

# MODULE 11: ADDITIONAL PLANNING TOPICS

## Module Overview

"Additional Planning Topics" examines planning issues that are related to the following:

- Item variants
- Inventory locations and stockkeeping units (SKUs)
- Transfers between warehouses
- Blanket sales orders
- Multilevel production orders

This material also explains how to do the following:

- Set filters in the planning worksheet.
- Change the replenishment system for a planning line.
- Refresh planning lines.

Finally, the material identifies the available planning reports.

Before starting the lessons in this module, set your work date to January 23, 2014. Please perform all lessons, demonstrations, and labs in sequence.

## Objectives

The objectives are:

- Define item variants.
- Show how to use locations and stockkeeping units in planning.
- Describe how to use blanket sales orders in planning.
- Explain how to use multilevel production orders.
- Review how to filter the planning worksheet.
- Show how to change the replenishment system for a planning line.
- Describe how to refresh planning lines.
- Identify the available planning reports.

## Item Variants

*Item variants* refer to item characteristics such as size, color, and so on. Item variants let you define different versions of items without creating a new item for each version. For example, if item A exists in blue, green, and red, then you can create an item variant for each color. Because item variants still share all information on the item card, such as planning parameters, this reduces maintenance and helps enforce consistency. Also, the program supports reporting at either the item or item variant levels.

Item variants are a basic feature of Microsoft Dynamics® NAV, and are not specific to manufacturing or planning. However, you can use item variant codes in many manufacturing and planning functions. For example, you can specify variant codes for sales lines, planning lines, and production order lines.

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 **Note:** *An item variant does not have its own bill of materials (BOM) or routing. Each item is limited to one BOM and one routing. The item BOM and routing are used across all variants of an item.*

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### Item Variants in Planning

When you specify an item variant code on a sales order line, it automatically copies to any planning lines or production order lines that are created to meet that demand. When you specify a variant code on a production BOM line, the variant code automatically copies to any production orders and planning lines that are created for that BOM line.

Whatever the source of demand, the planning system treats item variants as discrete items. An item variant only participates in planning if there is demand for that specific variant.

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 **Note:** *Although you can specify variant codes on production BOM component lines, you cannot specify a variant code for a BOM header. A BOM can apply only to an item, not to an item variant.*

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### Demonstration: Plan with Item Variants

**Scenario:** The Sales Department at CRONUS International Ltd. creates three versions of item 1000, Bicycle. All three versions are identical except for the following tube lengths in the frame:

- 23 inch
- 25 inch
- 27 inch

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To manage these versions, the company wants to create three item variants for item 1000. Acting as both the sales order processor and the production planner, perform the following tasks:

- Create the item variants.
- Create demand for the variants.
- Create planning lines to meet the demand for the variants.
- Convert the planning lines into production orders.

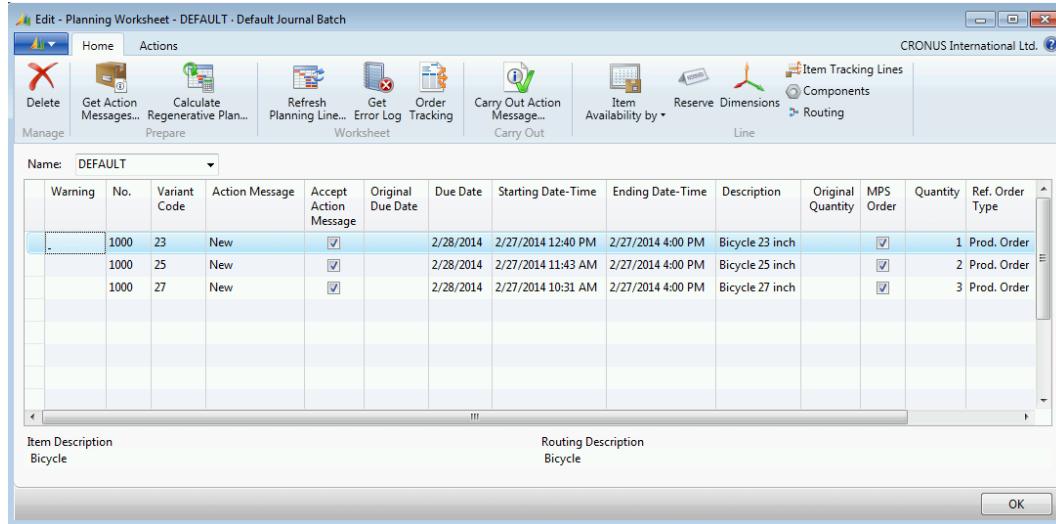
### Demonstration Steps

1. Create the three item variants for item 1000.
  - a. In the **Search** box, type "items", and then select the related link.
  - b. On the **Items** list page, double-click item 1000, Bicycle.
  - c. On the **Home** tab of the item card, click **Variants**.
  - d. On the **Item Variants** page, in the **Code** field, type "23".
  - e. In the **Description** field, type "Bicycle 23 Inch".
  - f. Repeat steps d and e on new lines to create the 25-inch and 27-inch variants.
  - g. Click **OK** to close the **Item Variants** page. This returns you to the item card.
  - h. Expand the **Planning** FastTab.
  - i. In the **Reordering Policy** field, select Order.
  - j. Click **OK** to close the item card.
2. Create a sales order for the variants.
  - a. In the **Search** box, type "sales orders", and then select the related link.
  - b. On the **Home** tab of the **Sales Orders** list page, click **New**, and then press **Enter**.
  - c. On the **General** FastTab of the sales order card, in the **Sell-to Customer No.** field, type "20000". Accept any messages.
  - d. Set the **Requested Delivery Date** field to February 28, 2014.
  - e. On the **Lines** FastTab, in the **Type** field, select Item.
  - f. In the **No.** field, type "1000".
  - g. Use the **Choose Columns** function to add the **Variant Code** field to the **Lines** FastTab. Position it after the **Description** field.
  - h. In the **Variant Code** field, type "23".
  - i. In the **Quantity** field, type "1". Accept any messages.
  - j. On a new line, repeat steps e to i, except type "25" in the **Variant Code** field, and type "2" in the **Quantity** field.

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- k. On a new line, repeat steps e to i, except type "27" in the **Variant Code** field, and type "3" in the **Quantity** field.
    - l. Click **OK** to close the sales order card.
  3. Generate planning lines for the new sales order.
    - a. In the **Search** box, type "planning worksheets", and then select the link for Planning Worksheets – Departments/Manufacturing/Planning.
    - b. If any planning lines currently exist in the planning worksheet, click the cell in the upper-left corner of the table section of the worksheet. This selects all planning lines. Then, on the **Home** tab, click **Delete**. On the request message, click **Yes** to confirm the deletion. All the planning lines disappear. This leaves the planning worksheet empty.
    - c. On the **Home** tab, click **Calculate Regenerative Plan**.
    - d. On the **Options** FastTab of the **Calculate Plan – Plan. Wksh.** request page, select the check box for the **MPS** field, and clear the check box for the **MRP** field.
    - e. Set the **Starting Date** field to February 01, 2014.
    - f. Set the **Ending Date** field to February 28, 2014.
    - g. In the **Use Forecast** field, delete the existing value.
    - h. On the **Item** FastTab, in the **No.** filter field, type "1000". Clear all other filters.
    - i. Click **OK** to run the batch job. Notice that the planning system creates three planning lines, one for each line that you created on the sales order.
    - j. Use the **Choose Columns** feature to add the **Variant Code** field to the planning worksheet. Position it after the **No.** field. Notice that the planning lines contain the variant codes that you used in step 2.

