demand at the shipping site at the same time it generates intersite requests for the receiving site.

Intersite requests are visible at both sites. A change to an intersite request at the receiving or shipping site is automatically reflected in the corresponding request at the other site. However, the programs used to update intersite requests at the shipping and receiving sites are updating distinct tables in the database:

- The Distributed Site Requisition Detail (dsd_det) is the detail data for the request at the receiving site.
- The Distributed Site Order Detail (ds_det) is detail data for the request at the shipping site.

To transfer intersite requests automatically, the shipping and receiving sites must be connected over the computer network. If they are not, you can transfer intersite requests to the shipping sites in batch after running DRP at the receiving sites.

Optionally, you can then confirm intersite demand at the shipping site. The shipping site translates this demand into distribution orders, which are picked and shipped to the receiving site. If necessary, additional intersite requests can be generated at the shipping site and associated with the order. These orders are received at the receiving site in the same manner as purchase orders.

Intersite Requests at the Demand Site

Create intersite requests at a receiving site manually with Intersite Request Maintenance (12.15.1) or by running DRP. You can also use Intersite Request Maintenance to modify request status, due date, and receiving location at the receiving site. This site determines the quantity ordered and the transportation code for orders from each supply site. You can change the transportation code, but not the quantity ordered, at the supply site.

Fig. 14.9 Intersite Request Maintenance (12.15.1)

Like work orders, intersite requests can have a status of planned, firm planned, exploded, allocated, released, or closed. The statuses have varying affects, as follows:

P (Planned). This status applies to system-generated requests only. Planned requests can be deleted or replanned by the system the next time MRP or DRP is run.

F (Firm Planned). This is the default status for intersite requests created in Intersite Request Maintenance. Firm-planned requests are not rescheduled by MRP or DRP. Instead, the system generates action messages suggesting changes. Manually update requests with this status, as needed.

E (Exploded). The status of an intersite request is changed to Exploded when the supply site confirms the request with Intersite Demand Confirmation. For confirmed requests, DRP uses the confirmed quantity and due date. The original quantity and due date remain for comparison.

A (Allocated). The status of an intersite request is changed to Allocated when the supply site references the intersite request on a distribution order. This is the default status for intersite requests created dynamically as part of creating a distribution order.

Because intersite request status codes are identical to work order status codes, you can manually set request statuses to Batch (B), Released (R), or Closed (C). The B and R status codes have no system-assigned significance for intersite requests, but individual demand sites may use them for special purposes. For example, you might manually assign a status of Released to requests when you receive confirmations from supply sites.

Manually setting the status of an intersite request to C (closed) does not change quantities associated with the request. It does, however, have the following effects:

- Reduces the quantity on order in the inventory master at the receiving site by the quantity open on the request
- Lets you archive/delete the intersite request at the supply site even though the quantity shipped is not the same or greater than the quantity confirmed

Archiving Intersite Requests

Use Intersite Request Delete/Archive (12.15.23) at the receiving site to delete and archive intersite requests created automatically by planning functions or manually using Intersite Request Maintenance. To delete or archive an intersite request, the quantity received on the request must be equal to the quantity confirmed.

When you delete an intersite request, the system does not automatically delete the demand records associated with that request at the shipping site. Generally, you should use Closed Intersite Demand Delete/Archive (12.17.23) to delete demand records at supply sites before using this function to delete corresponding intersite requests at demand sites.

Intersite Requests at the Supply Site

At the supply site, use Intersite Demand Confirmation (12.17.1) to confirm all, or portions of, the quantity, due date, ship date, transportation code, and in-transit site for an intersite request. If any part of a request has been confirmed, DRP plans using the quantities and dates confirmed by the supply site. If an intersite request has not been confirmed, DRP processes it for the quantities and due dates automatically generated by the system.

Intersite demand at the supply site appears as the Gross Reqs value in the Master Schedule Summary and is treated as independent demand. You can adjust the demand quantity during demand confirmation. The remainder of the process at a shipping site involves transportation planning, order aggregation, and shipping.

Managing Database Connections

To execute DRP at the shipping site, active database connections must be available. In the receiving site, it is possible to run DRP and transfer or import demand records later.

Receiving Database

When DRP is executed in the receiving database and determines that the shipping database is unavailable, it saves demand records in an equivalent table in the local database. Transfer these records to the shipping database in two ways:

- When the connection is restored, run Intersite Demand Transfer (12.15.9). This takes the records in the local table and moves them to the equivalent table (ds_det) in the other database.

  If the intersite requests were modified in the shipping database while the connection was down, the transferred requests overwrite the new versions in the shipping database. It is assumed the intersite request records in the receiving database take precedence.

- Run Intersite Demand Export (12.15.10) in the receiving database. This exports the records to an operating system file in a subdirectory of the current directory with the name of the shipping database.

Tip
To avoid an error, set up this subdirectory before exporting the transactions.

After the file is created, use Intersite Demand Import (12.17.10) to import it into the shipping database. The default file name is the same as that for Intersite Demand Export.

Intersite Demand Export and Import are useful when there are many demand records or when network connections are unreliable or nonexistent.

Shipping Database

The export/import programs transfer information in one direction only: from the demand (receiving) to the supply (shipping) database. The supply database must remain connected to the demand database to confirm or enter distribution orders for the demand database.

When a connection is restored, run Intersite Demand Validation (12.17.12) from the supply database. This looks at existing intersite demand in the supply database. If changes occurred while the system was down, the program replaces that demand with records from the demand database. It does not look at new demand—only at existing demand records in the supply database.

This process can be slow because the system needs to determine what action to take with each demand record.

Using Distribution Orders

At a supply site, you can process several intersite requests at one time by combining them in a distribution order, the same way purchase requisitions are combined into purchase orders. Distribution orders simplify picking and shipping materials from one site to another.

At the supply site, distribution orders can follow this life cycle:

1. Create distribution orders in Distribution Order Maintenance (12.17.14) or Distribution Order Workbench (12.17.13). Using the workbench lets you create orders by grouping requests based on various selection criteria.

