# SPC Made Easy Demonstration

**Welcome** to the SPC Made Easy demonstration. Give us half an hour of your time and we will show you how easy Statistical Process Control can be. This demonstration operates just like the actual software except that some of the features are grayed and the data is fixed, along with the dates.

Text that looks like this: **Click here.**
is asking you to perform an action in the demonstration.

You can follow this document or poke around in the software on your own. Either way, we hope you enjoy it. So…

*Just sit back, relax and join us in the middle of a story…*

Today is the 6th of August 2001 and you are the production manager for Quick Connect Cable Inc. In the last managers' meeting there was concern expressed about an unusual increase in the number of defective materials manufactured last month. You have been asked to explore the problem and report back with your findings. Several people on the assembly lines have also recently complained of problems making error free cables.

As a customer of Cirris Systems, you recently purchased a copy of SPC Made Easy. You are excited to try out this new software and research the recent increase in cable failures on the product line.

## Demo Installation

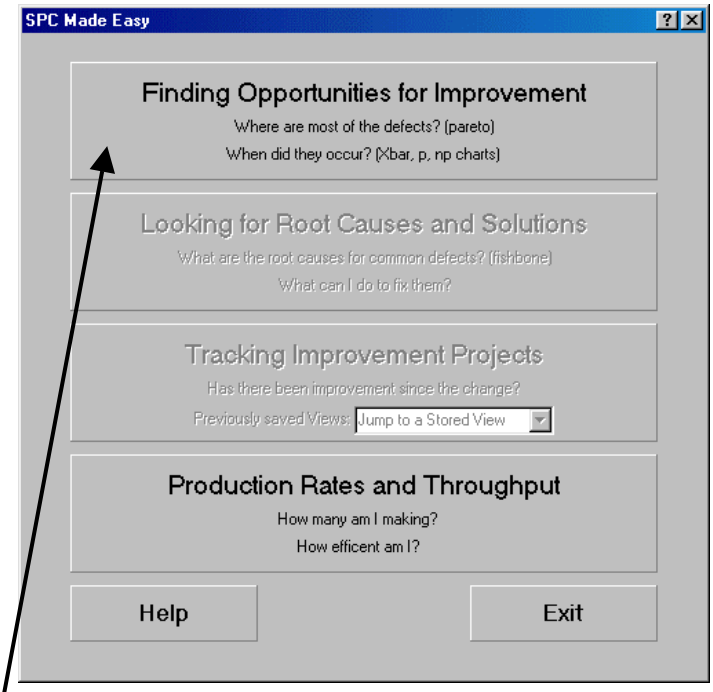
Place the CD in your CD-ROM drive. The installation program should load automatically. If it does not, select SPCDEMOSETUP.EXE on the CD-ROM drive. Follow the on screen prompts to complete the installation

After installing the program, you begin your research by **double clicking on the SPC Made Easy Demo icon** that has been placed on your desktop. Once the database has been initialized, the Main Menu will appear.

# Getting Started looking for defects…

Looking at the menu you see four choices.

- Finding Opportunities for Improvement.
- Looking for Root Causes and Solutions.
- Tracking Improvement Projects.
- Production Rates and Throughput.

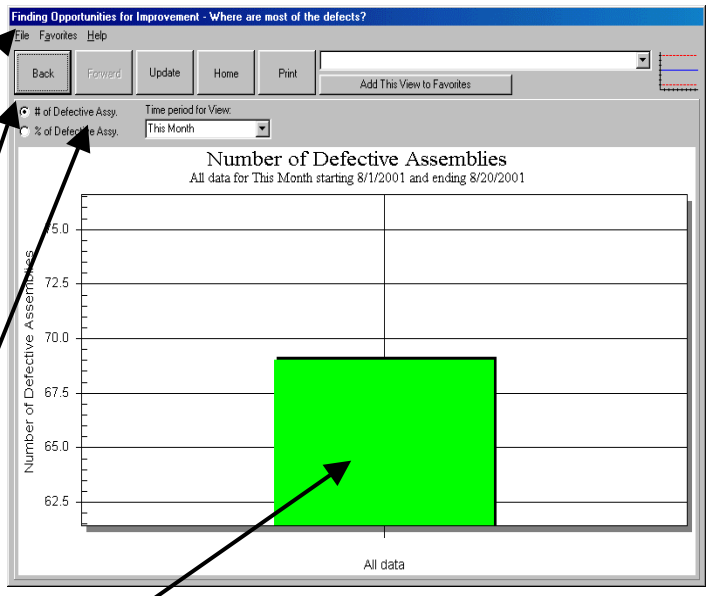



Let's utilize the "Finding Opportunities for Improvement," section. Here you can find answers to two questions that will help in your search.

- Where are most of the defects?
- When did they occur?

**Click this button**.

This brings you to the "Where are most of the defects?" screen. There are now several choices available to you.




The File, Favorites and Help menu items, which are like those found in windows.

The Back, Forward, Update, Home, Print and Add this View to Favorites buttons.

