

MODULE 14: SHOP LOADING

Module Overview

When you create work centers and machine centers in Microsoft Dynamics® NAV, you define a company's manufacturing *capacity*. Suppose that a company has a machine center that performs the final assembly of products. If that machine center operates five days a week for 10 hours a day at 100% efficiency, then the company has a capacity of 50 hours a week for final assembly.

When you plan or schedule a production order for manufacturing, you create *demand* for the work centers and machine centers that are required to process that production order. For example, if you release a production order that requires 30 hours of final assembly work, that production order represents 30 hours of demand for the machine center that performs the final assembly task.

When you compare demand to capacity for a work center or machine center, you measure the *load* for that production facility. For example, when you schedule 30 hours of work in a week for a machine center that has a capacity of 50 hours, that machine center has a load of 60% for that week.

Typically, production planners are concerned about the following two situations regarding load:

- If the demand for a facility exceeds that facility's capacity in a period, this creates an overload situation. This means that the facility cannot finish all the work that you assigned to it for the period in question. This can result in scheduling and delivery problems.
- If the load that is put on a facility is too low in a period, this means that you are underutilizing the facility. This can leave machinery and people idle, and significantly reduce productivity.

Microsoft Dynamics NAV offers the following two approaches to monitor and manage load:

- **Infinite capacity loading** – In this approach, the program's planning system schedules work at a production facility regardless of the load that is put on that facility. For example, if you schedule 100 hours of work for one week at a machine center with a weekly capacity of 50 hours, the planning engine still assigns the work even though the machine center cannot finish it in time. Therefore, the production planner must monitor the load and make the necessary adjustments to the schedule.

- **Finite capacity loading** – In this approach, the planning system schedules work at a production facility only up to a certain percentage of the facility's capacity. For example, you can set a limit of 90 percent load for a facility. If you then try to schedule a higher load for the facility, the planning engine pushes the excess work to the closest available period within the work's due date.

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:

- Describe the basic tools that are used to manage shop loading.
- Explain how to manage shop loading by assuming infinite capacity.
- Show how to manage shop loading by using finite capacity.
- Review the reports that are related to shop loading.

Shop Loading Basic Tools

The program offers the following basic tools to help you view and manage shop load:

- Task lists
- Load pages

Task Lists

You can schedule production orders by using one of the following methods:

- Generate a production order from a sales order.
- Create a production order manually.
- Run the refresh or replan functions for a production order.
- Run MPS or MRP.

When you schedule a production order, the program records the tasks for the work center or machine center that are specified in the production order routing. The program does not remove these tasks until the production order is finished.

The program displays the tasks for a specific work center or machine center in a task list. A task list resembles a dispatch list, except that it does not net the time remaining on released production orders in progress. A task list includes the following information:

- Operations for all production orders that are scheduled for the work center or machine center, and not just operations that are scheduled for released orders
- Operation numbers, production order numbers, and the production order status for each operation
- The original gross time that is required for each operation
- The starting and ending date/times for each operation

To view the **Work Center Task List** page, follow these steps.

1. In the **Search** box, type "work centers", and then select the related link.
2. On the **Work Centers** list page, select the line for work center 100, Assembly department.
3. On the **Home** tab, click **Task List**.

Status	Prod. Order No.	Operation No.	Description	Setup Time	Run Time	Wait Time	Move Time	Starting Time	Starting Date	Ending Time	Ending Date	Concurrent Capacities
Firm Planned	101004	10	Wheel assembly	110	12	0	0	2:48:00.013 PM	1/14/2014	8:38:00.013 A...	1/22/2014	1
Firm Planned	101001	10	Wheel assembly	110	12	0	0	10:05:00 AM	1/22/2014	9:55:00 AM	1/23/2014	1
Released	101008	10	Rim assembly	60	5	0	0	2:05:00 PM	1/22/2014	4:00:00 PM	1/22/2014	1
Released	101008	10	Rim assembly	60	5	0	0	2:05:00 PM	1/22/2014	4:00:00 PM	1/22/2014	1
Firm Planned	101017	10	Rim assembly	60	5	0	0	9:23:00 AM	1/23/2014	10:53:00 AM	1/23/2014	1
Firm Planned	101017	10	Rim assembly	60	5	0	0	9:11:00 AM	1/23/2014	10:41:00 AM	1/23/2014	1
Released	101008	10	Wheel assembly	110	12	0	0	2:55:59.987 PM	1/23/2014	10:57:59.987 ...	1/24/2014	1
Firm Planned	101017	10	Wheel assembly	110	12	0	0	8:05:00 AM	1/24/2014	11:07:00 AM	1/24/2014	1
Firm Planned	1010005	10	Wheel assembly	110	12	0	0	10:04:00.007 A...	1/27/2014	3:06:00.007 P...	1/27/2014	1
Released	1011003	10	Wheel assembly	110	12	0	0	2:55:00 PM	1/28/2014	11:57:00 AM	1/29/2014	1
Released	1011004	10	Wheel assembly	110	12	0	0	12:25:00 PM	1/29/2014	8:15:00 AM	1/30/2014	1

FIGURE 14.1:WORK CENTER TASK LIST PAGE

4. Click **OK** to close the page.



Note: You can also access the task list for a work center from the work center card.



Note: The functionality for a machine center task list is identical to that of a work center task list. You can access a machine center task list from either the **Machine Centers** list page or the machine center card.

Load Pages

A work center or machine center derives its capacity from its capacity calendar entries. When you schedule production order operations at a work center or machine center, you create *demand* for that facility. The program calculates the load for a facility by dividing its demand by its capacity for a specific period.

You can view the load for a work center in the **Work Center Load** page. This page displays the load both for the work center and the machine centers that are assigned to the work center. You can view the load for a machine center in the **Machine Center Load** page. This page displays the load for only the machine center. Unlike the task lists, the load pages reflect the time that is remaining on released production orders.