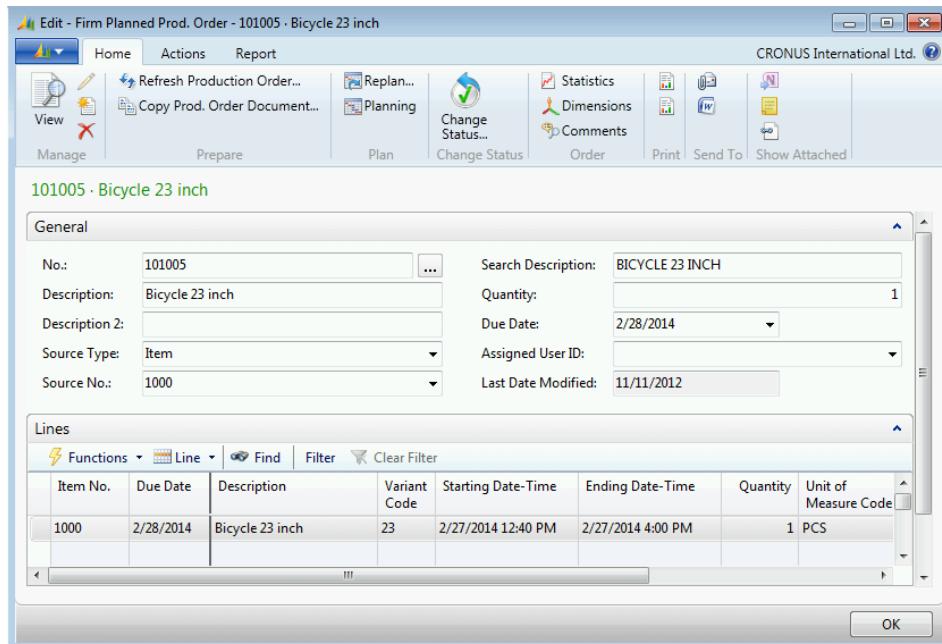
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**FIGURE 11.1:PLANNING LINES FOR ITEM VARIANTS**

4. Create production orders from the planning lines.
  - a. On the planning worksheet, select the check box in the **Accept Action Message** field for all three planning lines.
  - b. On the **Home** tab, click **Carry Out Action Message**.
  - c. On the **Options** FastTab of the **Carry Out Action Msg. – Plan** request page, in the **Production Order** field, select Firm Planned.
  - d. Click **OK** to start the batch job.
  - e. Click **OK** to close the planning worksheet.
5. Review one of the production orders that you created in step 4.
  - a. In the **Search** box, type “Firm Planned Prod. Orders”, and then select the related link.
  - b. On the **Firm Planned Prod. Orders** list page, double-click the line for the production order for the Bicycle 23 Inch item variant.
  - c. On the **Lines** FastTab of the production order card, use the **Choose Columns** function to add the **Variant Code** field to the production order lines. Position it after the **Description** field. Notice that the production order line contains the variant code that you used in step 2.

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**FIGURE 11.2:PRODUCTION ORDER LINE WITH VARIANT CODES**

- d. Click **OK** to close the production order card.

## Item Variants in Output

When production orders contain item variants, the program records the variant codes in the output journal and item ledger entries. This means that item variants participate in the whole sales and production cycle. This includes the following:

- Sales order entry
- Planning
- Production order entry
- Production order processing up to and including output
- Shipment of finished goods to customers.

## Locations and Stockkeeping Units

Microsoft Dynamics NAV manufacturing can use an inventory location in one of the following two ways:

- As an item modifier that is used and tracked throughout the sales and production cycles.
- On a stockkeeping unit (SKU) to refine the use of planning parameters. This lets you plan production in different locations with different planning parameter values. If locations are mandatory, you must set up SKUs for items.

### Single Location in Planning

When the sales order line specifies a location, the same location code automatically copies to any planning line that is created to fulfill that sales order line. If you carry out the action message that is associated with the planning line, the location code then copies to the corresponding supply order. If the supply order is a production order, the location code copies to the production order header and the production order lines. When you record output for the production order, the location code then copies to the output journal and the item ledger entries.

A similar flow occurs for components in a single location scenario. When the program creates or refreshes the component lines for a planning line or a production order that is created specifically to fulfill a sales order line, the location code specified on the sales order line automatically copies to all the component lines. The same location then copies from the component lines to the consumption journal. Again, this is for a single location without other location-related setup.

### Demonstration: Plan for a Single Location

**Scenario:** Susan, the order processor at CRONUS, receives a sales order for four units of item 1000, Bicycle, from customer 10000, The Cannon Group PLC. The order is due on February 28, 2014. Customer 10000 is assigned to the BLUE location. Therefore, the program automatically assigns the BLUE location to the sales order.

Eduardo, the production planner at CRONUS, runs the planning worksheet to create a planning line for the sales order line. He then carries out the associated action message to create a production order. Finally, he verifies that the production order line for the finished good, and for all the production order's component lines, specify the BLUE location.

### Demonstration Steps

1. Create a sales order for four units of item 1000.
  - a. In the **Search** box, type "sales orders", and then select the related link.
  - b. On the **Home** tab of the **Sales Orders** list page, click **New**, and then press **Enter**.
  - c. On the **General** FastTab of the sales order card, in the **Sell-to Customer No.** field, type "10000".
  - d. Set the **Requested Delivery Date** field to February 28, 2014.
  - e. On the **Lines** FastTab, in the **Type** field, select Item.
  - f. In the **No.** field, type "1000". Notice that the **Location Field** automatically changes to BLUE.

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- g. In the **Quantity** field, type "4". Accept any messages.
    - h. Click **OK** to close the sales order card.
  2. Generate a planning line for the new sales order.
    - a. In the **Search** box, type "planning worksheets", and then select the link for Planning Worksheets – Departments/Manufacturing/Planning.
    - b. On the **Home** tab of the planning worksheet, click **Calculate Regenerative Plan**.
    - c. On the **Options** FastTab of the **Calculate Plan – Plan. Wksh.** request page, select the check box for the **MPS** field, and clear the check box for the **MRP** field.
    - d. Set the **Starting Date** field to February 01, 2014.
    - e. Set the **Ending Date** field to February 28, 2014.
    - f. In the **Use Forecast** field, delete the existing value.
    - g. Leave all other fields as they are, and then click **OK** to calculate the plan. Notice that the planning system creates one planning line to meet the demand of the new sales order.
    - h. Use the **Choose Columns** feature to add the **Location Code** field to the planning worksheet. Position it after the **No.** field. Notice that the **Location Code** field now appears in the planning worksheet, and that the field contains the value BLUE.
  3. Create a production order from the planning line.
    - a. On the planning worksheet, select the **Accept Action Message** field for the planning line.
    - b. On the **Home** tab, click **Carry Out Action Message**.
    - c. On the **Options** FastTab of the **Carry Out Action Msg. – Plan** request page, in the **Production Order** field, select Firm Planned.
    - d. Click **OK** to start the batch job.
    - e. Click **OK** to close the planning worksheet.
  4. Review the production order line and its component lines.
    - a. In the **Search** box, type "Firm Planned Prod. Orders", and then select the related link.
    - b. On the **Firm Planned Prod. Orders** list page, double-click the line for the production order for four units of item 1000, Bicycle.
    - c. On the **Lines** FastTab of the production order card, use the **Choose Columns** function to add the **Location Code** field to the production order line. Position it after the **Description** field. Notice that the **Location Code** field on the production order line is set to BLUE.

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- d. Select the production order line. Click **Line**, and then click **Components**.
- e. On the **Prod. Order Components** page, use the **Choose Columns** function to add the **Location Code** field to the component lines. Position it after the **Description** field. You must close and reopen the **Prod. Order Components** page for this change to take effect. When you reopen the **Prod. Order Components** page, notice that the **Location Code** field is set to **BLUE** for all component lines.