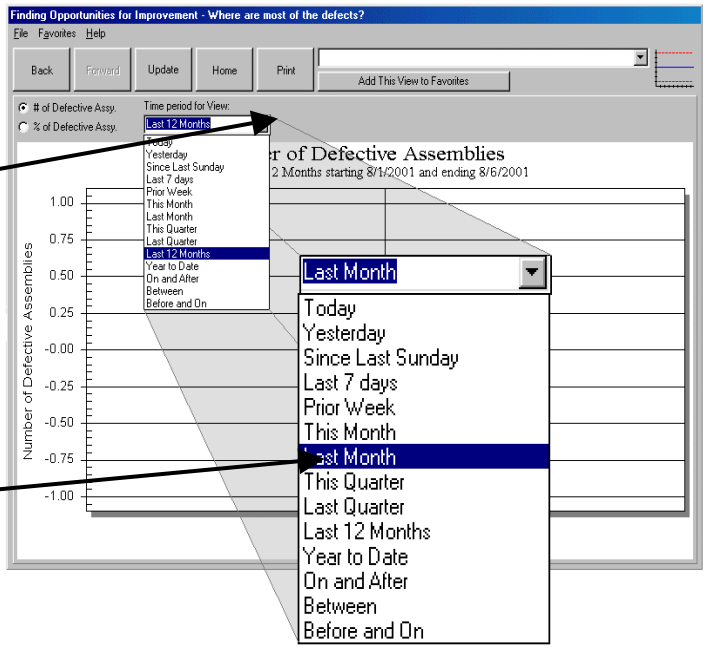
The # of Defective Assy., % of Defective Assy. and Time Period to View buttons.

A green data bar is also visible.

Our first step will be selecting a time period to review.

**Place the cursor on the arrow button**

**and Click**. A list of choices will appear.




Management asked for an analysis of data from last month.

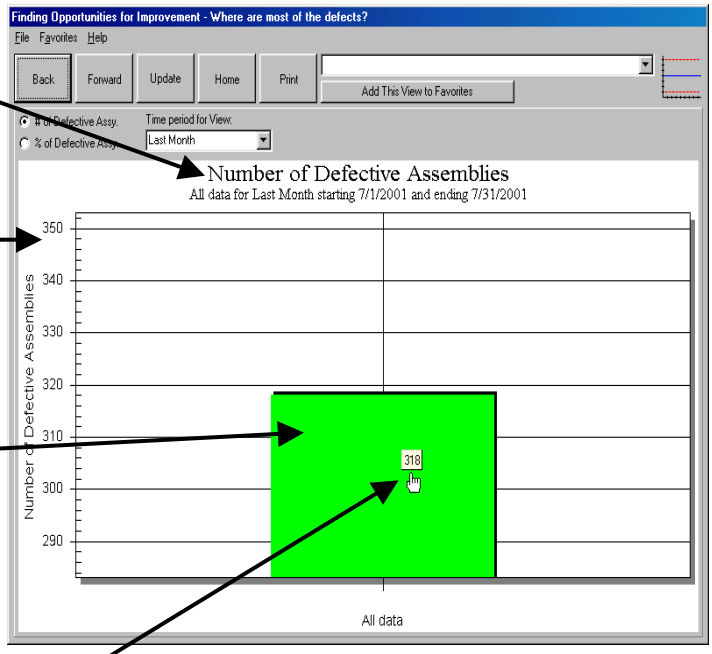
**Select last month with a click.**

The title of your current graph is shown. The name changes with each screen selection and identifies where you are at any time.

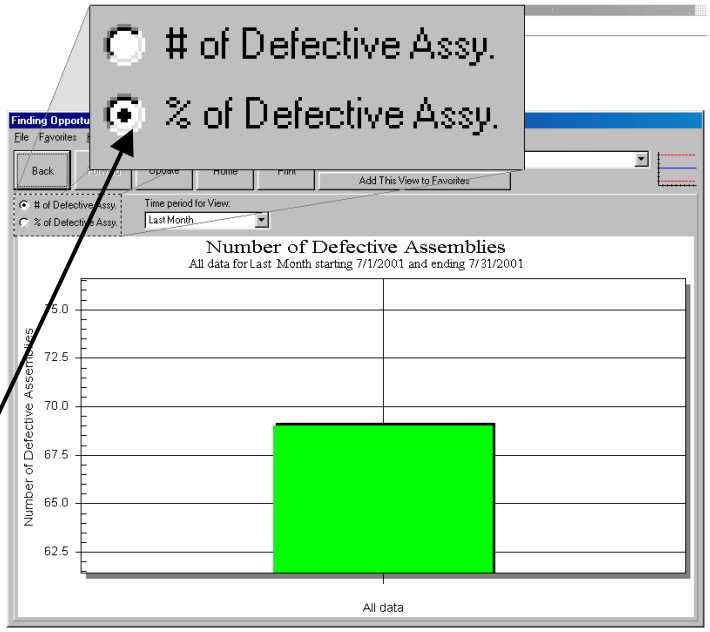
Notice that the values on the left side of the graph have changed. These values adjust automatically according to the available data.

Also visible is the single bar.

To view the exact number of defects, move the cursor anywhere over the bar. The icon changes to a hand pointing to a number.



You know that the "Total Number of Defects" does not always give an accurate view of the story. The percentage of defects that occurred last month would often be a better indicator of a control problem than the total number of defective assemblies.