2. Print orders with Distribution Order Print (12.17.18).

3. Print picklists with Distribution Order Picklist Print (12.17.19).
4. Ship orders with Distribution Order Shipments (12.17.22). Additional shipping features are available when a shipping group exists for the distribution order.

This life cycle can be streamlined in several ways:

- You can allocate and pick items as part of Distribution Order Maintenance, eliminating the need to print a picklist.
- You can use Distribution Order Processing (12.17.21) to create a distribution order, allocate and pick items, and ship the items as part of a single process.

Creating Distribution Orders

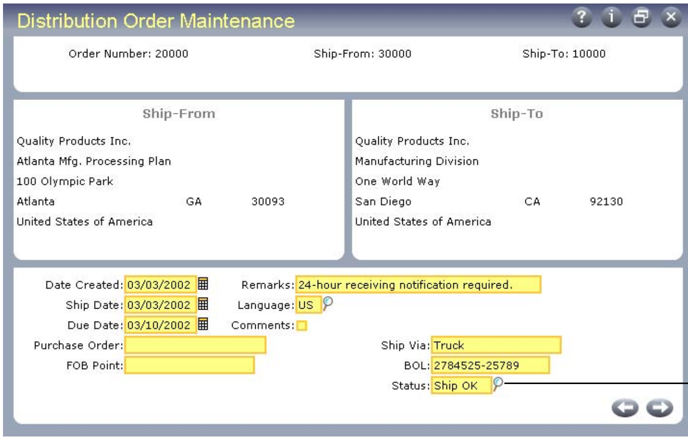
Use Distribution Order Maintenance (12.17.14) to reference one or more intersite requests in preparation for picking and shipping items to another site.

A distribution order is typically a response to demand generated at the receiving site. However, you can also create an intersite request (representing demand) as part of Distribution Order Maintenance.

Note In a multiple-database environment, the shipping site must be actively connected to the receiving site database to enter a distribution order.

Figure 14.10 illustrates the header of Distribution Order Maintenance.

Fig. 14.10 Distribution Order Maintenance (12.17.14)



The DO header includes the supply site, the ship-to site, and other general order information. You can enter a user-defined status for the order in the Order Status field. This field is for reference only and does not affect order processing.

Order status displays on selected reports including Distribution Order Print (12.17.18), Distribution Order Picklist Print (12.17.19), and DO Shipment Reconciliation (12.17.17).

Any comments you add at the time you create the distribution order print on Distribution Order Report (12.17.16), Distribution Order Print (12.17.18), and Distribution Order Picklist Print (12.17.19).

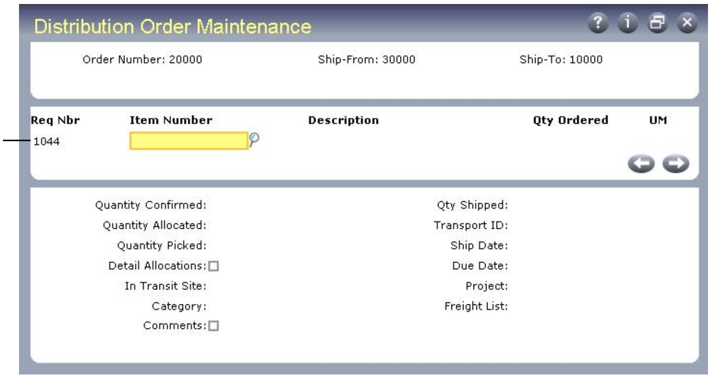
Note If you are using the Logistics Accounting module, a frame for input of freight data displays. Based on the freight terms you specify, another frame may display for input of the code identifying the associated logistics supplier.

See *User Guide Volume 6: Master Data* for details on Logistics Accounting.

Referencing Intersite Requests

Figure 14.11 illustrates the frames in Distribution Order Maintenance for referencing intersite requests.

Fig. 14.11
Distribution Order Maintenance, Line Item Frame



Specify an existing request number or create a new intersite request by leaving the Request Number field blank during line-item entry. When you attach an existing request, the item number, description, quantity ordered, and UM default from the intersite request and cannot be changed.

When you create a new intersite request, you can update fields that cannot be updated when you reference an existing request. A pop-up window prompts for order date, status, an optional sales/job number, and the receipt location. The status of intersite requests created dynamically defaults to A (allocated) and cannot be changed.

The quantity ordered for an intersite request created as part of DO maintenance defaults to 0 (zero), but can be updated if needed. The quantity ordered defaults to the Quantity Confirmed field.

Note A request created in Distribution Order Maintenance is identical to a request created by DRP or created manually in Intersite Request Maintenance (12.15.1) or Intersite Demand Confirmation (12.17.1).

Figure 14.12 illustrates the pop-up for specifying details for a new intersite request.

Fig. 14.12
Distribution Order Maintenance, Intersite Request Pop-Up

Order Date. Enter the date this intersite request was created. The default is the system date.

You can select information to display on various reports for ranges of order dates.

Status. Status is automatically set to A (allocated) and cannot be changed.

See page 164 for more details.

Sales/Job. Enter an optional code associating the order with a specific sales or job number.

Tip
For a new order, the default is blank.

Receipt Location. Enter the location where this item is to be delivered. Location codes identify physical locations where inventory is stored.

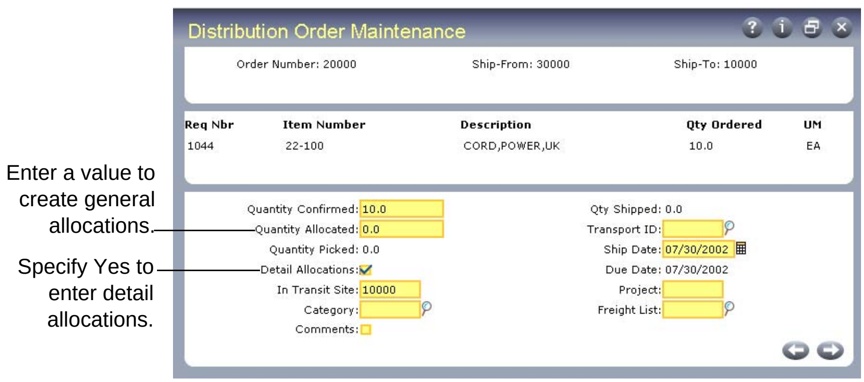
If a default location is associated with the item at the receiving site in Item Master Maintenance (1.4.1), it displays as the default receipt location on a new intersite request. When the DO is received, the location you enter here displays as the default and can be changed, as needed.