Item No.	Due Date	Description	Location Code	Quantity per	Unit of Measure...	Flushing Method	Expected Quantity	Remaining Quantity	Substitution Available	Bin Code
1100	2/26/2014	Front Wheel	BLUE	1	PCS	Manual	4	4	No	
1200	2/26/2014	Back Wheel	BLUE	1	PCS	Manual	4	4	No	
1300	2/26/2014	Chain Assy	BLUE	1	PCS	Manual	4	4	No	
1400	2/26/2014	Mudguard front	BLUE	1	PCS	Manual	4	4	No	
1450	2/26/2014	Mudguard back	BLUE	1	PCS	Manual	4	4	No	
1500	2/26/2014	Lamp	BLUE	1	PCS	Manual	4	4	No	
1600	2/26/2014	Bell	BLUE	1	PCS	Manual	4	4	No	
1700	2/26/2014	Brake	BLUE	1	PCS	Manual	4	4	No	
1800	2/26/2014	Handlebars	BLUE	1	PCS	Manual	4	4	No	

FIGURE 11.3:LOCATION CODES ON PRODUCTION ORDER COMPONENT LINES



**Note:** Similar to how item variant codes flow through to the output journal and item ledger entries, the location code that is specified on production order component lines automatically copies to the **Location Code** field on consumption journal entries and item ledger entries. Again, this demonstration assumes a simple setup that involves only one location.

### Multiple Locations in Planning

Microsoft Dynamics NAV supports planning for multiple locations. You can specify locations for the following types of orders:

- Sales
- Production
- Assembly
- Purchase
- Transfer
- Service

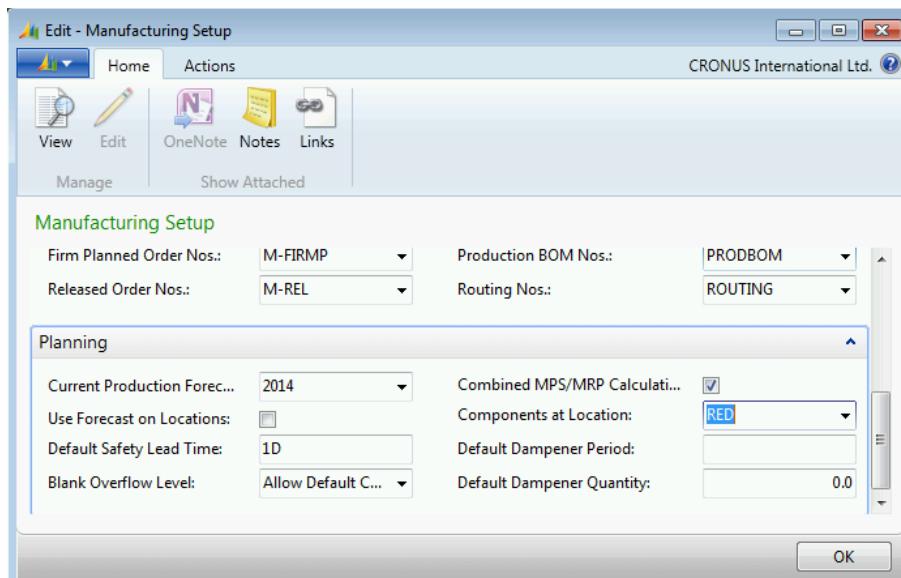
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Additionally, for production orders and assembly orders, you can specify one location for the finished good item, and a different location for components, or even a different location for each component.

For finished goods, the program assumes that items are manufactured at the same location where they are shipped. This is why the location that was specified on the sales order line automatically copies to any planning line or production order that you generate specifically to meet the sales order demand. If you sell an item from the BLUE location, and you want to manufacture the item at the GREEN location, then you must use stockkeeping units to achieve this with any degree of efficiency. For more information, refer to the "Stockkeeping Units" topic and its related demonstrations.

You can also use stockkeeping units to consume components at a location that differs from the manufacturing location. However, if you consume components from only one location, you can specify this by using the following steps.

1. Close all open pages.
2. In the **Search** box, type "manufacturing setup", and then select the related link.
3. On the **Manufacturing Setup** page, expand the **Planning** FastTab.
4. In the **Components at Location** field, select the location where you want to consume components regardless of the manufacturing location.



**FIGURE 11.4:MANUFACTURING SETUP PAGE**

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On the **Planning** FastTab, suppose that you select the RED location in the **Components at Location** field, as shown in the "Manufacturing Setup Page" image. Then the program consumes all components from the RED location regardless of the location that is specified on a planning line or production order line.

If you use stockkeeping units, you can specify a components location for each stockkeeping unit. This value overrides the value that is specified in the **Manufacturing Setup** page.

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 **Note:** Do not select a location in the **Components at Location** field on the **Manufacturing Setup** page at this time.

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### Stockkeeping Units

The stockkeeping unit (SKU) is an extension of the item card and states the inventory and planning parameters for items and their variants for each location. By centralizing this information on the SKU, the program can calculate plans for items or item variants at specific locations.

The SKU does not have its own BOM or routing. Therefore, you cannot create a different BOM or routing for each SKU. All SKUs for an item share the production BOM and routing that is assigned to that item.

You do not have to define a SKU for every combination of item, location, and variant that is stated in the demand. If no SKU exists for a combination, the system uses the basic information from the item card.

When you create a SKU, you have several options that make it possible to operate in multiple locations. These include the following:

- You can change the replenishment system to Transfer and specify a transfer-from location. This lets you shift the responsibility for manufacturing an item to a location that differs from the one that was specified on a sales order line.
- You can specify a location for component consumption for a SKU that differs from the manufacturing location.
- You can change the planning parameters on a SKU so that they are specific to a location and/or item variant.

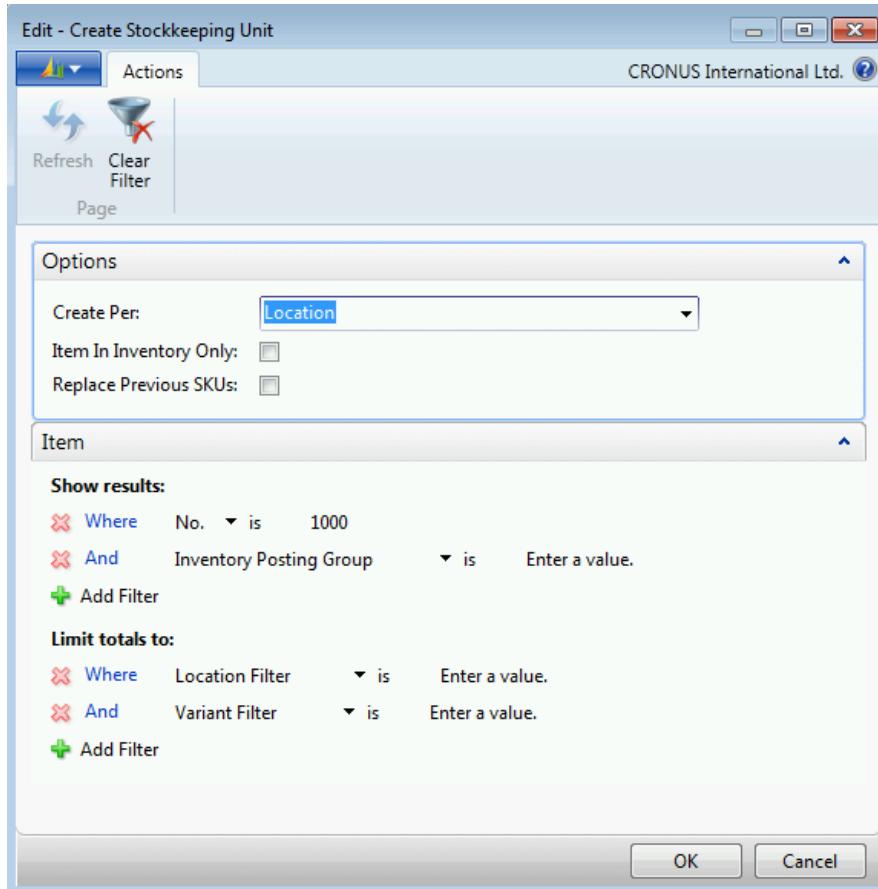
## Demonstration: Use a SKU to Manufacture at a Different Location

**Scenario:** All locations sell and distribute item 1000, Bicycle. Therefore, Eduardo, the production planner at CRONUS, sets up SKUs for item 1000 for each location. For the SKU for item 1000 at the BLUE location, Eduardo decides to manufacture supply at the RED location. This requires him to change the replenishment system for the SKU for the BLUE location from Prod. Order to Transfer. He must also specify the RED location as the transfer-from location.