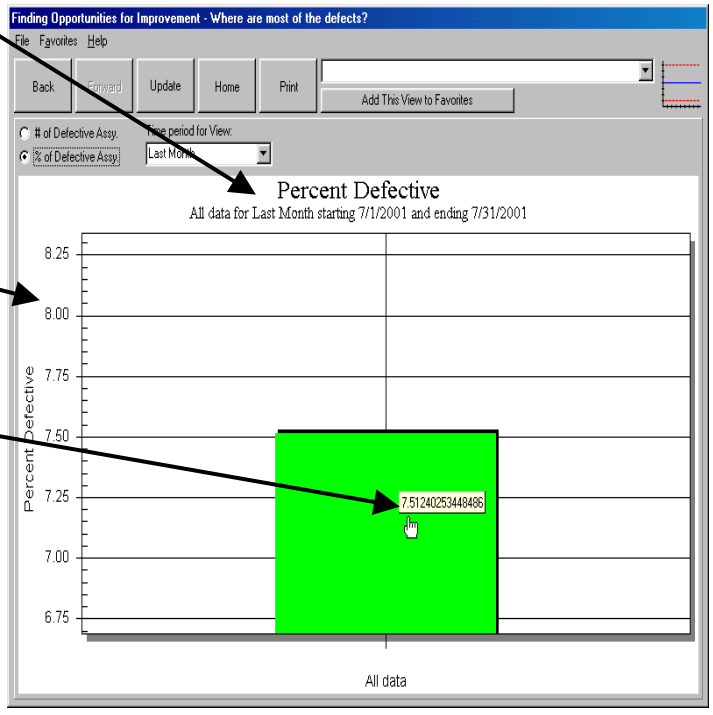



**Click here to change to the Percent Defective screen.**

Again the title on the chart has changed to reflect the data that is currently being displayed.

The numbers on the left side of the graph have also changed to show percentages rather than the number of defective assemblies.

As before, the cursor will change to show the exact percentage by placing it anywhere over the green bar.



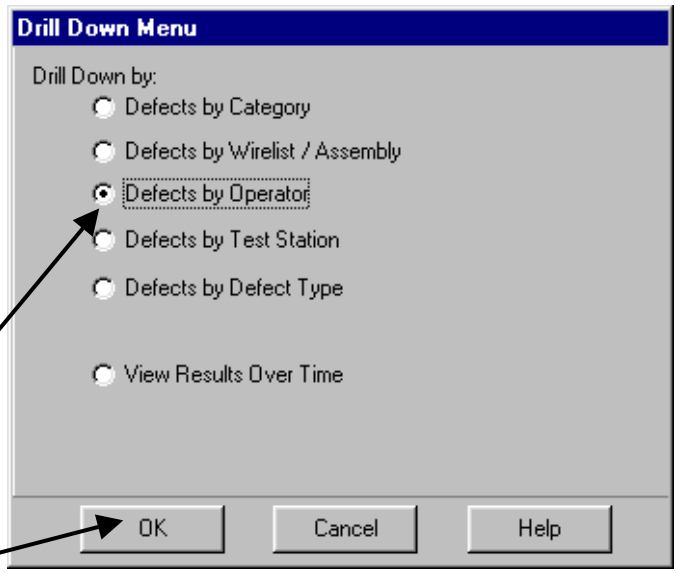

This percentage reflects all of the defective assemblies for all Operators, Wirelists, and Test Stations. Let's look at more specific data as part of our research.

**With the cursor over the green bar, click**.

## Drilling Down…

Clicking the green bar makes a drill down menu available.

Here we can see one of the many benefits of the SPC made easy software. Note the variety of choices offered in which data can be explored.

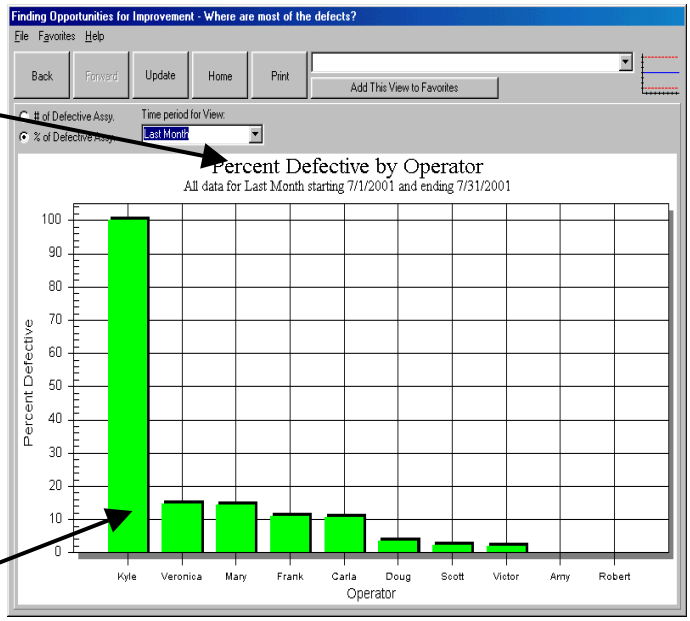



Remembering that some of your operators have recently complained about problems, you decide this is a good place to begin your search.