To view the **Work Center Load** page, follow these steps.

1. In the **Search** box, type “work centers”, and then select the related link.

2. On the **Work Centers** list page, select the line for work center 100, Assembly department.
3. On the **Home** tab, click **Load**.

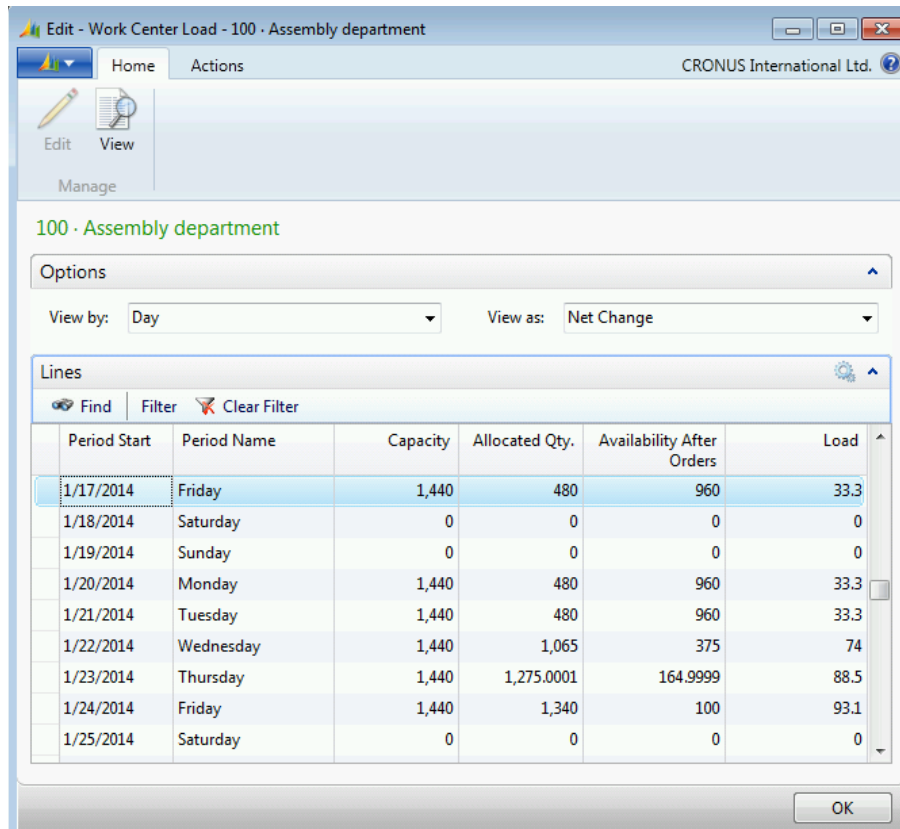



FIGURE 14.2:WORK CENTER LOAD PAGE

The following table describes the fields on this page.

Field	Description
Period Start	The start of the period to which the data on the line applies. The period lasts until the start date of the next period. The dates that are displayed here are determined by the time interval that you select in the View by field on the Options FastTab. For example, if you select Week, the period start dates are seven days apart.
Period Name	The name of the period. For a time interval of day, this is the day of the week. For a time interval of week, it is the week number, and so on.

Field	Description
<p>Capacity</p>	<p>The amount of work that the work center can perform in the specified period. The program calculates the capacity based on the following:</p> <ul style="list-style-type: none"> • The shop calendar that is used by the work center • The capacity and efficiency values that are defined in the Scheduling FastTab of the work center card. <p>If the work center uses a consolidated calendar, the program calculates the capacity based on the following:</p> <ul style="list-style-type: none"> • The shop calendars for the machine centers that are assigned to the work center. • For the machine centers that are assigned to the work center, the capacity and efficiency values that are defined in the Scheduling FastTab of each machine center card. <p>You can drill down to the detailed calendar entries for the work center by clicking the value in the Capacity field.</p>
<p>Allocated Qty.</p>	<p>The capacity that is required to produce the desired output at the work center in the specified period. This represents the requirements of all production order operations that are scheduled for the work center except for operations on simulated production orders. It also includes the allocated capacity for any machine centers that are assigned to the work center regardless of whether the work center uses a consolidated calendar.</p> <p>You can drill down to the detailed capacity requirements for the work center by clicking the value in the Allocated Qty. field. This opens the Prod. Order Capacity Need page. This page shows the detailed capacity requirement entries for the work center and any machine centers that are assigned to the work center.</p> <hr/> <p> Note: An operation can appear on the task list without any allocated time on the load page. This means that the operation finished at an earlier time.</p> <hr/>

Field	Description
Availability After Orders	The net amount of capacity that is available for the work center after you subtract its allocated capacity from its overall capacity for the specified period. If this value is negative, then there is more work scheduled at the work center than its capacity.
Load	The percentage of the work center's capacity that is used by the allocated capacity for the specified period. For example, if a work center has a capacity of 100 minutes in a day, and you allocate 73 minutes of work to it for that day, its load is 73 percent.

You can change the date interval for the **Work Center Load** page by changing the value in the **View by** field on the **Options** FastTab. The following intervals are available:

- Day
- Week
- Month
- Quarter
- Year
- Period

You can view the load data as Net Change or Balance at Date by changing the value in the **View as** field on the **Options** FastTab. *Net Change* calculates each period on its own. *Balance at Date* calculates a cumulative total where the program adds the values for the current period to the sum of the values in all previous periods. The Balance at Date view helps you assess the balance between capacity and workload over a longer period. For example, you can determine whether you are operating at only 54 percent of capacity for the whole year regardless of monthly or weekly fluctuations.