Shortly after Eduardo finishes this setup, Susan, the order processor at CRONUS, creates a sales order for five units of item 1000, due on February 22, 2014. The order is for customer 10000, The Canon Group PLC. This customer is assigned to the BLUE location. Eduardo runs the planning worksheet to create a planning line for the sales order line and checks the results.

### Demonstration Steps

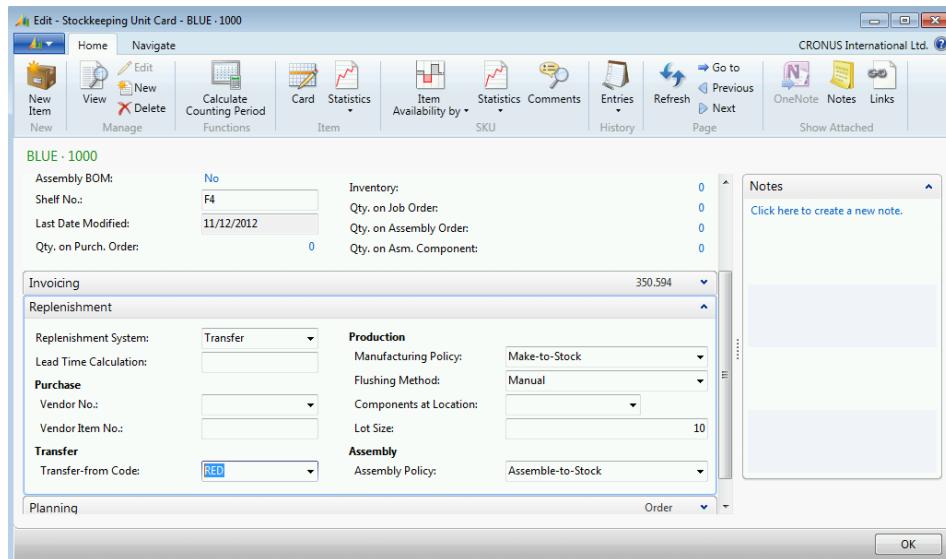
1. Create SKUs for item 1000 for all locations.
  - a. Close all open pages.
  - b. In the **Search** box, type "items", and then select the related link.
  - c. On the **Items** list page, double-click the line for item 1000, Bicycle.
  - d. On the **Actions** tab of the item card, click **Create Stockkeeping Unit**.
  - e. On the **Options** FastTab of the **Create Stockkeeping Unit** page, in the **Create Per** field, select Location.



**FIGURE 11.5:CREATE STOCKKEEPING UNIT PAGE**

- f. Click **OK** to run the batch job. When the batch job finishes, it returns you to the item card.
2. Set up the SKU for item 1000 at the BLUE location to use a replenishment system of Transfer. Specify the RED location as the transfer-from location.
  - a. On the **Navigate** tab of the item card, click **Stockkeeping Units**.
  - b. On the **Stockkeeping Unit List** page, double-click the line for the BLUE location.
  - c. On the stockkeeping unit card, expand the **Replenishment** FastTab.
  - d. In the **Replenishment System** field, select Transfer.
  - e. In the **Transfer-from Code** field, select RED.

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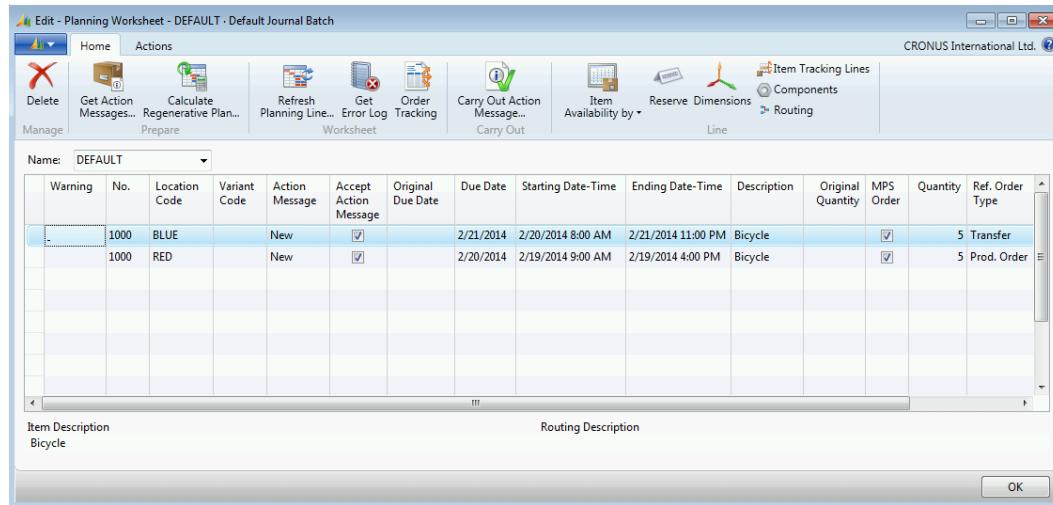


**FIGURE 11.6:STOCKKEEPING UNIT CARD**

- f. Click **OK** to close the stockkeeping unit card.
  - g. Press **Esc** two times to return to the **Items** list page.
- 
3. Create the sales order for five units of item 1000 at the BLUE location.
    - a. In the **Search** box, type "sales orders", and then select the related link.
    - b. On the **Home** tab of the **Sales Orders** list page, click **New**, and then press **Enter**.
    - c. On the **General** FastTab of the sales order card, in the **Sell-to Customer No.** field, type "10000".
    - d. Set the **Requested Delivery Date** field to February 22, 2014.
    - e. On the **Lines** FastTab, in the **Type** field, select Item.
    - f. In the **No.** field, type "1000". Notice that the **Location Field** automatically changes to BLUE.
    - g. In the **Quantity** field, type "5". Accept any messages.
    - h. Click **OK** to close the sales order card.
  
  4. Run the planning worksheet for item 1000, and then check the results.
    - a. In the **Search** box, type "planning worksheets", and then select the link for Planning Worksheets – Departments/Manufacturing/Planning.
    - b. On the **Home** tab of the planning worksheet, click **Calculate Regenerative Plan**.
    - c. On the **Options** FastTab of the **Calculate Plan – Plan. Wksh.** request page, select the check box for the **MPS** field, and clear the check box for the **MRP** field.

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- d. Set the **Starting Date** field to February 01, 2014.
- e. Set the **Ending Date** field to February 28, 2014.
- f. In the **Use Forecast** field, delete the existing value.
- g. Leave all other fields as they are, and then click **OK** to calculate the plan. Notice that the planning system creates two planning lines. One planning line suggests a transfer for five units of item 1000 from the RED location to the BLUE location. The second planning line suggests a production order of five units of item 1000 for the RED location.



**FIGURE 11.7:PLANNING WORKSHEET WITH RELATED TRANSFER ORDER AND PRODUCTION ORDER**

5. Review the component lines that are generated for the suggested production order.
  - a. On the planning worksheet, select the planning line for the production order of five units of item 1000 at the RED location.
  - b. On the **Home** tab, click **Components**.
  - c. On the **Planning Components** page, use the **Choose Columns** function to add the **Location Code** field. Position it after the **Description** field. Notice that all components reference the RED location.
  - d. Press **Esc** two times to close the open pages.

### Demonstration: Use a SKU to Plan Components

This is a continuation of the "Use a SKU to Manufacture at a Different Location" demonstration.