Creating General Allocations

You can create general or detail allocations in Distribution Order Maintenance for items on associated intersite requests. You can also specify a quantity picked.

- General allocations reserve inventory quantity on hand.
- Detail allocations reserve items identified by site, location, lot/serial number, and lot reference number. Allocation details print on picklists, and display as the default on shipment transactions.
- Specifying a quantity picked prevents a picklist from being printed for the detail allocation.

Fig. 14.13
Distribution Order Maintenance, Intersite Request Frame



Quantity Allocated. If you are creating a new intersite request, specify the quantity that the system should allocate for it. Specifying a quantity in this field creates general allocations. To create detail allocations, set Detail Allocations to Yes.

The sum of quantity shipped, quantity picked, and quantity allocated cannot be greater than quantity confirmed. Access to this field can be restricted through security.

You can print picklists based on the quantity allocated.

Detail Allocations. Enter Yes to display an additional pop-up for specifying allocation details. This field defaults to No, unless detail allocation records already exist. In this case, the default is Yes.

Deleting Distribution Orders

You can delete a distribution order by pressing the Delete key in the order header. The system prompts you to confirm the deletion. If you respond Yes, the system displays the following message: Delete attached intersite requests?

- Respond No to detach referenced intersite requests and leave them in the database. The system resets the status of detached requests from A (allocated) to E (exploded). These requests can then be associated with another DO.
- Respond Yes to delete the attached intersite requests as well as the distribution order. You may want to choose this option if the intersite requests associated with the DO were created dynamically in Distribution Order Maintenance.

Important If you respond Yes, all intersite requests referenced on the deleted order are deleted, regardless of how they were created. This includes requests created by DRP, in Intersite Request Maintenance, in Intersite Demand Confirmation, and in Distribution Order Maintenance. In a multiple-database environment, request detail is deleted from both the shipping and receiving site databases.

Note When you use the Delete command in the intersite request detail of a DO, the intersite request is always detached and remains in the database. It is never physically removed.

Before deleting a DO, the system verifies that items on the referenced intersite requests are not picked or shipped. This validation is performed whether you detach or physically remove the intersite requests. If the validation fails, an error displays and you cannot continue.

If items are allocated to a deleted intersite request, the allocations are removed. MRP records, including gross requirements for the shipping site and scheduled receipts for the receiving site, are updated to reflect the change.

Distribution Order Workbench

Tip
Use this when attaching an intersite demand to a distribution order is impractical.

Distribution Order Workbench (12.17.13) lets the shipping site group intersite requests and issue distribution orders based on the group. The workbench is a combination of the intersite demand and intersite order programs.

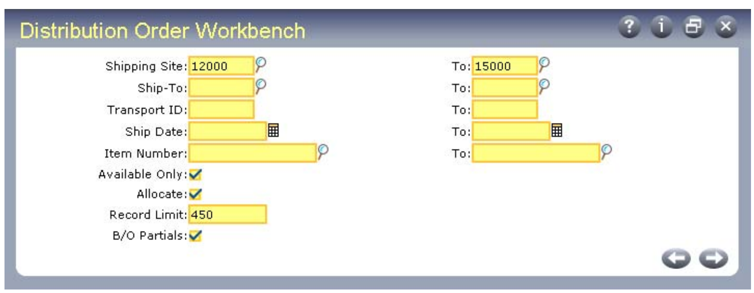
The workbench process has three steps:

- You define selection criteria to group outstanding intersite requests.
- The system creates a distribution order to satisfy these requests.
- The system determines which of the requests will be filled on the generated order.

Grouping Intersite Requests

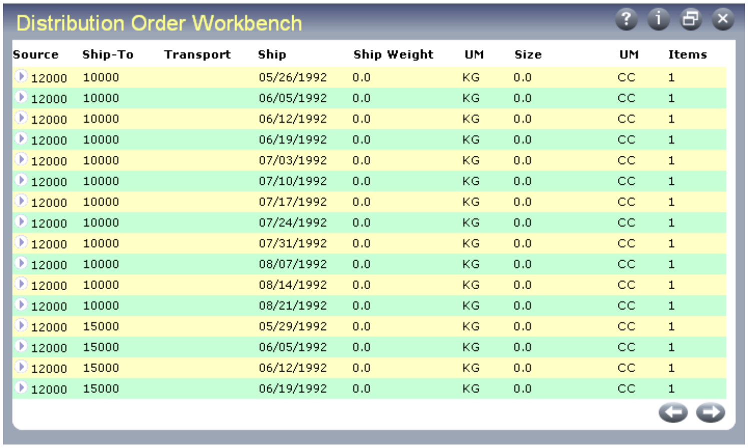
In the first step, specify selection criteria for listing requests, based on shipping site, ship-to site, transportation mode, ship date, and item number.

Fig. 14.14
Distribution Order Workbench (12.17.13)



The ship date limits the display to requests with ship dates before the specified date. If Available Only is Yes, selection stops when inventory is exhausted. If Allocate is Yes, the workbench allocates the inventory selected.

The next frame displays intersite requests matching the selection criteria. Requests are sorted first by ship-to site, then by transport mode, and finally by ship date.