Note: The functionality for the **Machine Center Load** page is identical to that of the **Work Center Load** page. The difference is that the **Machine Center Load** page displays data only for one machine center. By comparison, the **Work Center Load** page displays data for a work center and any machine centers that are assigned to it. You can access the **Machine Center Load** page from either the **Machine Centers** list page or the machine center card.

Infinite Capacity Planning

Unless you identify a work center or machine center as a constrained resource, Microsoft Dynamics NAV assumes infinite capacity when it schedules production order operations. This means that you or the planning system can schedule more work for a facility than it can process for a period. This poses a potential problem because it means that scheduling calculations might be incorrect. For example, if you schedule 50 hours of work for work center A on January 23, 2014, and that work center only produces 24 hours of work a day, the additional 26 hours must be processed on another day.

One solution to this problem is to designate work center A as a constrained resource. Then you can use finite capacity planning to manage load and scheduling issues. The “Finite Capacity Planning” lesson describes this approach. If you do not use finite capacity planning, it is your responsibility as the production planner or shop floor scheduler to monitor the load for key facilities and adjust your production schedule accordingly.

Companies also try to avoid scheduling insufficient work for a facility for a period. Regardless of whether you use finite capacity planning, it is your responsibility to monitor the load for this situation and to adjust your production schedule accordingly.



Note: This lesson uses a machine center for all its demonstrations. The same tools and techniques apply to work centers.

Demonstration: Detect an Underutilized Machine Center

Scenario: Eduardo, the production planner at CRONUS International Ltd., must schedule sufficient work for machine center 110 to keep it busy at least 80 percent of the time. To meet this goal, he monitors the workload for the machine center by using the **Machine Center Load** page. Currently, he is planning for the work week of February 3, 2014 to February 7, 2014.

Demonstration Steps

1. Check the workload for machine center 110 for February 3, 2014 to February 7, 2014.
 - a. Close all open pages.
 - b. In the **Search** box, type “machine centers”, and then select the related link.
 - c. On the **Machine Centers** list page, select the line for machine center 110.
 - d. On the **Home** tab, click **Load**.

- e. On the **Options** FastTab of the **Machine Center Load** page, in the **View by** field, select Day.
- f. In the **View as** field, select Net Change.
- g. On the **Lines** FastTab, scroll down until the lines for February 3, 2014 to February 7, 2014 are visible. Notice that there is no work scheduled for machine center 110 for the whole work week.

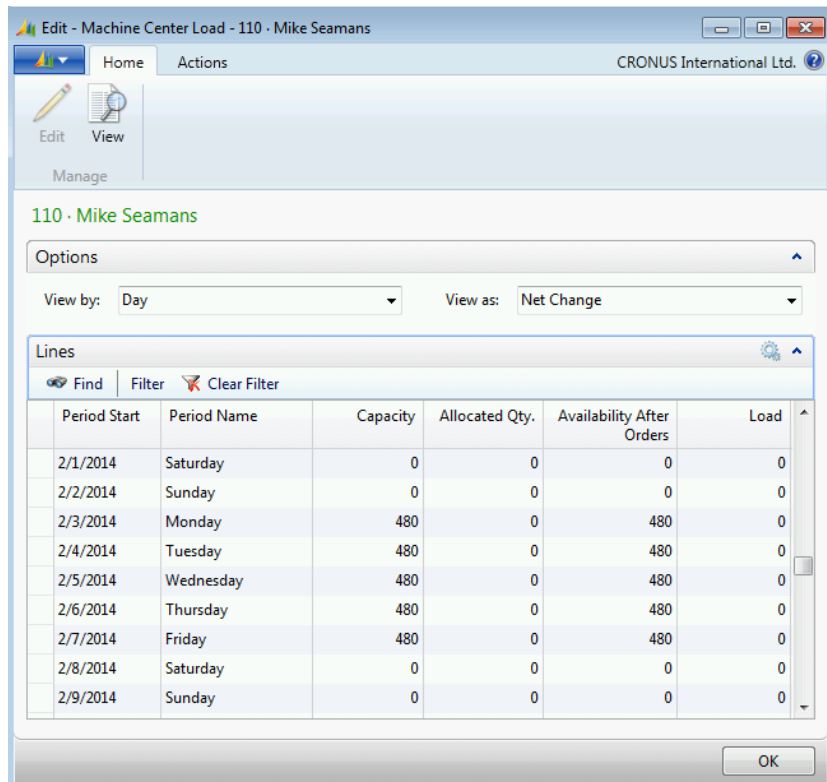


FIGURE 14.3: MACHINE CENTER LOAD PAGE FOR UNDERUTILIZED MACHINE CENTER

- h. Click **OK** to close the **Machine Center Load** page.

Demonstration: Detect an Overloaded Machine Center

This is a continuation of the “Detect an Underutilized Machine Center” demonstration.

Scenario: Eduardo, the production planner at CRONUS, has sufficient overall demand to schedule new work for machine center 110. After checking routings, he knows that each unit of item 1100, Front Wheel, requires 10 minutes of run time on machine center 110. Machine center 110 has a capacity of 480 minutes per day. Eduardo has two production orders that he can create for item 1100, one of 40 items, and one of 50 items. He creates both production orders with a due date of February 8, 2014. He then rechecks the load on machine center 110 for the week of February 3, 2014 to February 7, 2014.

Demonstration Steps

1. Change the flushing method for item 1120, Spokes, to Manual.
 - 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 1120, Spokes, to open the item card.
 - c. Expand the **Replenishment** FastTab.
 - d. In the **Flushing Method** field, select Manual.
 - e. Click **OK** to close the item card.



Note: Item 1120, Spokes, is a component on the production BOM for item 1100. When item 1120's flushing method is set to Forward, the item is automatically flushed the moment that a production order for item 1100 is released.