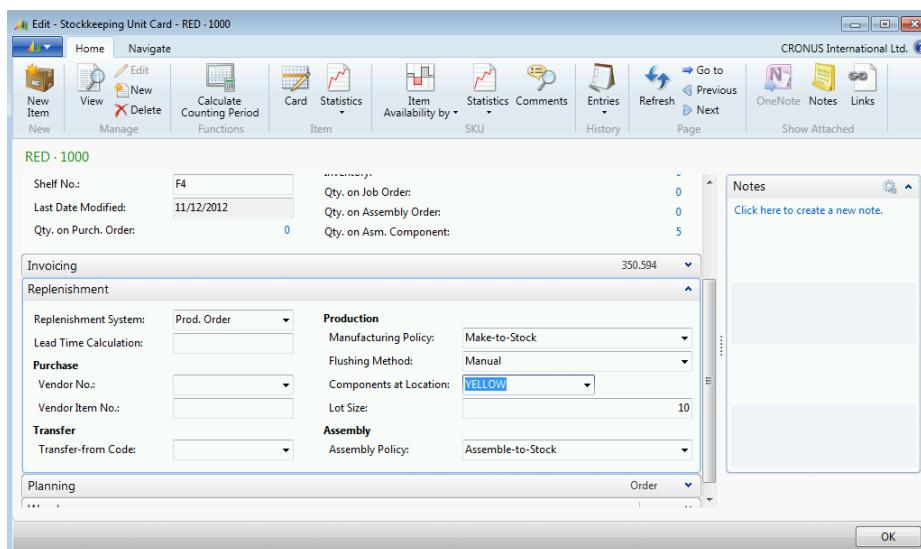
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**Scenario:** After Eduardo, the production planner at CRONUS, runs the planning worksheet for item 1000, he decides that all production orders for item 1000 at the RED location must consume components from the YELLOW location. To implement this, he must specify the YELLOW location in the **Components at Location** field on the **Replenishment** FastTab of the SKU card for item 1000 at the RED location.

To verify that this setup works, he must refresh the planning line for the production order in the planning worksheet, and then check the location that is specified for the components.

## Demonstration Steps

1. Set up the SKU for item 1000 at the RED location to consume components at the YELLOW location.
  - a. In the **Search** box, type "items", and then select the related link.
  - b. On the **Items** list page, double-click the line for item 1000.
  - c. On the **Navigate** tab of the item card, click **Stockkeeping Units**.
  - d. On the **Stockkeeping Unit List** page, double-click the line for the RED location.
  - e. On the stockkeeping unit card, expand the **Replenishment** FastTab.
  - f. On the **Replenishment** FastTab, in the **Components at Location** field, select YELLOW, and then press **Enter**.



**FIGURE 11.8:SKU THAT SPECIFIES A COMPONENTS AT LOCATION VALUE**

- g. Press **Esc** three times to return to the **Items** list page.

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2. In the planning worksheet, refresh the planning line that suggests a production order for five units of item 1000, and then check the results.
  - a. In the **Search** box, type “planning worksheets”, and then select the link for Planning Worksheets – Departments/Manufacturing/Planning.
  - b. On the planning worksheet, select the planning line that suggests a production order for five units of item 1000 at the RED location.
  - c. On the **Home** tab, click **Refresh Planning Line**.
  - d. On the **Refresh Planning Demand** request page, accept the default values and click **OK** to run the batch job.
  - e. On the **Home** tab of the planning worksheet, click **Components**. On the **Planning Components** page, notice that all components now specify a location code of YELLOW.
  - f. Press **OK** to close the **Planning Components** page.

### Demonstration: Use a SKU to Change Planning Parameters for a Component

This is a continuation of the “Use a SKU to Plan Components” demonstration.

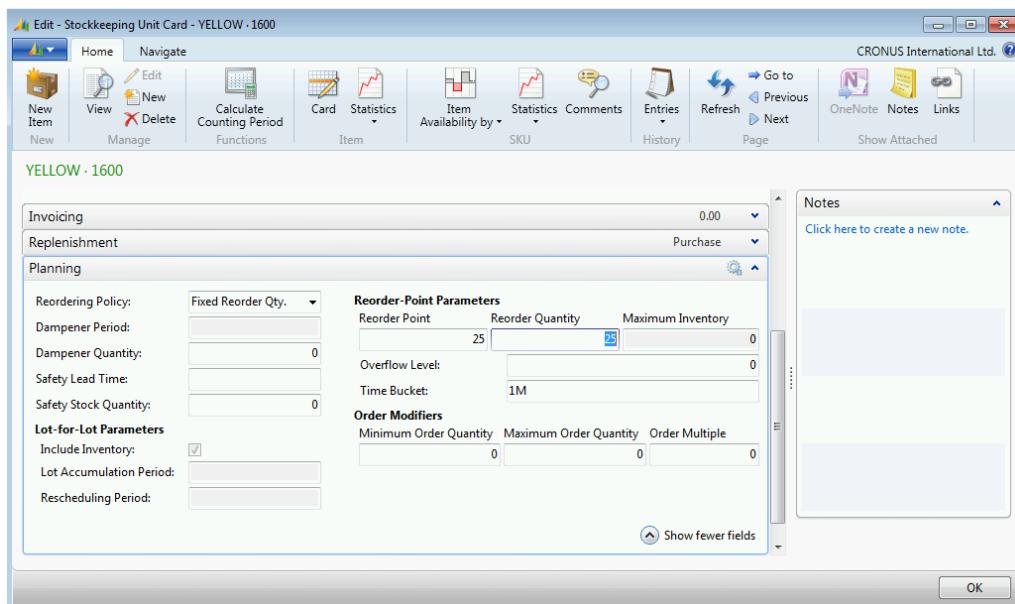
**Scenario:** After he runs the planning worksheet for item 1000, Eduardo, the production planner at CRONUS, decides to run both MPS and MRP for item 1000 and item 1600. He wants to see what effect, if any, that consuming components at the YELLOW location has on overall component inventories. When he sees that the effect is significant, he decides to create a SKU for item 1600 at the YELLOW location so that he can exert more control over its planning parameters.

#### Demonstration Steps

1. Run MPS and MRP for items 1000 and 1600.
  - a. On the **Home** tab of the planning worksheet, click **Calculate Regenerative Plan**.
  - b. On the **Options** FastTab of the **Calculate Plan – Plan. Wksh.** request page, select the check boxes for MPS and MRP.
  - c. Set the **Starting Date** field to February 01, 2014.
  - d. Set the **Ending Date** field to February 28, 2014.
  - e. In the **Use Forecast** field, delete the existing value.
  - f. On the **Item** FastTab, in the **No.** filter field, type “1000|1600”.

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- g. Click **OK** to run the batch job. Notice that in addition to the two planning lines for item 1000, there are now two planning lines for item 1600, Bell. Ignore the line for the BLUE location. However, closely examine the line for item 1600 at the YELLOW location. The suggested order quantity of 200 units is too high for that location. Eduardo therefore decides he must create a SKU for item 1600 at the YELLOW location, and then modify its planning parameters.
  - h. Click **OK** to close the planning worksheet.
2. Create a SKU for item 1600 at the YELLOW location.
    - a. In the **Search** box, type “stockkeeping units”, and then select the related link.
    - b. On the **Home** tab of the **Stockkeeping Units** list page, click **New**.
    - c. On the **General** FastTab of the stockkeeping unit card, in the **Item No.** field, type “1600”, and then press **Enter** or **Tab**. Ignore the errors and warning message.
    - d. In the **Location Code** field, select **YELLOW**, and then press **Enter** or **Tab**.
    - e. Expand the **Planning** FastTab.
    - f. In the **Reorder Point** field, change the value from 100 to 25.
    - g. In the **Reorder Quantity** field, change the value from 100 to 25.



**FIGURE 11.9:SKU CARD WITH CHANGED PLANNING PARAMETERS**

- h. Click **OK** to close the stockkeeping unit card.

## Module 11: Additional Planning Topics

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3. Rerun the planning worksheet for items 1000 and 1600.
  - a. In the **Search** box, type “planning worksheets”, and then select the link for Planning Worksheets – Departments/Manufacturing/Planning.
  - b. Repeat step 1. Notice that the suggested order quantity for the planning line for item 1600 at the YELLOW location drops from 200 units to 50 units. This is an example of how you can use stockkeeping units to apply different planning parameters to different combinations of item and location. You can refine this further by adding an item variant to the stockkeeping unit definition.
  - c. Press **OK** to close the planning worksheet.