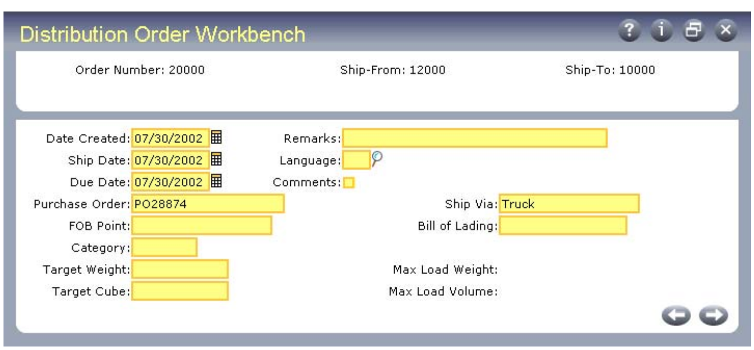
Source	Ship-To	Transport	Ship	Ship Weight	UM	Size	UM	Items
12000	10000		05/26/1992	0.0	KG	0.0	CC	1
12000	10000		06/05/1992	0.0	KG	0.0	CC	1
12000	10000		06/12/1992	0.0	KG	0.0	CC	1
12000	10000		06/19/1992	0.0	KG	0.0	CC	1
12000	10000		07/03/1992	0.0	KG	0.0	CC	1
12000	10000		07/10/1992	0.0	KG	0.0	CC	1
12000	10000		07/17/1992	0.0	KG	0.0	CC	1
12000	10000		07/24/1992	0.0	KG	0.0	CC	1
12000	10000		07/31/1992	0.0	KG	0.0	CC	1
12000	10000		08/07/1992	0.0	KG	0.0	CC	1
12000	10000		08/14/1992	0.0	KG	0.0	CC	1
12000	10000		08/21/1992	0.0	KG	0.0	CC	1
12000	15000		05/29/1992	0.0	KG	0.0	CC	1
12000	15000		06/05/1992	0.0	KG	0.0	CC	1
12000	15000		06/12/1992	0.0	KG	0.0	CC	1
12000	15000		06/19/1992	0.0	KG	0.0	CC	1

Fig. 14.15
Distribution Order Workbench (12.17.13)

The system selects all requests that share the same shipping site, ship-to site, and transportation mode. To select different requests, change the selection criteria or edit the selections after they are made.

Creating Distribution Orders

When you press Go, the system creates a distribution order to satisfy the requests. An order created in the workbench is the same as one created in Distribution Order Maintenance (12.17.14), except that you can further limit automatic selection.



Distribution Order Workbench

Order Number: 20000 Ship-From: 12000 Ship-To: 10000

Date Created: 07/30/2002
Ship Date: 07/30/2002
Due Date: 07/30/2002
Purchase Order: PO28874
FOB Point:
Category:
Target Weight:
Target Cube:
Remarks:
Language:
Comments:
Ship Via: Truck
Bill of Lading:
Max Load Weight:
Max Load Volume:

Fig. 14.16
Distribution Order Workbench (12.17.13)

Ship Date. This defaults to the earliest ship date listed on any of the selected requests.

Purchase Order. Use this field to reference an external purchase order.

Ship Via. Further limits the requests to those that have the shipping method specified. This field defaults to the value of the transport ID used to select the requests.

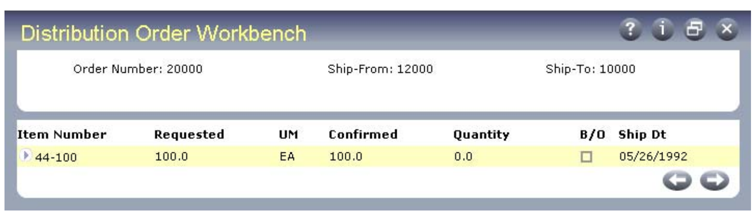
Target Weight. The system stops selecting requests when the stated target weight or target cubic measure is reached, based on summing order ship weights. The target value defaults from the maximum weight defined for that transport ID.

Target Cube. The system stops selecting requests when either this cubic measure or the target weight is reached.

Confirming Selected Requests

The system selects from the list all requests for an item until available inventory for the item is exhausted, the maximum shipping weight or size are reached, or all requests are filled. Next, it displays all selected requests and shows the total weight and space for the items. You can edit this list, which is used for picking and shipping.

Fig. 14.17
Distribution Order Workbench
(12.17.13)



Once you have confirmed them, the requests are closed. The system ships partial requests by back-ordering the difference between the request and confirmation quantities.

The item number is not shown until this point, because it is assumed that any items needed by the transport mode selected will be shipped. You can control the kinds of items attached to a distribution order by defining a different transportation mode for each item shipped.

Fig. 14.18 Distribution Order Workbench (12.17.13)

When the requests are selected, the total is shown and you are prompted to confirm. Once confirmed, you can edit the order, but automatic selection is not rerun.

Shipping Distribution Orders

Use Distribution Order Shipments (12.17.22) to record that you have sent items to another site in your company. These items are taken out of your inventory and moved to an in-transit site and location.

Multiple shipments can be made against a distribution order, with one or more shipments against each line item. You can ship more than the quantity ordered or confirmed.

Note You can also use Distribution Order Processing to ship items on a distribution order. This program lets you create the order and ship it as one process.

Figure 14.19 illustrates Distribution Order Shipments.

Fig. 14.19 Distribution Order Shipments (12.17.22)

To process a shipment, first specify the order number, which lists the line items and the quantity open.

Default Quantities to Ship

Use the Ship Allocated and Ship Picked fields to set up default quantities to ship.

- If you use picklists to control the shipping process, set Ship Picked to Yes. The quantity to ship is set to the quantity picked for each line item, and you can press Go to process the shipment.
- If you do not print a picklist but you do use allocations to reserve inventory for shipment, set Ship Allocated to Yes. This sets the quantity to ship to the quantity allocated.

When you set Ship Allocated or Ship Picked to Yes, the system automatically determines a quantity to ship and displays it on the screen, unless the items are lot/serial controlled. For these items, you must manually enter shipping information.

Shipment Processing

Enter or modify the quantity to ship, site, location, lot/serial, and reference. Set Multi Entry to Yes to enter detailed information.

When you are finished, press Go. Optionally, another screen displays a summary of what you just entered. If it is correct, press Go to process the inventory update. Otherwise, enter No or press End to go back and make additional changes.

A final screen displays the DO header for update. You can verify the shipping instructions and enter the carrier and bill of lading (BOL).