The forward flushing of components creates ledger entries. These ledger entries prevent you from refreshing a production order. You are taking this action only to simplify this demonstration.

2. Create two production orders for item 1100, both with a due date of February 8, 2014.
 - a. In the **Search** box, type "released prod. orders", and then select the related link.
 - b. On the **Home** tab of the **Released Prod. Orders** list page, click **New**, and then press **Enter**.
 - c. On **General** FastTab of the production order card, in the **Source No.** field, select 1100, Front Wheel.
 - d. In the **Quantity** field, type "40".
 - e. Set the **Due Date** field to February 8, 2014.
 - f. On the **Home** tab, click **Refresh Production Order**.
 - g. On the **Refresh Production Order** request page, accept all defaults, and then click **OK** to start the batch job.
 - h. Click **OK** to close the production order card.
 - i. Repeat steps b to h to create a second production order for 50 units of item 1100.
3. Check the workload for machine center 110 for February 3, 2014 to February 7, 2014.
 - a. In the **Search** box, type "machine centers", and then select the related link.
 - b. On the **Machine Centers** list page, select the line for machine center 110.
 - c. On the **Home** tab, click **Load**.

- d. On the **Lines** FastTab of the **Machine Center Load** page, scroll down until the rows from February 3, 2014 to February 7, 2014 are visible. Notice that you now have too much work scheduled for Friday, February 7, 2014. This results in a load of 189.6 percent.

Period Start	Period Name	Capacity	Allocated Qty.	Availability After Orders	Load
2/1/2014	Saturday	0	0	0	0
2/2/2014	Sunday	0	0	0	0
2/3/2014	Monday	480	0	480	0
2/4/2014	Tuesday	480	0	480	0
2/5/2014	Wednesday	480	0	480	0
2/6/2014	Thursday	480	50	430	10.4
2/7/2014	Friday	480	910	-430	189.6
2/8/2014	Saturday	0	0	0	0
2/9/2014	Sunday	0	0	0	0

FIGURE 14.4: MACHINE CENTER LOAD PAGE FOR OVERLOADED MACHINE CENTER

- e. Leave the **Machine Center Load** page open.

Demonstration: Reschedule a Production Order

This is a continuation of the “Detect an Overloaded Machine Center” demonstration.

Scenario: Eduardo, the production planner at CRONUS, decides to distribute the workload for machine center 110 more evenly during the week of February 3, 2014 to February 7, 2014.

Demonstration Steps

1. Reschedule the due date for the production order for 50 units of item 1100, Front Wheel, from February 8, 2014 to February 7, 2014.
 - a. On the **Lines** FastTab of the **Machine Center Load** page, on the line for Friday, February 7, 2014, drill down into the value in the **Allocated Qty.** field. This opens the **Prod. Order Capacity Need** page.
 - b. On the **Prod. Order Capacity Need** page, use the **Choose Columns** function to add the **Prod. Order No.** field. Position it after the **Allocated Time** field. You have to close and reopen the page for these changes to take effect.
 - c. On the **Prod. Order Capacity Need** page, on the line that has 480 in the **Allocated Time** field, drill down into the value in the **Prod. Order No.** field, and then click **Advanced**.
 - d. On the **Navigate** tab of the **Production Order List** page, click **Card**.
 - e. On the **General** FastTab of the production order card, set the **Due Date** field to February 7, 2014.
 - f. On the **Home** tab, click **Refresh Production Order**.
 - g. On the **Refresh Production Order** request page, accept all defaults, and then click **OK** to start the batch job.
 - h. Press **Esc** three times to return to the **Machine Center Load** page.

2. Refresh the workload for machine center 110 for February 3, 2014 to February 7, 2014.
 - a. On the **Actions** FastTab of the **Machine Center Load** page, click **Refresh**. After the page refreshes, notice that the load is now distributed between February 06, 2014 and February 07, 2014, instead of overloading February 07, 2014.

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Options

View by: Day View as: Net Change

Lines

Period Start	Period Name	Capacity	Allocated Qty.	Availability After Orders	Load
2/2/2014	Sunday	0	0	0	0
2/3/2014	Monday	480	0	480	0
2/4/2014	Tuesday	480	0	480	0
2/5/2014	Wednesday	480	50	430	10.4
2/6/2014	Thursday	480	480	0	100
2/7/2014	Friday	480	430	50	89.6
2/8/2014	Saturday	0	0	0	0
2/9/2014	Sunday	0	0	0	0
2/10/2014	Monday	480	0	480	0

FIGURE 14.5: MACHINE CENTER LOAD PAGE WITH REDISTRIBUTED LOAD

- b. Leave the **Machine Center Load** page open.

Demonstration: Move an Operation to Another Machine Center

This is a continuation of the “Reschedule a Production Order” demonstration.

In addition to rescheduling production orders, you can also redistribute workload by moving operations from one facility to another. For example, suppose that you have two machine centers that can perform the same task. If machine center A is overloaded, and machine center B has excess capacity, you can move production order operations from machine center A to machine center B.

Scenario: Eduardo, the production planner for CRONUS, moves an operation from machine center 110 to machine center 120.