### Manual Transfer Orders and Planning

Similar to production orders and purchase orders, transfer order lines contain a **Planning Flexibility** field to determine whether the planning system considers their supply when it calculates action messages. This is useful if you have to move inventory quantities to another location regardless of existing demand. To achieve this, you manually create a transfer order. To prevent the planning system from changing this transfer order during a planning run, you set the value in the order line’s **Planning Flexibility** field to None.

On the other hand, to let the planning system adjust the transfer order quantities or dates to meet existing demand, you can leave the **Planning Flexibility** field set to its default value of Unlimited.

### Blanket Sales Orders

Some manufacturers do not use forecasts. For these companies, the program provides an option to plan that is based on blanket sales orders. A *blanket sales order* is a sales agreement that covers the following:

- Fixed item quantities
- Fixed price or discounted price
- Fixed delivery dates

With regard to planning, the main advantages of using blanket sales orders are stability and precision. Instead of forecasting demand, production planners can rely on specific agreements that are reached between the company and its customers.

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The following characteristics apply to blanket sales orders and planning:

- A blanket sales order is a source of independent demand.
- The system does not track blanket sales orders.
- A sales order that originates from a blanket sales order consumes some or all of the blanket order.
- A sales order that originates from a blanket sales order does not consume forecast.
- When the program calculates blanket sales order consumption, the shipment date of the linked sales order is irrelevant.

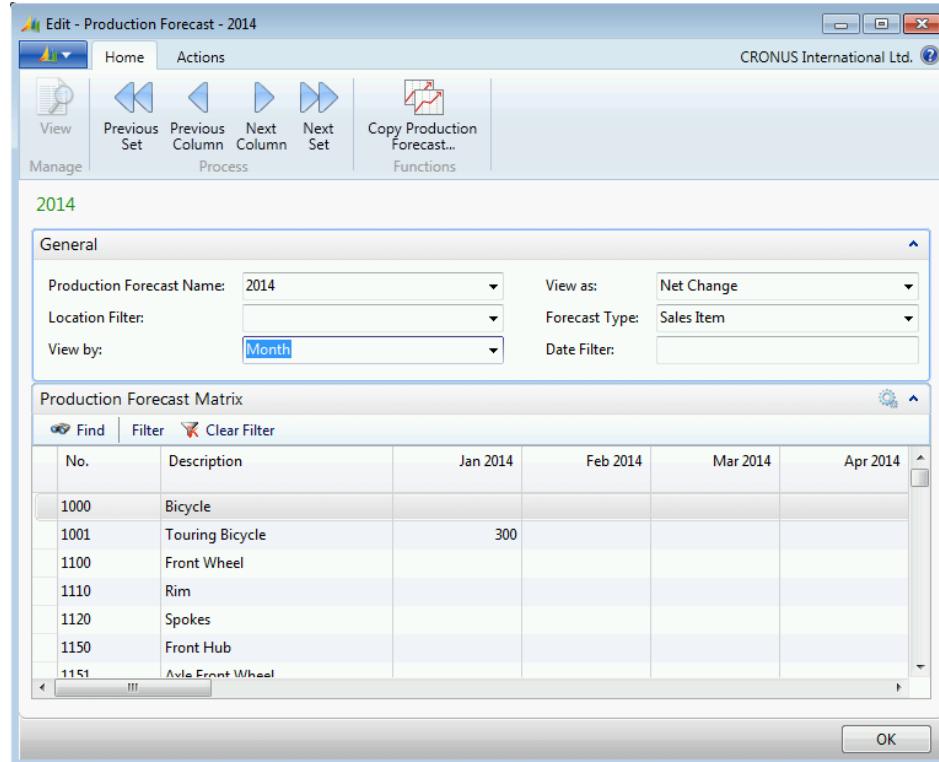
## Demonstration: Plan with a Blanket Sales Order

**Scenario:** Eduardo, the production planner at CRONUS, enters a production forecast for 300 units of item 1001, Bicycle, for January, 2014. Susan, the order processor at CRONUS, then registers a blanket sales order for 400 units of item 1001 for customer 20000, Selangorian Ltd. This blanket order must be fulfilled in 200 unit deliveries each month for January and February, 2014. Shortly after she creates the blanket order, Susan creates a sales order for the first delivery, due January 28, 2014. After each event, Eduardo runs the planning worksheet for item 1001 and assesses the results.

### Demonstration Steps

1. Create the production forecast for 300 units of item 1001 in January, 2014.
  - a. In the **Search** box, type "production forecasts", and then select the related link.
  - b. On the **Production Forecasts** list page, double-click the line for the 2014 Forecast.
  - c. On the **General** FastTab of the **Production Forecast** page, in the **View by** field, select Month.
  - d. In the **Forecast Type** field, select Sales Item.
  - e. On the line for item 1001, Touring Bicycle, in the column for January, 2014, type "300".

## Module 11: Additional Planning Topics



## **FIGURE 11.10:PRODUCTION FORECAST PAGE**

- f. Click **OK** to close page.
  2. Calculate a plan for item 1001, Touring Bicycle, for January, 2014.
    - a. In the **Search** box, type “planning worksheets”, and then select the link for Planning Worksheets – Departments/Manufacturing/Planning.
    - b. Delete any planning lines that are currently in the worksheet.
    - c. On the **Home** tab of the planning worksheet, click **Calculate Regenerative Plan**.
    - d. On the **Options** FastTab of the **Calculate Plan – Plan. Wksh.** request page, select the check box for the **MPS** field, and clear the check box for the **MRP** field.
    - e. Set the **Starting Date** field to January 01, 2014.
    - f. Set the **Ending Date** field to January 31, 2014.
    - g. In the **Use Forecast** field, select 2014.
    - h. On the **Item** FastTab, in the **No.** filter field, type “1001”.
    - i. Click **OK** to run the batch job. Notice that the planning system creates only one planning line for 300 units. This is in response to your 2014 Forecast.
    - j. Click **OK** to close the planning worksheet.

## Manufacturing in Microsoft Dynamics® NAV 2013

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3. Add a blanket sales order for 400 units of item 1001 for delivery in the first two months of 2014.
  - a. In the **Search** box, type "blanket sales orders", and then select the related link.
  - b. On the **Home** tab of the **Blanket Sales Orders** list page, click **New**, and then press **Enter**.
  - c. On the **General** FastTab of the order card, in the **Sell-to Customer No.** field, type "20000".
  - d. Leave the **Order Date** field blank. When you generate sales orders from a blanket sales order, the sales order date is set to equal the program's work date.
  - e. On the **Lines** FastTab, in the **Type** field, select Item.
  - f. In the **No.** field, type "1001".
  - g. In the **Quantity** field, type "200".
  - h. Set the **Shipment Date** field to January 28, 2014.
  - i. Repeat steps e through h to create one more order line, but increment the shipment date by one month to February 28, 2014. Notice that the **Qty. to Ship** field fills in automatically on each line. This is the quantity that the program assigns to a sales order that is generated from the blanket sales order.
  - j. Click **OK** to close the blanket sales order card.
4. Rerun the planning worksheet for item 1001.
  - a. Repeat step 2. Notice that the planning system now calculates two planning lines. It suggests one to meet the demand from the forecast, and a second to meet the demand from the blanket sales order. Notice that the quantity on the blanket sales order for item 1001 for January, 2014, does not consume the sales forecast for item 1001 for the same period.
  - b. Click **OK** to close the planning worksheet.
5. Create the first sales order for 200 units of item 1001, due January 28, 2014.
  - a. In the **Search** box, type "blanket sales orders", and then select the related link.
  - b. On the **Blanket Sales Orders** list page, double-click the line for blanket sales order for customer 20000, Selangorian Ltd.
  - c. On the **Lines** FastTab of the order card, delete the quantity in the **Qty. to Ship** field for the second line. This is the line with the shipment date of February 28, 2014.
  - d. On the **Home** tab, click **Make Order**.
  - e. On the request message, click **Yes** to make the order. Accept any messages.