**Select "Defects by Operator"**

**Click the OK button.**

The title of the graph changed to show the data is now sorted by Operator.

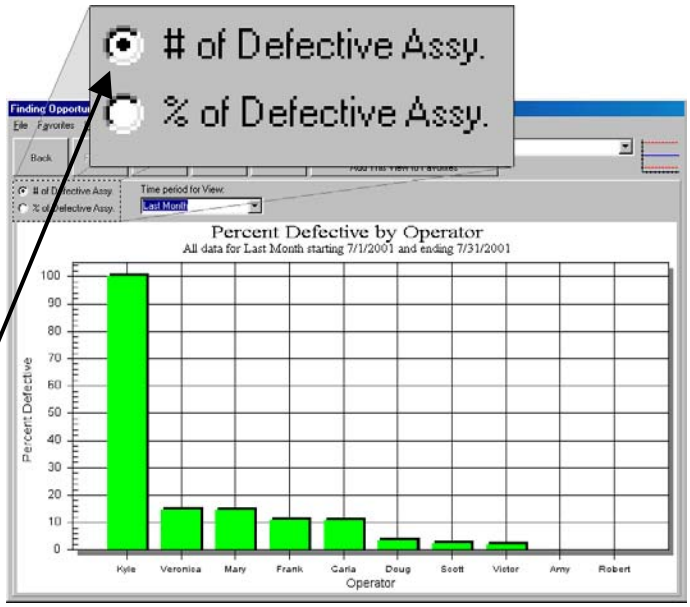



The chart is now in "Pareto" form. The pareto view is characterized by a bar chart sorted with the highest number first progressing to the lowest number. This provides a quick view of what is the most likely area to look at and what areas may not require scrutiny.

At first this chart is alarming. Kyle has 100% defective assemblies.

100% of defective assemblies would seem to indicate a problem.

Let's find out how many defective cable assemblies Kyle made. A large number of defective assemblies could be exactly what we are looking for!

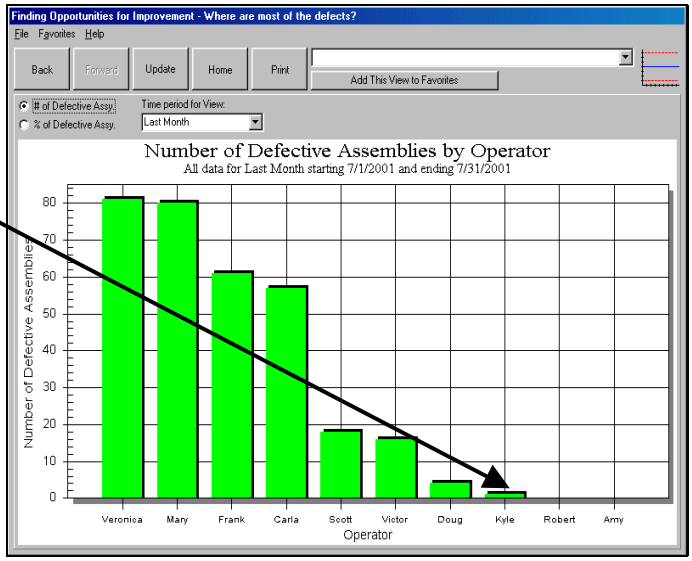



**Change back to "Number of defective Assemblies" by clicking the radio button**.

The values on the chart have re-addjusted to display the desired information.

Looking at the operator names, Kyle is now at the low end of the chart.

This chart shows Kyle only had one defective cable in July. It turns out the cable was a special order and Kyle was provided with an old revision of the drawing. After discovering the problem, the cable was re-worked by Doug to the new rev.



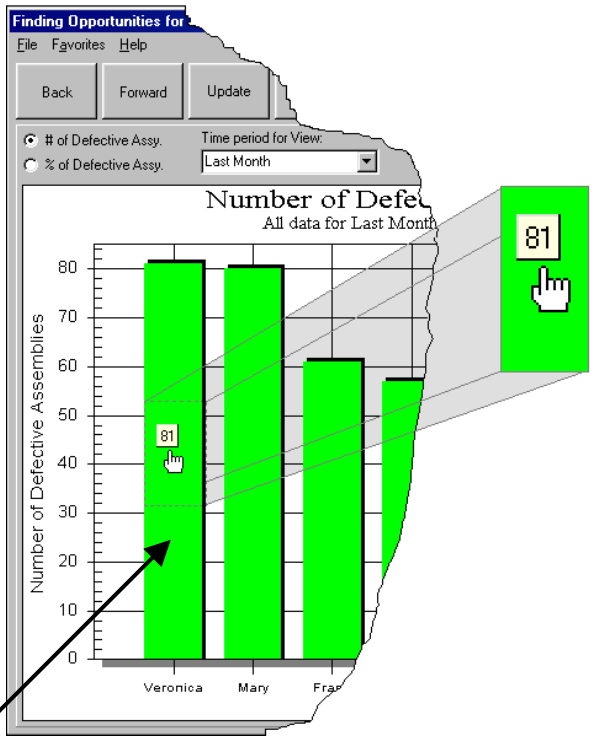

You know Kyle's one cable did not cause the significant increase in last month's number of defective assemblies. The answer to our dilemma might not be as obvious as we would have hoped.