Inventory Transactions

Two transactions are created, even when the shipping and goods-in-transit sites are the same:

- Inventory issue at the shipping site (ISS-DO)
- Inventory receipt at the goods-in-transit site (RCT-GIT)

Review in-transit inventory as needed using:

- Orders in Transit Browse (12.15.13) or Report (12.15.14)
- Inventory in Transit Inquiry (12.15.17) or Report (12.15.18)

General Ledger Transactions

Shipping items on a distribution order creates the following GL transactions.

Inventory issue:

- Debits either the Intercompany Inventory Control (Debit) account for the entity associated with the shipping site or the Transfer Variance account for the site
- Credits the Inventory account defined in Inventory Account Maintenance for the applicable product line, shipping site, and location

Inventory receipt:

- Debits the Inventory account defined in Inventory Account Maintenance for the applicable product line, in-transit site, and location
- Credits either the Intercompany Inventory Control (Credit) account for the entity associated with the in-transit site or the Transfer Variance account for the site

Shipping Documents

In some business environments, formal shipping documents must accompany any movement of goods, even when goods are merely transferred and not sold. You can create a shipping document (shipper) to record the inventory movement associated with a distribution order when both of the following are true:

See *User Guide Volume 2A: Distribution* for details on shipping.

- The specified ship-from and ship-to sites belong to the same shipping group defined in Shipping Group Maintenance (2.18.1).
- The inventory movement codes associated with the applicable shipping group allow transaction type ISS-DO.

When these criteria are met, a series of frames displays for entering shipper data.

Using Distribution Order Processing

Use Distribution Order Processing (12.17.21) to access the features and frames of Distribution Order Maintenance and Distribution Order Shipments sequentially from one menu item. Distribution Order Processing supports creating and shipping orders through background processes such as CIM files or Q/LinQ application program interfaces (APIs).

For details about these processes, see:

- The chapter on the CIM Interface in *User Guide Volume 6: Master Data*
- *External Interface Guide: Q/LinQ*

You can also use Distribution Order Processing when creating and shipping distribution orders interactively to streamline these activities.

Figure 14.20 illustrates the header frame of Distribution Order Processing. The other frames that display in this program are exactly the same as those in the two related programs.

Fig. 14.20
Distribution Order Processing (12.17.21)

Enter a number identifying a new or existing distribution order. To specify a new number, Maintain Distribution Orders must be Yes. Specify the ship-from and ship-to sites and then indicate processing options:

Tip
One or both of these options must be set to Yes.

- When Maintain Distribution Orders is Yes, all of the frames that display in Distribution Order Maintenance display. This must be Yes when you specify a new order number.
- When Ship Distribution Orders is Yes, all of the frames that display in Distribution Order Shipments display. If Maintain Distribution Orders is also Yes, shipment frames follow the maintenance frames.

Receiving Distribution Orders

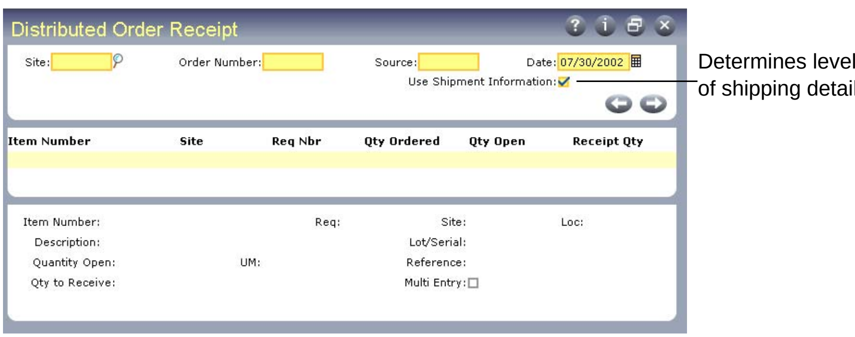
At the demand site, receive distribution order shipments with Distributed Order Receipt (12.15.20). This program:

- Records the receipt of items from distribution orders
- Transfers received items from an in-transit site and location to the site and location you specify
- Generates the appropriate transaction history and GL transaction records for each receipt

The Use Shipment Information field in Distributed Order Receipt controls the shipment detail the system uses during receipt. If Yes, the system uses full shipment detail for the default quantities and item detail being received. If No, it uses only the items and total quantities during receipt. This may be appropriate if you are entering data through CIM load.

See *User Guide Volume 9: Manager Functions* for information on CIM load.

Fig. 14.21
Distributed Order Receipt (12.15.20)



When Use Shipment Information is Yes, all issue data for the order is loaded. The quantity to receive is set equal to the open quantity, and any item detail such as lot/serial numbers, reference numbers, or locations is preserved and appears in the multi-entry window. You can alter the receipt items, quantities, or item detail if necessary, or accept the entire shipment as the default receipt.

When detailed shipment data is no longer available, set Use Shipment Information to No. This is appropriate if a stocking software is used to receive the shipment and modified data is then CIM loaded. The Qty Ordered displays the shipped quantities, but quantity to receive is set to zero.

Using CIM load for Distributed Order Receipt, you can receive a number of items for any quantity in a single transaction as long as those items do not have lot/serial, location, or reference detail. When CIM loading multi-lot/serial, location, or reference items, you can only receive a single lot/serial, location, or reference item per receipt transaction. If you attempt to receive the same item number again with unique detail, it overwrites the first receipt record.

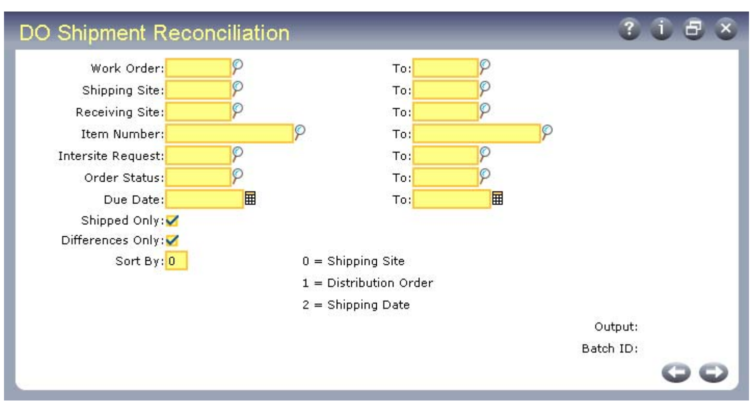
When you receive the items, received item quantities and detail are checked against the shipment detail and, where a match exists, in-transit quantities are reduced. For any items that do not match—if you receive less, or use a different lot or serial number—the shipment detail is not decremented. You can see any remaining shipment detail for an order by reentering Distributed Order Receipt and setting Use Shipment Information to Yes. You should resolve these discrepancies and correct any errors using negative quantities.