## Module 11: Additional Planning Topics

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- f. Click **OK** to close the confirmation message that states that an order is created from the blanket order.
  - g. Click **OK** to close the blanket sales order card.
6. Rerun the planning worksheet for item 1001.
- a. Repeat step 2. Notice that the planning system calculates the same two planning lines as previously. The sales order that is created from the blanket sales order consumes the blanket order, but does not consume the forecast.

## Multilevel Production Orders

In Microsoft Dynamics NAV, you can create multilevel production orders. This lets you manage all production order levels of a manufactured item because the parent item and the required subassemblies are order lines on the same production order. Reservation links between the order lines make sure that all subassembly output is used to supply the component requirements of the parent item.

This approach provides production planners with a good overview of related production orders. However, the reservation links between the related order lines create several restrictions. Therefore, multilevel production orders should only be used in environments where there is a need to have a visible relationship between production orders. Otherwise, it is the role of the MRP planning engine to fulfill all component requirements.

Typically, you use multilevel production orders in a Make-To-Order (MTO) environment, where companies manufacture products specifically for a customer sales order. To create a multilevel production order, you must set the manufacturing policy for all order items to Make-to-Order.

### Demonstration: Combine Parent Items and Components on one Production Order

**Scenario:** Eduardo, the production planner at CRONUS, wants to make sure that component subassemblies 1100, Front Wheel, and 1200, Back Wheel, are included in the same production order as one of their parent items, item 1000, Bicycle.

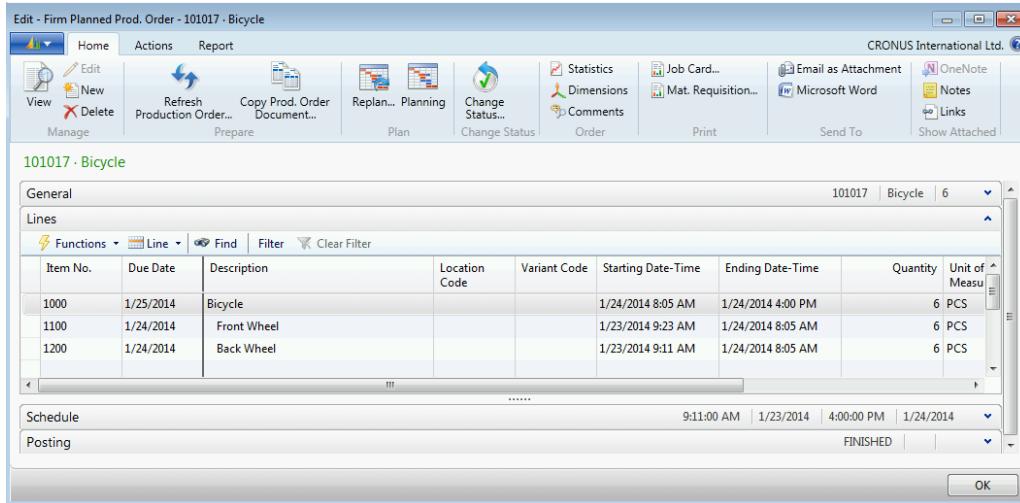
#### Demonstration Steps

1. Change the manufacturing policy for items 1000, 1100, and 1200 to Make-to-Order.
  - a. In the **Search** box, type “items”, and then select the related link.
  - b. On the **Items** list page, double-click the line for item 1000.
  - c. On the item card, expand the **Replenishment** FastTab.

## Manufacturing in Microsoft Dynamics® NAV 2013

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- d. In the **Manufacturing Policy** field, select Make-to-Order.
  - e. Click **OK** to close the item card.
  - f. Repeat steps b to e for items 1100 and 1200.
2. Create a sales order for item 1000 for delivery on January 25, 2014.
    - a. In the **Search** box, type "sales orders", and then select the related link.
    - b. On the **Home** tab of the **Sales Orders** list page, click **New**, and then press **Enter**.
    - c. On the **General** FastTab of the sales order card, in the **Sell-to Customer No.** field, type "20000". Accept any messages.
    - d. Set the **Requested Delivery Date** field to January 25, 2014.
    - e. On the **Lines** FastTab, in the **Type** field, select Item.
    - f. In the **No.** field, type "1000".
    - g. In the **Quantity** field, type "6". Accept any messages.
  3. Create a production order from the sales order.
    - a. On the **Actions** tab of the sales order, click **Planning**.
    - b. On the **Home** tab of the **Sales Order Planning** page, click **Create Prod. Order**.
    - c. On the request message, accept all defaults, and then click **Yes** to create the production order.
    - d. Click **OK** to close the confirmation message.
    - e. Click **Close** to close the **Sales Order Planning** page.
  4. Review the production order.
    - a. On the **Lines** FastTab of the sales order card, click **Functions**, and then click **Order Tracking**.
    - b. On the **Home** tab of the **Order Tracking** page, click **Show**. This displays the production order that you created in step 3. Notice that there are three order lines on the **Lines** FastTab, one each for items 1000, 1100, and 1200.



**FIGURE 11.11: MULTILINE PRODUCTION ORDER**

- Press **Esc** three times to close all open pages.

## Other Planning Worksheet Features

The planning worksheet offers the following additional features:

- Planning worksheet filters
- The ability to change the replenishment system for individual planning lines
- The ability to refresh planning lines

### Planning Worksheet Filters

In the lessons to this point, you have used the **No.** filter field on the **Item** FastTab of the **Calculate Plan – Plan. Wksh.** request page to limit the planning worksheet calculations to a specific item or set of items. You can filter on any field on the item card, and on several other predefined filter fields.

For example, to separate the planning for different types of supply orders, you can filter planning calculations based on the item card's **Replenishment System** field. If your company has a combination of make-to-order (MTO) and make-to-stock (MTS) items, you can separate your planning for these two groups by filtering on the item card's **Manufacturing Policy** field. If you want to work only with items at the BLUE location, you can set a filter on the **Location Filter** field on the **Item** FastTab of the **Calculate Plan – Plan. Wksh.** request page.

## Demonstration: Use Filters in Planning Calculations

**Scenario:** Eduardo, the production planner at CRONUS, wants to run a full regenerative plan for both MPS and MRP. Because he is concerned about the number of items that could be planned, he decides to use filters to break the items into groups.

### Demonstration Steps

1. Run the regenerative plan for MTO items only.
  - a. In the **Search** box, type “planning worksheets”, and then select the link for Planning Worksheets – Departments/Manufacturing/Planning.
  - b. Delete all existing planning lines from the worksheet.
  - c. On the **Home** tab of the planning worksheet, click **Calculate Regenerative Plan**.
  - d. On the **Options** FastTab of the **Calculate Plan – Plan. Wksh.** request page, select the check box for both the **MPS** and **MRP** fields.
  - e. Set the **Starting Date** field to January 01, 2014.
  - f. Set the **Ending Date** field to January 25, 2014.
  - g. In the **Use Forecast** field, select 2014.
  - h. On the **Item** FastTab, in the **No.** filter field, delete the existing value.
  - i. Click the drop-down arrow in the **Search Description** field, and change this field instead to the **Manufacturing Policy** field.
  - j. In the **Manufacturing Policy** filter field, select Make-to-Order.
  - k. Leave all other fields as they are, and then click **OK** to calculate the plan. Notice that the planning system creates four planning lines. If you check the manufacturing policy for the items on all four lines, you will find that they are all MTO.
2. Rerun a regenerative plan for MTS items only.
  - a. Delete all existing planning lines from the worksheet.
  - b. On the **Home** tab, click **Calculate Regenerative Plan**.
  - c. On the **Options** FastTab of the **Calculate Plan – Plan. Wksh.** request page, select the check box for the **MPS** field, and clear the check box for the **MRP** field.
  - d. In the **Use Forecast** field, delete the existing value.
  - e. On the **Item** FastTab, in the **Manufacturing Policy** filter field, select Make-to-Stock.
  - f. Click **OK** to calculate the plan. Notice that the planning system now creates many more planning lines, and that they are all for MTS items.