With SPC Made Easy you can focus your research using the many variables offered to make finding a problem easy.

Let's take our search to the next level.

Recall in the last chart that even though Kyle only had one defective assembly, several operators had unusually high numbers of defective assemblies.

To investigate further, place the cursor over the bar for Veronica. The icon changes to a hand and shows the exact value for the bar.

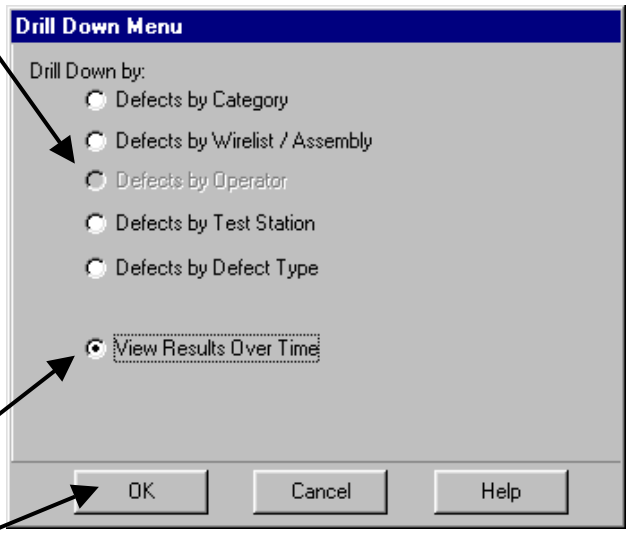



**With the cursor over the bar for Veronica, click.**

Again the Drill Down menu is displayed.

Notice that *Defects By Operator* is grayed out. That is because you are already in the "Number of Defective Assemblies by Operator" chart.

The operators began complaining sometime near the end of July about their cables not passing. Let's view the results over time to see if there is a pattern.




**Select "View Results Over Time.**

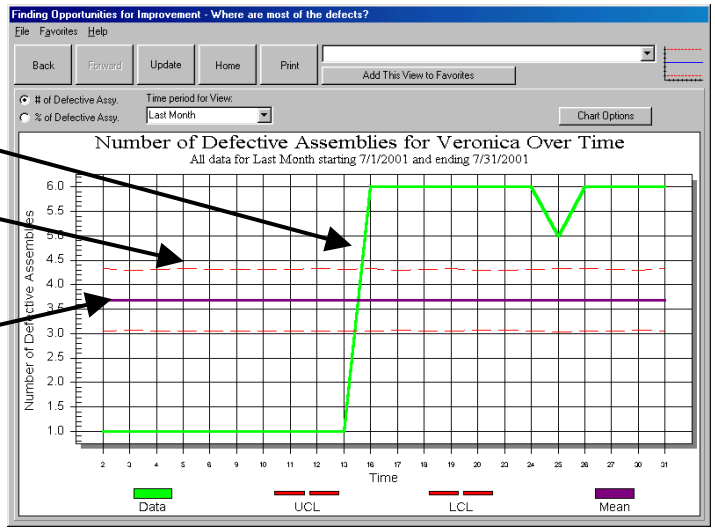
**Click the**  **button.**

The chart has now changed to an “n” chart.

The number of defects per day are displayed with a green line.

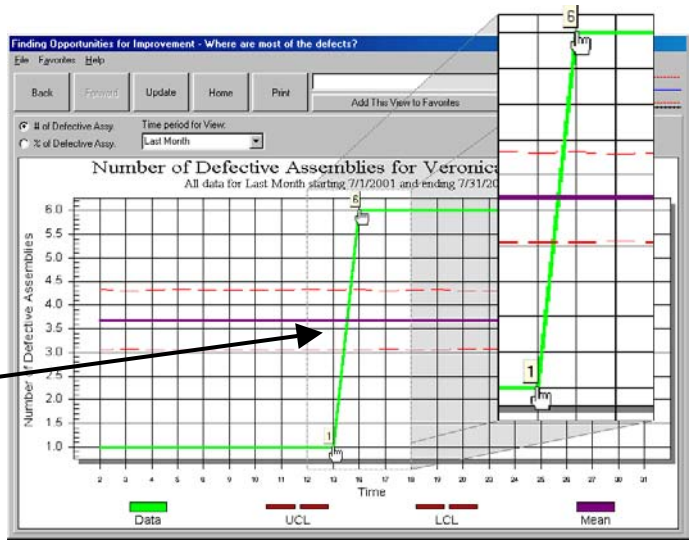
The upper and lower control limits are displayed in red. These dashed lines show standard 3 sigma limits.

The Mean is displayed in purple. The Mean is the average number of defects over this time range.




These values automatically update any time new data becomes available. When the cursor is placed at the intersection of any two data lines, the cursor changes to a hand pointing at a number. This is the exact value for that point on the line.

Notice that Veronica only had one defective assembly per day until the 13th. At that point the number soared to 6 then remained fairly constant through the end of the month.