Reconciling Shipments

Use DO Shipment Reconciliation (12.17.17) to display information for distribution orders with a receipt quantity that differs from the shipment quantity.

In a multiple-database environment, this report should be run from the shipping site database. Receiving site databases must be connected in order to retrieve the receipt quantities. If they are not, an error displays in the report output.

Fig. 14.22
DO Shipment Reconciliation (12.17.17)



In a multiple-database environment, report details are derived from the shipping site's database, except for receipt quantity and last receipt date. For selected orders, the report displays:

- Inventory quantity allocated to the distribution order item, including quantity picked and quantity allocated
- Cumulative quantity shipped
- Cumulative quantity received, based on records in the receiving site's database
- Difference, if any, between the shipped quantity and received quantity

DRP Action Messages

DRP generates action messages recommending what actions a planner should take, such as rescheduling, canceling, or releasing intersite requests. Usually, you delete action messages after reviewing them so you can track which messages you have acted on. Use one of these programs:

- DRP Action Message Review/Update (12.13.5)
- Order Action Message Inquiry (12.13.6)
- DRP Action Message Report (12.13.7)
- The action message review functions in the MRP module. Both MRP and DRP action messages display in all of these functions. They are not kept separate.

To delete the messages displayed on the screen, specify Delete All. Delete Single displays each message and prompts you to delete it.

Deleted messages cannot be recovered. However, if you did not take the recommended action, the message displays again next time you run MRP and/or DRP.

The first screen selects the action messages to review, usually for a specific buyer/planner, and displays them for one item number at a time, until there are no more messages or you press End. At the bottom of each screen of messages, you can delete some or all of them.

Table 14.1 details the action messages generated by DRP.

Table 14.1
DRP Action Messages

Message	Description
Beginning quantity less than zero.	Initial nettable quantity on hand is negative.
Beginning available less than zero.	Quantity on hand less safety stock is negative.
Create intersite request.	An intersite request should be created to satisfy a negative projected on-hand balance. This message is only generated if Plan Orders is set to No, or if a new requirement appears within the time fence.
De-expedite [order type].	A scheduled intersite request is due before it is needed and should be delayed, or demand rescheduled to an earlier date.
Expedite [order type].	A scheduled intersite request is due after it is needed and should be rescheduled to an earlier date, or demand rescheduled to a later date.
Cancel [order type].	A scheduled intersite request is no longer needed and should be deleted.
Release due for [order type].	Specified supply order should be released. You can release both planned and firm-planned orders. Approving the order changes its status to firm planned. Use the Order Release Horizon field in MRP Control (23.24) to specify the number of days prior to the order release date for this action message to display.
Release past due for [order type].	Specified supply order was not released when it was due. It now needs to be released and expedited, or the demand must be rescheduled for a later date.
Quantity less than minimum [order type].	A supply order was created for a quantity less than the minimum quantity set in the item planning data. This appears only for MRP planned orders.
Quantity exceeds maximum [order type].	A supply order was created for a quantity greater than the maximum quantity set in the item planning data. This appears only for MRP planned orders.
Past due [order type].	Scheduled supply order receipt is past the due date.

Message	Description
Time fence conflict—[order type].	Unsatisfied material requirement exists inside the planning time fence for the item. MRP will not create planned orders within the time fence. You should either manually schedule and expedite orders to fill this demand or delay fulfillment of the requirement that created the demand.
Shipment due for [order type].	A shipment for an intersite request item is due. Action should be taken at the shipping site to ensure that the order is received on time.
Shipment past due for [order type].	A shipment for an intersite request item is past due. You should either delay the orders that created the requirement for the item or expedite them when the item does arrive.
No source of supply for [order type].	A valid source network is not available for the date a DRP item is required. Either the item or item-site planning data does not reference a source network, or the source network is not effective on that date.
Planned order count exceeds maximum.	An item/site combination generated the maximum number of planned orders. MRP currently cuts off the creation of orders for an item/site combination at 1000. Calculation for other items continues. This prevents runaway calculations caused by, for example, an incorrect item order quantity.

Chapter 15

Product Line Plan

Each year, after developing the initial business plan and operating budgets, companies forecast shipments, orders, and production for the upcoming year. The Product Line Plan module lets you enter these forecasts as separate plans and review and adjust relationships between them.

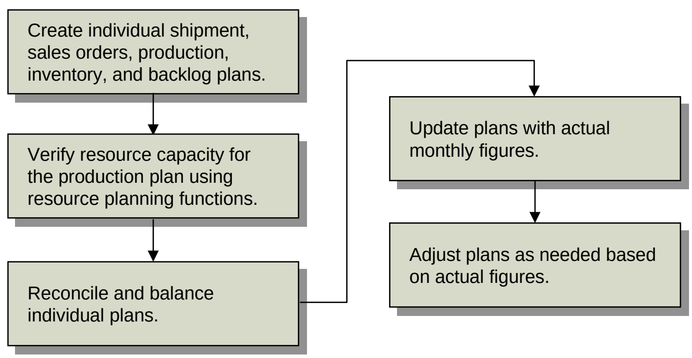
Introduction

QAD 2007 product line plans are created annually for each product line or family at a site, and are stated in thousands of currency units per calendar month.

A product line is a group of similar items or products classified together for accounting and planning purposes. You define product lines and link them to appropriate GL accounts in Product Line Maintenance (1.2.1), then assign individual items to product lines in Item Master Maintenance (1.4.1).