Demonstration Steps

1. Move an operation from machine center 110 to machine center 120.
 - a. On the **Lines** FastTab of the **Machine Center Load** page, on the line for Thursday, February 6, 2014, drill down into the value in the **Allocated Qty.** field.
 - b. On the **Prod. Order Capacity Need** page, note the value in the **Prod. Order No.** field.
 - c. Press **Esc** two times to return to the **Machine Centers** list page.
 - d. On the **Home** tab of the **Machine Centers** list page, click **Task List**.
 - e. On the **Machine Center Task List** page, select the line with a value in the **Prod. Order No.** field that matches the production order number that you wrote down in step b. The line should also have a value of 50 in the **Operation No** field, and a value of Released in the **Status** field. Note, there could be other lines with the same production order number and operation number, but that have a different status.
 - f. On the **Home** tab, click **Move**.
 - g. On the **Machine Center List** page, select the line for machine center 120, and then click **OK**. When the program returns you to the **Machine Center Task List** page, notice that the selected operation disappears from the task list.
 - h. Click **OK** to close the **Machine Center Task List** page.
 - i. On the **Machine Centers** list page, select the line machine center 120.
 - j. On the **Home** tab, click **Task List**.
 - k. Locate the operation that you moved from machine center 110. This confirms that the move occurred.
 - l. Click **OK** to close the **Machine Center Task List** page.

Demonstration: Record Production Output

This is a continuation of the “Detect an Overloaded Machine Center” demonstration.

Task lists and workload are not static. They are in a constant state of change because of a combination of new or changed production orders, manufacturing activity, and so on. Microsoft Dynamics NAV reflects these changes by presenting current data. For example, when you record output for a production order operation, you consume workload. The program responds to this activity by reducing the allocated quantity in the affected load pages.

Scenario: Machine center 110 finishes half of its work on the production order for 40 units of item 1100, Front Wheel that you created in the “Detect an Overloaded Machine Center” demonstration. Eduardo, the production planner at CRONUS, records this output, and then checks on the remaining load on machine center 110.

Demonstration Steps

1. Check the current load for machine center 100 for February 7, 2014.
 - a. On the **Machine Centers** list page, select machine center 110.
 - b. On the **Home** tab, click **Load**.
 - c. On the **Lines** FastTab of the **Machine Center Load** page, scroll down until the line for Friday, February 7, 2014 is visible. Notice that the value in the **Capacity** field for that line is 480, and the value in the **Allocated Qty.** field is 430. This results in a load of 89.6 percent.

2. Record production output for a production order.
 - a. On the **Lines** FastTab, on the line for Friday, February 7, 2014, drill down into the value in the **Allocated Qty.** field.
 - b. On the **Prod. Order Capacity Need** page, on the first line, drill down into the value in the **Prod. Order No.** field, and then click **Advanced**.
 - c. On the **Navigate** tab of the **Production Order List** page, click **Card**.
 - d. On the **Home** tab of the production order card, click **Production Journal**.
 - e. On the production journal, select all the lines except the output line that has a value of 50 in the **Operation No.** field.
 - f. On the **Home** tab, click **Delete**.
 - g. On the request message, click **Yes** to confirm the deletion of the selected lines.
 - h. On the line for operation number 50, in the **Setup Time** field, type “30”.
 - i. In the **Run Time** field, type “200”.
 - j. In the **Output Quantity** field, type “20”.

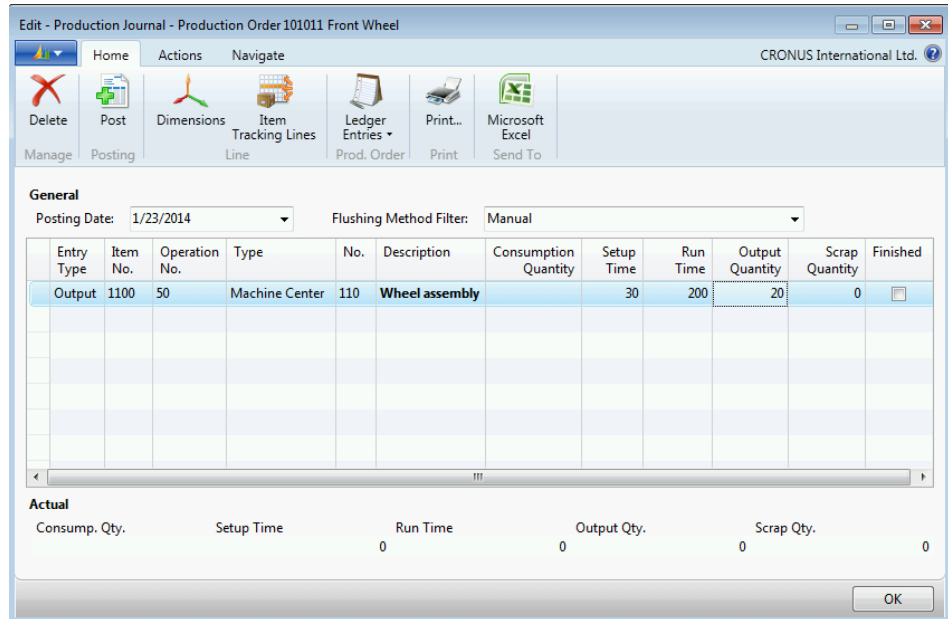


FIGURE 14.6: PRODUCTION JOURNAL ENTRY FOR OPERATION 50

- k. On the **Home** tab, click **Post**.
 - l. On the request message, click **Yes**.
 - m. Click **OK** to close the confirmation message.
3. Check the workload for machine center 110 for February 3, 2014 to February 7, 2014.
 - a. Press **Esc** four times to return to the **Machine Center Load** page.
 - b. On the **Actions** tab, click **Refresh**. Notice that the value in the **Allocated Qty.** field is reduced. Therefore, the value in the **Load** field is also reduced. The program knows that only half the original workload remains for the production order operation that represents the load.