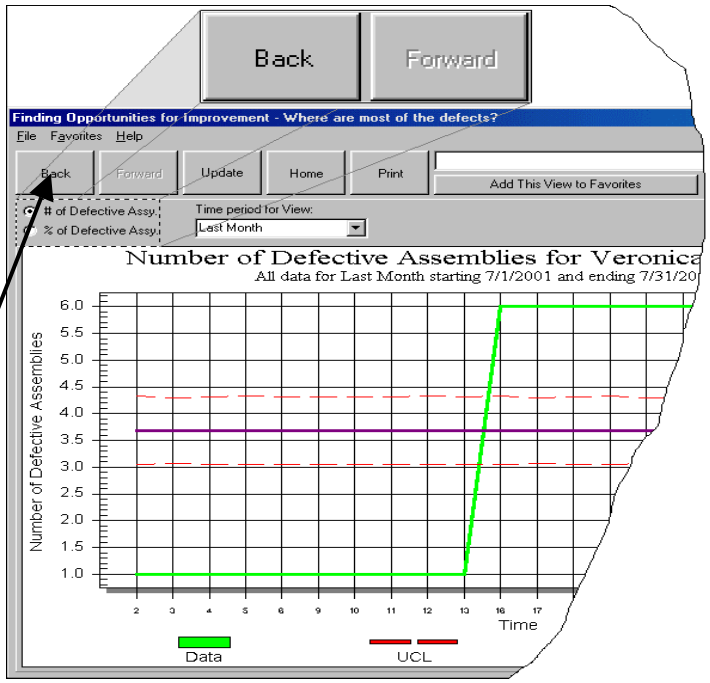

What caused this sharp increase in failures on the 16th?

What about the other operators?

At any time you can move forward or backward one chart by clicking on the Forward or Back button.

Let's return now to the "Number of Defective Assemblies by Operator" screen to look at the other operators.

**Click the Back button.**



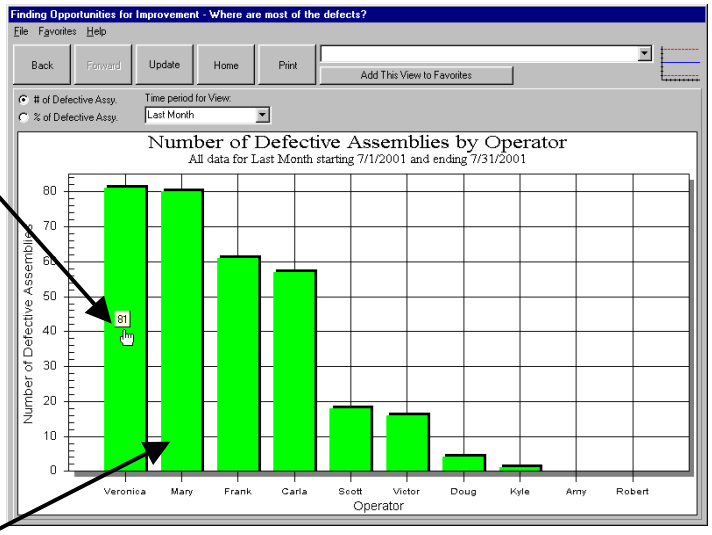

Looking at this chart, you see four operators whose numbers seem high.

Move the cursor over each bar one at a time. Notice the number that appears for each bar.

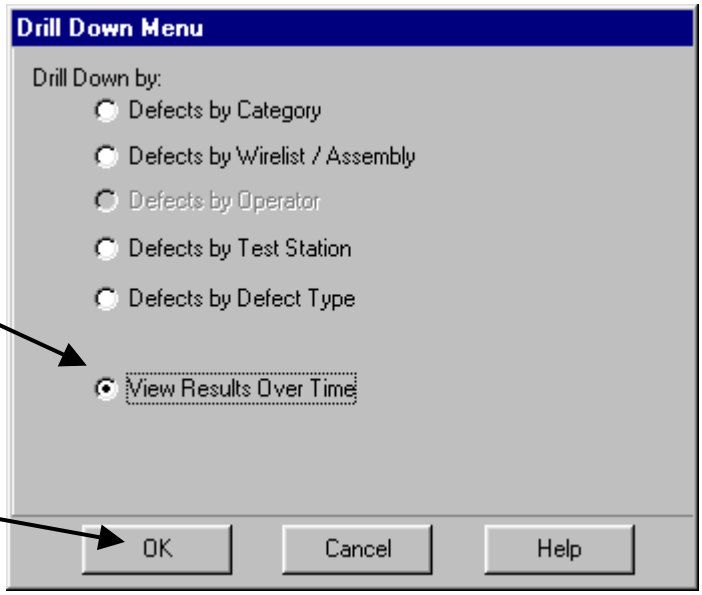
We know Veronica's defects increased on the 16th. What about the others?

To find out if a pattern might exist with the other operators lets repeat the process we used for Veronica.

**Place the cursor over the bar for Mary and click.**



When the drill down menu appears **select "View Results Over Time."**




**Click the OK button.**

Repeating this process for each of the other three operators, you discover that Veronica and Mary's number of defects both rose sharply on the 16th of July then remained high.