The product line plans usually form the basis for the master production schedule.

Fig. 15.1
Product Line Plan Process Flow



Creating Product Line Plans

Create product line plans in Product Line Plan Maintenance (20.1). You can also use the forecast-specific programs provided in this module to forecast shipments, sales orders, production, inventory, and backlog separately. Then use Product Line Plan Maintenance to reconcile differences between the separate forecasts, as needed. These forecast-specific programs also let you track individual plans by entering actual quantities as the year progresses.

Enter all product line forecasts in currency units of 1,000.

Planning Shipments

Use Shipments Plan Maintenance (20.5) to project how much of a product line you expect to ship per month from a given site and the cost of those shipments.

The difference between shipments and costs is the gross margin for that product line. The system automatically calculates monthly gross margin amounts for the product line, then divides the gross margin quantity by the projected shipment quantity for each month to obtain the gross margin percentages.

Planning Sales Orders

Use Orders Plan Maintenance (20.9) to project how many sales orders will be booked each month for a product line at a given site.

Planning Production

Use Production Plan Maintenance (20.13) to project how much of a given product line you will produce each month at a given site.

You can check the production plan against available resources using the Resource Plan module.

See Chapter 16, “Resource Plan,” on page 193.

Planning Inventory

Use Inventory Plan Maintenance (20.17) to project how much of a given product line you will have in inventory each month at a given site.

Enter a beginning inventory level and press Go to have the system automatically calculate monthly inventory forecasts. These forecasts are based on the beginning inventory value plus the production plan forecast minus the cost of shipment forecast for that month.

The inventory value indicates the relationship between production and the cost of goods sold. Production increases inventory value, while the cost of goods sold reduces it.

Some companies plan their inventory levels in terms of the number of times per year it is completely replaced in total value. To calculate inventory turns, divide the average inventory value for the year by the total cost of sales.

Planning Backlog

Use Backlog Plan Maintenance (20.21) to project the number of open orders for a given product line at a given site in each month.

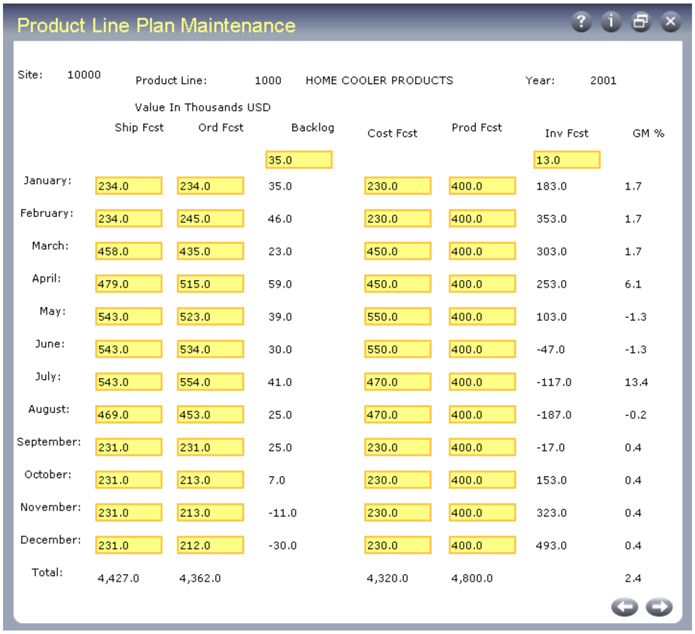
Enter a beginning backlog value and press Go to have the system automatically calculate monthly backlog forecasts. These are based on the beginning backlog value plus the sales order forecast minus the shipment forecast for that month.

Balancing Product Line Plans

Product Line Plan Maintenance (20.1) displays data from all the separate plans and automatically calculates monthly backlog and inventory forecasts and gross margin percentages.

Shipments, orders, and backlog are defined at revenue values, while cost, production, and inventory are valued at cost.

Balance the overall plan by adjusting the shipment and cost forecasts to obtain the best gross margin figure possible. Then, adjust the sales orders and shipments forecasts to balance income and balance costs against production to balance inventory.



Product Line Plan Maintenance

Site: 10000 Product Line: 1000 HOME COOLER PRODUCTS Year: 2001

Value In Thousands USD

	Ship Fcst	Ord Fcst	Backlog	Cost Fcst	Prod Fcst	Inv Fcst	GM %
			35.0			13.0	
January:	234.0	234.0	35.0	230.0	400.0	183.0	1.7
February:	234.0	245.0	46.0	230.0	400.0	353.0	1.7
March:	458.0	435.0	23.0	450.0	400.0	303.0	1.7
April:	479.0	515.0	59.0	450.0	400.0	253.0	6.1
May:	543.0	523.0	39.0	550.0	400.0	103.0	-1.3
June:	543.0	534.0	30.0	550.0	400.0	-47.0	-1.3
July:	543.0	554.0	41.0	470.0	400.0	-117.0	13.4
August:	469.0	453.0	25.0	470.0	400.0	-187.0	-0.2
September:	231.0	231.0	25.0	230.0	400.0	-17.0	0.4
October:	231.0	213.0	7.0	230.0	400.0	153.0	0.4
November:	231.0	213.0	-11.0	230.0	400.0	323.0	0.4
December:	231.0	212.0	-30.0	230.0	400.0	493.0	0.4
Total:	4,427.0	4,362.0		4,320.0	4,800.0		2.4

Fig. 15.2
Product Line Plan Maintenance (20.1)

Maintaining Product Line Plans

Individual shipments, sales orders, production, inventory, and backlog plans created using forecast-specific functions should be updated monthly or quarterly with actual figures. The system automatically subtracts actual amounts from planned amounts to calculate monthly variance and variance percentage values.

Comparing planned amounts and actual results gives you a basis for adjusting production and creating future product line plans.