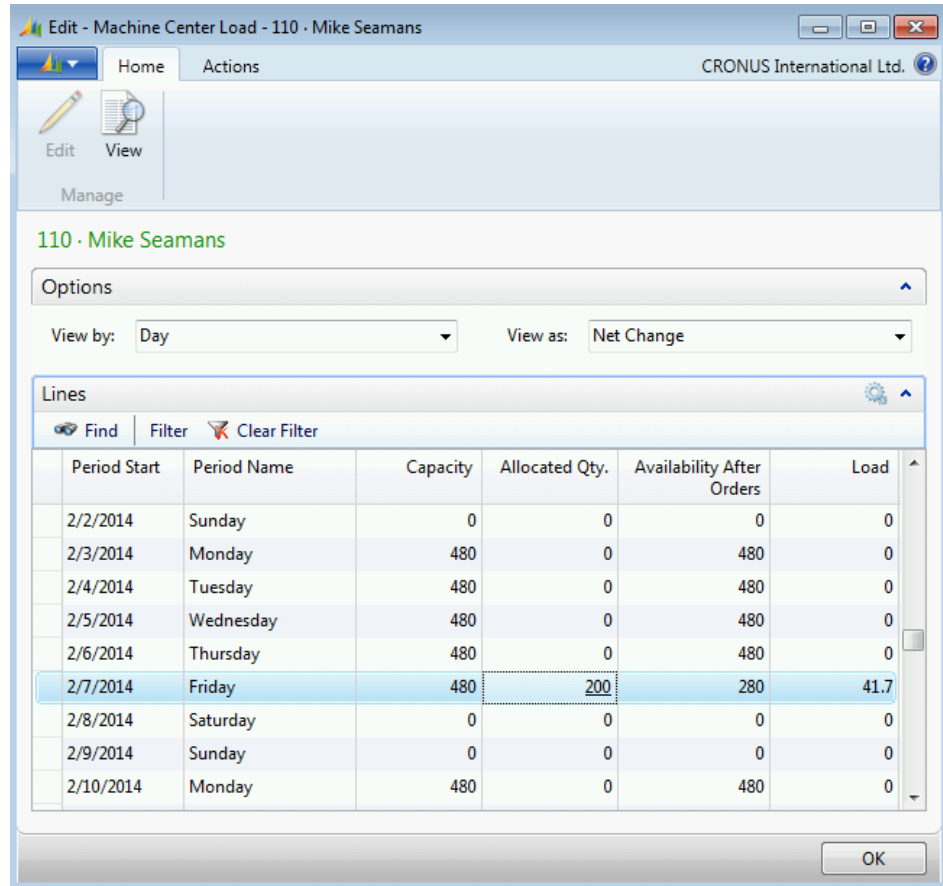


FIGURE 14.7: MACHINE CENTER LOAD AFTER PRODUCTION OUTPUT

c. Click **OK** to close the **Machine Center Load** page.


Finite Capacity Planning

Where you foresee a risk of overloading an important facility, you can identify the facility as a capacity-constrained resource. The planning engine then schedules work for the facility only to a specified load level. This functionality provides the following key benefits:

- It lets you plan operations for capacity-constrained resources in a more detailed and realistic manner.
- It lets you monitor and display the load status of capacity-constrained resources. This provides a clear overview of facilities with limited capacities.



Note: Capacity-constrained resources are known as bottlenecks.

 **Note:** Even if you identify a machine center or work center as a capacity-constrained resource, the program does not take any immediate action for an overload. The finite loading plan only takes effect when the user triggers a change in the plan, for example, by refreshing production orders, accepting action messages in the planning worksheet, and so on.

Capacity Constrained Resources Page

You define capacity-constrained resources in the **Capacity Constrained Resources** page. To view this page, type "capacity constrained resources" in the **Search** box, and then select the related setup link.

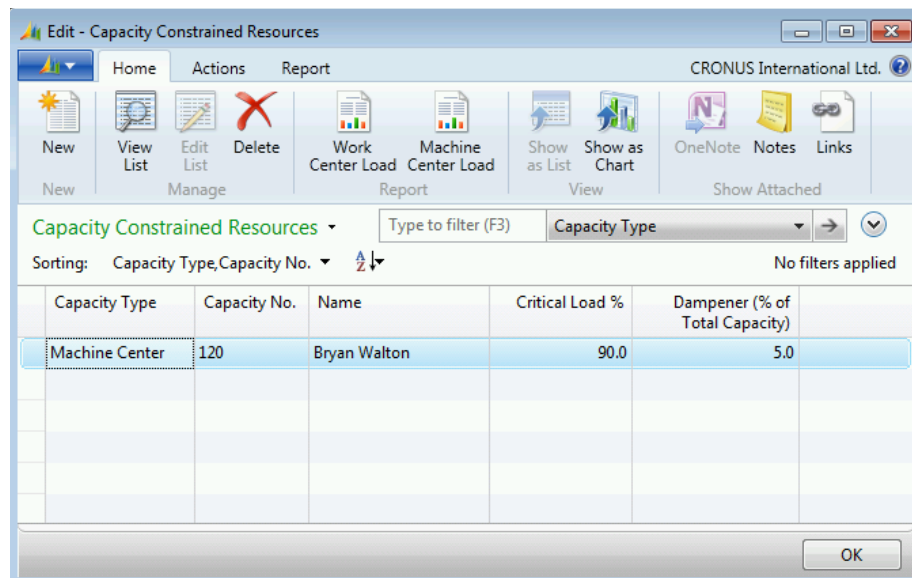



FIGURE 14.8:CAPACITY CONSTRAINED RESOURCES PAGE

The following table describes the fields on this page.

Field	Description
Capacity Type	Specifies the capacity type to which you want to apply finite loading. You can select either Machine Center or Work Center.
Capacity No.	Specifies the number of an existing machine center or work center to which you want to apply finite loading.