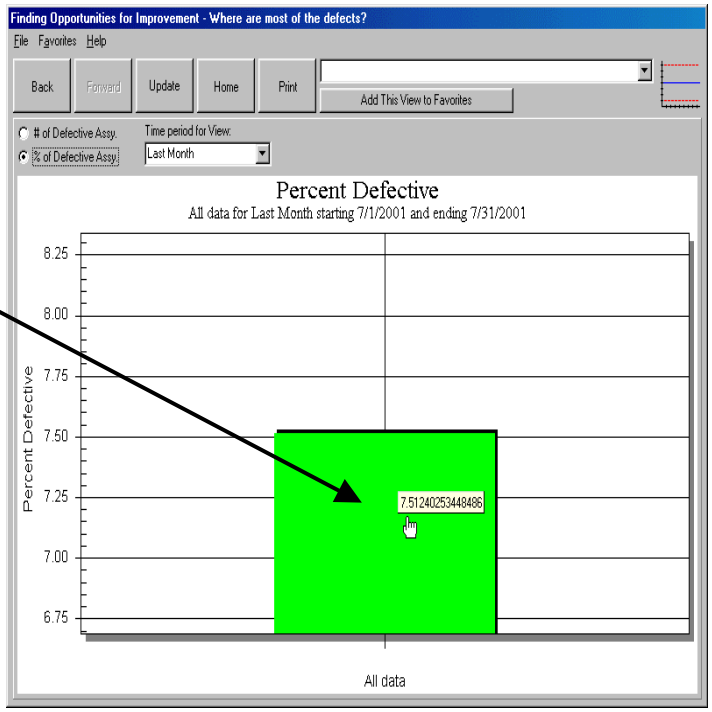
You also discover that Frank and Carla's defects both jumped on the 20th of July then remained high.

You know that Mary and Veronica operate the same line equipment over two shifts. Frank and Carla do as well. Is it possible that the problem is related to the test stations?

Lets find out if there is any relationship between operators and the test stations used.

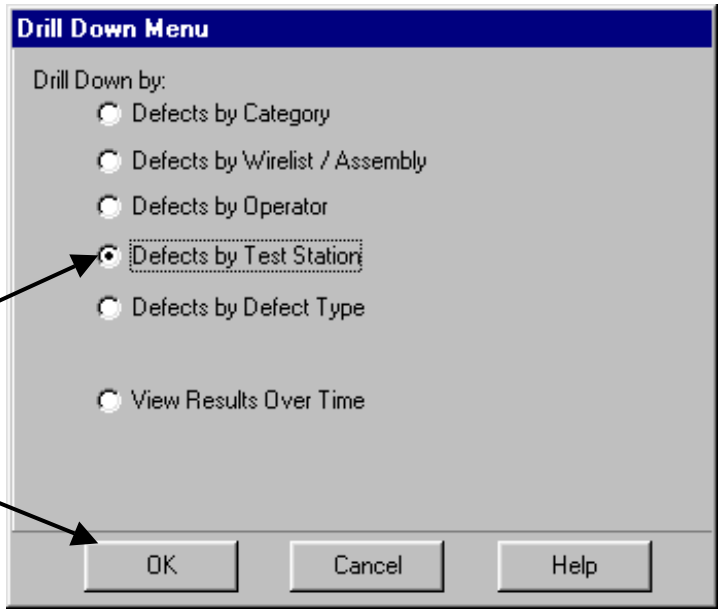
**Click the Back button until you reach this chart.**

**Place the cursor over the bar and click to bring up the Drill Down Menu.**



Once again the drill down menu appears.

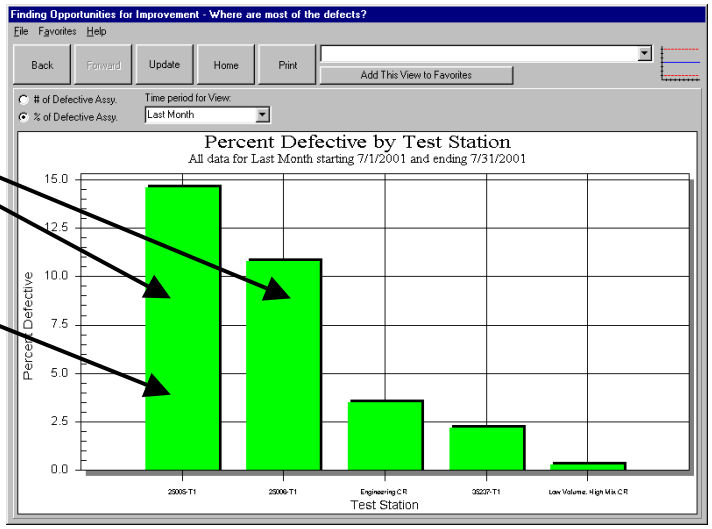
Let's look at the percentage of defects by Test Stations.