Chapter 16

Resource Plan

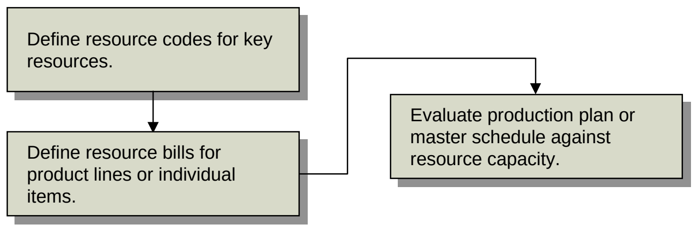
The Resource Plan module enables you to check resource loads for the product line plan and the master schedule and verify that there are enough resources to produce the projected quantities. Validate the production plan and master schedule before submitting them to MRP for detailed planning.

Introduction

The Resource Plan module lets you evaluate the feasibility of a production plan or master schedule, providing a basis for adjusting the plan or adding resources.

Resource plans indicate the load on each key resource—that is, the demand the production plan or master schedule places on that resource. Demand is then compared to that resource's capacity.

Fig. 16.1
Resource Plan Process Flow



Setting Up Resource Plans

To develop a resource plan, first identify key production resources. These are items required to manufacture finished goods that may limit production capacity and cannot be easily increased in the short term—for example, available funds, critical machines, and skilled labor.

You must also define resource bills, or load profiles, specifying the amount of each key resource required to produce one item unit or production plan unit.

Resource Codes

Define key resources in Resource Maintenance (21.1) with a unit of measure such as hours. The first reference for each resource should be the base or average resource capacity, in units, available per day for all workdays. Also define references for:

- Additional resources expected during the year, such as added shifts
- Temporary loss of resources, such as maintenance shutdowns

Include effective dates when these variances will occur.

Each resource can have multiple reference codes and capacities. The total capacity for a resource on a specific date is the cumulative capacity from all of the references in effect on that date.

The system calculates total capacity per month for each key resource using the workdays defined in the standard shop calendar for the site, multiplied by the cumulative resource capacity per day. Non-workdays and holidays are excluded from this calculation.

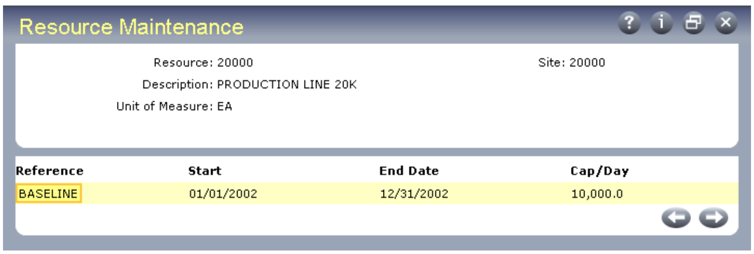


Fig. 16.2 Resource Maintenance (21.1)

Resource Bills

There are two kinds of resource bills—product line resource bills and item resource bills.

Product Line Resource Bills

A product line resource bill indicates the amount of a resource required to produce one unit of the production plan.

Use PL Resource Bill Maintenance (21.5) to define each key resource.

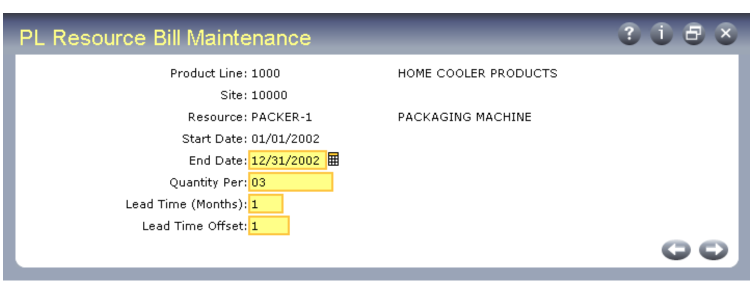


Fig. 16.3 Product Line Resource Bill Maintenance (21.5)

Quantity Per. The amount of this resource required to produce one unit of the production plan, or 1,000 currency units worth of product, stated in terms of the unit of measure defined in Resource Maintenance.

Lead Time (Months). The number of months during which a resource is required to manufacture this product line at this site.

Offset. The number of months before the start of production that this resource is needed. This may be negative if the resource is not needed until after production is complete.

Item Resource Bills

To evaluate a manufacturing schedule, define item resource bills for each individual item to be evaluated. Indicate the amount of each key resource required to manufacture one unit of that item. Specify this amount as the Resource Quantity Per in Item Resource Bill Maintenance (21.17). Item resource bills are similar to product line resource bills, except that lead time and offset are expressed in days rather than months.

See Chapter 7, "Family-Level Planning," and Chapter 8, "End-Item Planning," for more information.

Operations planning functions use item resource bills to verify the feasibility of family and operations plans and calculate resource requirements for family item and end-item production due quantities.

Calculating Resource Plans

The resource load reports and inquiries display resource load subtracted from capacity in one-month increments. A positive remainder indicates undercapacity, while negative remainders indicate overcapacity. If you are over capacity in most or all periods, reduce planned production levels or add more resources for that item or product line.

Resource load can be displayed in graph format with load calculated as percentage of capacity.

Evaluating Product Line Plans

To evaluate a product line plan—that is, to compare the capacity required by the plan with the available capacity for each resource—use PL Resource Load Summary Inquiry or Report (21.9 and 21.10) or PL Resource Load Detail Inquiry or Report (21.11 and 21.12).

The system calculates resource load using the production forecast for each product line and site and the resource quantity per entered for each product line in PL Resource Bill Maintenance. It multiplies the production plan quantity by the quantity per to determine the production load, or the number of resource units required to produce the plan.

Evaluating Manufacturing Schedules

To evaluate a manufacturing schedule—that is, compare the capacity required by the schedule with available resources—use Item Resource Load Summary Inquiry or Report (21.21 and 21.22) or Item Resource Load Detail Inquiry and Report (21.23 and 21.24).

A manufacturing schedule includes all manufacturing orders—repetitive scheduled orders and planned, firm planned, exploded, allocated, and released work orders—that identify a quantity of an item to be produced. These include master schedule work orders, MRP planned orders, repetitive schedules, and open work orders.

The item resource load reports and inquiries are similar to the product line resource load reports and inquiries.

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