Field	Description
Name	Specifies the default name of the machine center or work center. You cannot change this value.
Critical Load %	Specifies the percentage of the available capacity of a machine center or work center for which you can schedule work. For example, if a machine center has a capacity of 20 hours for each day, and you type "90" in this field, you can schedule 18 hours of work for the machine center for the day.
Dampener (% of Total Capacity)	<p>Specifies the tolerance as a percentage of the total capacity of a machine center or work center. This tolerance lets the program schedule the load for a machine center or work center slightly more than the critical load percent. This lets the scheduling routine finish an operation that requires only slightly more capacity, instead of pushing part of the operation to another day.</p> <p>For example, if a machine center has a capacity of 20 hours in a day, and the critical load percent is 90, you can schedule only 18 hours of work for the machine center for the day. If you schedule an operation that requires 19 hours of work, the program pushes part of the operation to another day. However, if you specify a dampener of five percent, this gives the scheduling routine one added hour of flexible capacity for the machine center (five percent of 20). By using this setup, the program can schedule the whole operation of 19 hours on the same day.</p>

 **Note:** Operations on machine centers or work centers that are set up as constrained resources are always planned serially. This means that if a constrained resource has multiple capacities, those facilities are always planned in sequence, not in parallel as they are for a non-constrained resource.

Demonstration: Add a Capacity-Constrained Resource

Scenario: Eduardo, the production planner, at CRONUS, is concerned about the periodical overload of machine center 110. He therefore decides to identify the machine center as a capacity-constrained resource.

Demonstration Steps

1. Identify machine center 110 as a capacity-constrained resource.
 - a. If the **Capacity Constrained Resources** page is already open, skip to step b. Otherwise, in the **Search** box, type "capacity constrained resources", and then select the related setup link.
 - b. On the **Home** tab of the **Capacity Constrained Resources** page, click **New**.
 - c. In the **Capacity Type** field, select **Machine Center**.
 - d. In the **Capacity No.** field, type "110".
 - e. In the **Critical Load %** field, type "90".

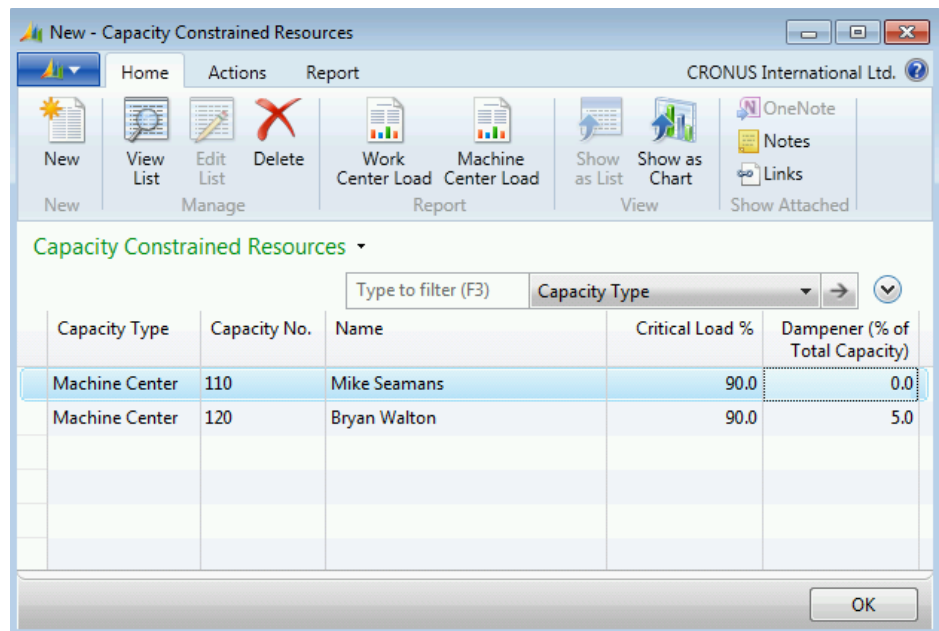


FIGURE 14.9: DEFINITION OF A NEW CAPACITY CONSTRAINED RESOURCE

- f. Click **OK** to close the page.

Demonstration: Schedule with Finite Loading

This is a continuation of the "Add a Capacity-Constrained Resource" demonstration.

Scenario: Eduardo, the production planner at CRONUS, creates two production orders for item 1100, one for 40 units, and the other for 50 units. Both production orders are due on February 6, 2014.



Note: This is the same scenario that you created in the “Detect an Overloaded Machine Center” demonstration in the “Infinite Capacity Planning” lesson. In that lesson, creating the two production orders with the same due date resulted in an overload situation for machine center 110. By using this identical scenario, you can see the effect of finite loading.

Demonstration Steps

1. Create two production orders for item 1100, both with a due date of February 6, 2014.
 - a. In the **Search** box, type “released prod. orders”, and then select the related link.
 - b. On the **Home** tab of the **Released Prod. Orders** list page, click **New**, and then press **Enter**.
 - c. On the **General** FastTab of the production order card, in the **Source No.** field, select 1100, Front Wheel.
 - d. In the **Quantity** field, type “40”.
 - e. Set the **Due Date** field to February 6, 2014.
 - f. On the **Home** tab, click **Refresh Production Order**.
 - g. On the **Refresh Production Order** request page, accept all defaults, and then click **OK** to start the batch job.
 - h. Click **OK** to close the production order card.
 - i. Repeat steps b to h to create a second production order for 50 units of item 1100.

2. Check the workload for machine center 110 for February 3, 2014 to February 7, 2014.
 - a. In the **Search** box, type “machine centers”, and then select the related link.
 - b. On the **Machine Centers** list page, select the line for machine center 110.
 - c. On the **Home** tab, click **Load**.
 - d. On the **Lines** FastTab of the **Machine Center Load** page, scroll down until the rows from February 3, 2014 to February 7, 2014 are visible. Notice that the program schedules the workload from the two production orders for machine center 110 between February 4, 2014 to February 6, 2014, so that no one day has a load greater than 90 percent. This is the result of the finite loading routines.