## Module 11: Additional Planning Topics

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3. Rerun a regenerative plan for MTS items, but add a location filter.
  - a. Delete all existing planning lines from the worksheet.
  - b. On the **Home** tab, click **Calculate Regenerative Plan**.
  - c. On the **Options** FastTab of the **Calculate Plan – Plan. Wksh.** request page, select the check box for the **MPS** field, and clear the check box for the **MRP** field.
  - d. In the **Use Forecast** field, delete the existing value.
  - e. On the **Item** FastTab, on the Limit totals to section, set the **Location Filter** field to **SILVER**.
  - f. Click **OK** to calculate the plan. Notice that the planning system now creates planning lines only for MTS items at the **SILVER** location.
  - g. Click **OK** to close the planning worksheet.

### Change Replenishment System

The planning worksheet lets you change the replenishment system on individual planning lines from Prod. Order to Purchase. You do this by changing the value in the **Replenishment System** field on the planning line. When you carry out the associated action message, the program respects the replenishment system that is specified on the planning line.

You can use this functionality for items that you typically manufacture, but that you want to subcontract because of capacity constraints or machine downtime.

### Refresh Planning Lines

To update the components and routings for existing planning lines in the planning worksheet, you can use the **Refresh Planning Line** function on the worksheet's **Home** tab. This function deletes the existing component and routing lines for the affected planning lines, and then generates new component and routing lines based on standard data.

You can use this function if you make small changes to existing planning lines, or to the BOMs or routings for the items that are specified on those lines, and you want to update the component and routing lines. This function works similar to the **Refresh** function on production orders.

## Planning Reports

The following reports are useful for planning:

- Planning Availability
- Production Forecast

Both reports are described in the "Production Forecast Reports" lesson of the "Forecasting and Planning" training material.

## Lab: Plan for an Item Variant and Location SKU

### Scenario

**Scenario:** You are the production planner at CRONUS. Your company decides to create two new SKUs for the 25-inch variant of item 1000, Bicycle. One is at the BLUE location and one is at the RED location. Shortly after you create the new SKUs, Susan, the order processor at CRONUS, creates a sales order for customer 10000, The Cannon Group PLC. The order is for seven units of the 25-inch variant of item 1000 at the BLUE location, and nine units of the same item variant at the RED location. You must plan supply for these two orders by using the planning worksheet.

### High Level Steps

1. Create SKUs for the 25-inch variant of item 1000 at both the BLUE and RED locations.
2. Create the sales order with two sales lines, one for each SKU that you created in step 1.
3. RUN the planning worksheet for item 1000, but only for the 25-inch variant at the BLUE and RED locations.

### Detailed Steps

1. Create SKUs for the 25-inch variant of item 1000 at both the BLUE and RED locations.
  - a. In the **Search** box, type "items", and then select the related link.
  - b. On the **Items** list page, double-click the line for item 1000, Bicycle.
  - c. On the **Actions** tab of the item card, click **Create Stockkeeping Unit**.
  - d. On the **Options** FastTab of the **Create Stockkeeping Unit** page, in the **Create Per** field, select Location & Variant.
  - e. On the **Item** FastTab, on the Limit totals to section, in the **Location Filter** field, type "BLUE|RED".
  - f. In the **Variant Filter** field, select 25 for the 25-inch variant of item 1000.
  - g. Click **OK** to create the stockkeeping units.
  - h. When the batch job finishes, it returns you to the item card. Click **OK** to close the item card.

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2. Create the sales order with two sales lines, one for each SKU that you created in step 1.
  - a. In the **Search** box, type "sales orders", and then select the related link.
  - b. On the **Home** tab of the **Sales Orders** list page, click **New**, and then press **Enter**.
  - c. On the **General** FastTab of the sales order card, in the **Sell-to Customer No.** field, type "10000".
  - d. Set the **Requested Delivery Date** field to February 15, 2014.
  - e. On the **Lines** FastTab, in the **Type** field, select Item.
  - f. In the **No.** field, type "1000". Notice that the **Location Field** automatically changes to BLUE.
  - g. In the **Variant Code** field, select 25.
  - h. In the **Quantity** field, type "7". Accept any messages.
  - i. On the second line in the **Lines** FastTab, in the **Type** field, select Item.
  - j. In the **No.** field, type "1000".
  - k. In the **Variant Code** field, select 25.
  - l. In the **Location Code** field, select RED.
  - m. In the **Quantity** field, type "9". Accept any messages.
  - n. Click **OK** to close the sales order card.
3. RUN the planning worksheet for item 1000, but only for the 25-inch variant at the BLUE and RED locations.
  - a. In the **Search** box, type "planning worksheets", and then select the link for Planning Worksheets – Departments/Manufacturing/Planning.
  - b. Delete all existing planning lines from the worksheet.
  - c. On the **Home** tab of the planning worksheet, click **Calculate Regenerative Plan**.
  - d. On the **Options** FastTab of the **Calculate Plan – Plan. Wksh.** request page, select the check box for **MPS** and clear the check box for **MRP**.
  - e. Set the **Starting Date** field to February 01, 2014.
  - f. Set the **Ending Date** field to February 28, 2014.
  - g. In the **Use Forecast** field, delete the existing value.
  - h. On the **Item** FastTab, in the **No.** filter field, type "1000".

## Module 11: Additional Planning Topics

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- i. Clear all other filter fields in the Show results section.
- j. In the Limit totals to section, in the **Location Filter** field, type "BLUE|RED".
- k. Click the green plus sign under the location filter line. This adds another filter line.
- l. Click the drop-down arrow on the second filter line in the Limit totals to section, and select Variant Filter.
- m. In the **Variant Filter** field, select 25.
- n. Click **OK** to calculate the plan. Notice that the planning system suggests only two production orders, both to supply the sales order that you created for the two new SKUs.
- o. Click **OK** to close the planning worksheet.

## Module Review

The planning features in Microsoft Dynamics NAV are powerful and flexible. Although you should master the program's main planning functions, it is frequently the additional features that are the greatest timesavers, or that offer the best solutions to nonstandard challenges.

In a large, multi-site environment, you can use stockkeeping units to automate tasks that are otherwise time-consuming and error-prone.

## Test Your Knowledge

Test your knowledge with the following questions.

1. What are item variants?

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2. What is a stockkeeping unit?

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3. What does the Planning Flexibility field do?

- ( ) It specifies the maximum percentage of change the planning system can apply to a supply order.
- ( ) It specifies a date formula for the maximum date change the planning system can apply to a supply order.
- ( ) It determines whether the planning system can change the replenishment system for a supply order.
- ( ) It determines whether the planning system calculates action messages for the supply order.

## Module 11: Additional Planning Topics

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4. If you want to change a supply order from a production order to a purchase order on the planning worksheet, what field do you use?

- Order Type
- Order Policy
- Replenishment System
- Manufacturing Policy

5. What field do you change on the item card if you want to combine parent items and components on the same production order?

- Multilevel Orders
- Multiline Orders
- Combine Order Types
- Manufacturing Policy

## Test Your Knowledge Solutions

### Test Your Knowledge

1. What are item variants?

MODEL ANSWER:

Item variants refer to item characteristics such as size, color, and so on. Item variants let you accommodate different versions of items without having to create a new item for each version.

2. What is a stockkeeping unit?

MODEL ANSWER:

A stockkeeping unit (SKU) is an extension of an item card. A SKU states the inventory and planning parameters for items and their variants for each location.

3. What does the Planning Flexibility field do?

- ( ) It specifies the maximum percentage of change the planning system can apply to a supply order.
- ( ) It specifies a date formula for the maximum date change the planning system can apply to a supply order.
- ( ) It determines whether the planning system can change the replenishment system for a supply order.
- (✓) It determines whether the planning system calculates action messages for the supply order.

4. If you want to change a supply order from a production order to a purchase order on the planning worksheet, what field do you use?

- ( ) Order Type
- ( ) Order Policy
- (✓) Replenishment System
- ( ) Manufacturing Policy

## Module 11: Additional Planning Topics

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5. What field do you change on the item card if you want to combine parent items and components on the same production order?

- Multilevel Orders
- Multiline Orders
- Combine Order Types
- Manufacturing Policy