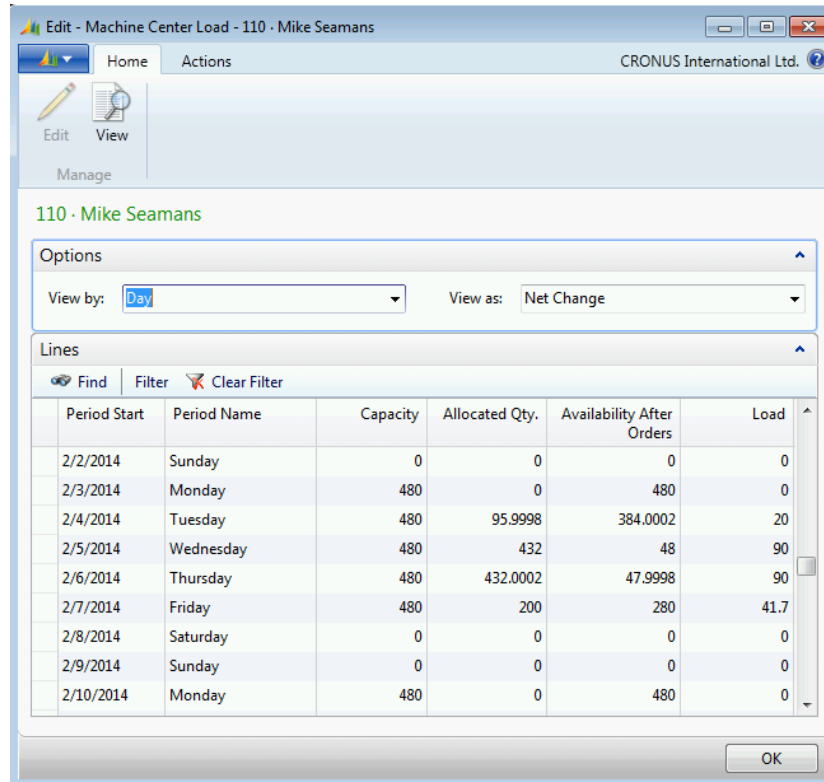


FIGURE 14.10: MACHINE CENTER LOAD WITH FINITE LOADING

e. Click **OK** to close the **Machine Center Load** page.

Reports

Microsoft Dynamics NAV provides the following reports that are related to shop loading.

Report	Description
Capacity Task List	Shows the production orders that are waiting to be processed at the work centers and machine centers. This report includes production order information, input quantity, and starting and ending dates/times for the operations that are scheduled for each work center and machine center. To access this report, type "capacity task list" in the Search box, and then select the related link.

Report	Description
Work Center List	<p>Shows basic information about work centers, such as unit costs, capacity, efficiency, and shop calendar code.</p> <p>To access the report, type “work center list” in the Search box, and then select the related link. You can also access the report from the Home tab or the Report tab of the Work Centers list page.</p>
Work Center Load	<p>Shows the load by work center and period. Also lets you filter on load percentage, in addition to many other criteria, so that you can focus on work centers and periods of interest.</p> <p>To access the report, type “work center load” in the Search box, and then select the related link. You can also access the report from the Home tab or the Report tab of the Work Centers list page.</p>
Work Center Load/Bar	<p>Graphically displays the load by work center and period for those work center and period combinations with actual planning data. Also lets you filter on load percentage, in addition to many other criteria, so that you can focus on work centers and periods of interest.</p> <p>To access the report, type “work center load/bar” in the Search box, and then select the related link. You can also access the report from the Report tab of the Work Centers list page.</p>
Machine Center List	<p>Shows basic information about machine centers, such as machine center number, work center number, efficiency, and capacity.</p> <p>To access the report, type “machine center list” in the Search box, and then select the related link. You can also access the report from the Home tab or the Report tab of the Machine Centers list page.</p>

Report	Description
Machine Center Load	<p>Shows the load by machine center and period. Also lets you filter on load percentage, in addition to many other criteria, so that you can focus on machine centers and periods of interest.</p> <p>To access the report, type "machine center load" in the Search box, and then select the related link. You can also access the report from the Home tab or the Report tab of the Machine Centers list page.</p>
Machine Center Load/Bar	<p>Graphically displays the load by machine center and period for those machine center and period combinations with actual planning data. Also lets you filter on load percentage, in addition to many other criteria, so that you can focus on machine centers and periods of interest.</p> <p>To access the report, type "machine center load/bar" in the Search box, and then select the related link. You can also access the report from the Report tab of the Machine Centers list page.</p>

Module Review

One of the keys to manufacturing success is to match supply and demand in all aspects of a company's operations. This applies to capacity resources just as it applies to raw materials and components.

Although Microsoft Dynamics NAV does not provide full shop scheduling and load-balancing capabilities for capacity, it does provide basic tools that let you manage and monitor load manually.

If you want to manage some of these issues automatically, you can use finite capacity loading.

Test Your Knowledge

Test your knowledge with the following questions.

1. What is a task list?

2. What is the main difference between the Work Center Load page and the Machine Center Load page?

3. What is finite capacity planning?

Test Your Knowledge Solutions

Test Your Knowledge

1. What is a task list?

MODEL ANSWER:

A task list is a page that displays the operations for a specific work center or machine center. A task list resembles a dispatch list, except that it does not net the remaining time on released production orders in progress.

2. What is the main difference between the Work Center Load page and the Machine Center Load page?

MODEL ANSWER:

The Work Center Load page displays the load for both the work center and the machine centers that are assigned to the work center. The Machine Center Load page displays the load for only the machine center.

3. What is finite capacity planning?

MODEL ANSWER:

Finite capacity planning is an approach in which the planning engine schedules work at a production facility only up to a certain percentage of the facility's capacity.