**Select "Defects by Test Station."**

**Click the OK button.**

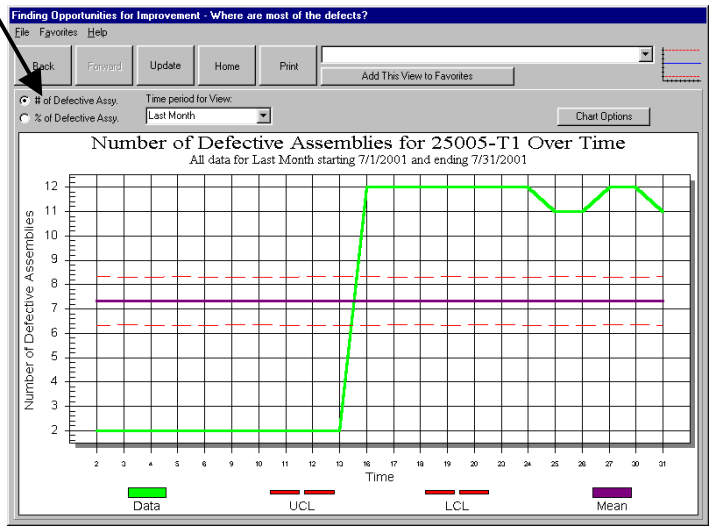
This chart shows that test stations 25005-T1 and 25006-T1 have high defective assembly rates.




**Click on the green bar for 25005-T1 to bring up the Drill Down Menu.**

**Select View Over Time and click OK.**

**Change to # of Defective Assy. by clicking on the radio button.**




The problem appears to have occurred on the 16th of August on this test station. It also appears to be a problem that applies to more than one operator.

## Solution

With this information, you go to the test stations to determine if anything changed. You have Mary check the tools at her test station and discover her crimp tool is defective. She remembers getting a new one about the time she started having trouble. Because it was new she never suspected it was defective.

Frank's test station also has a defective crimp tool even though he hadn't replaced it. Going to the tool room you find that Carla checked out a new crimp tool on the 20th for the test station she shares with Frank.

Checking the remaining crimp tools in the tool room you find that they all have the same manufacturers defect

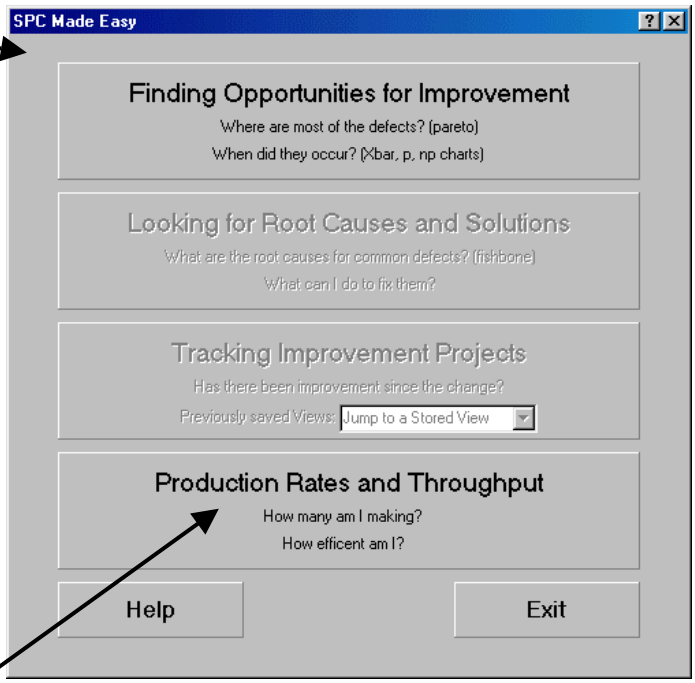
After replacing the crimp tools, the defective assembly numbers on your assembly lines return to normal.

**Return to the Main Menu at any time by clicking on the** Home **button.**

## Getting Started with Production Efficiency…

You are the production manager for Quick Connect Cable Inc. You are curious about how much and how well production on the floor is going. You have three lines that you are interested in because they all produce the same product. You hope by comparing the three production lines you might discover what works well and what needs adjustment in order to improve efficiency for the plant.

Start with the Main Menu.



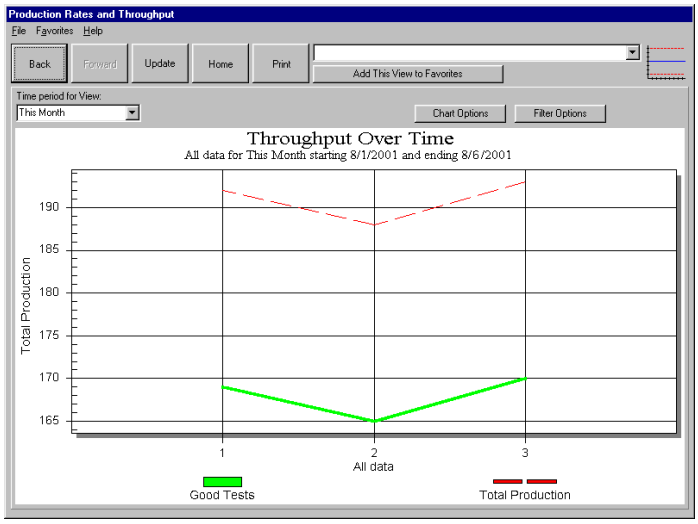

Below the Production Rates and Throughput button you see two questions.
How many am I making?
How efficient am I?

Efficiency is the gap between the total production and the ‘good’ production.

**Click on the Production Rates and Throughput button.**

The first window of the *Production Rates and Throughput* view appears, which is an "n" chart, over time.

The menu and button bars perform the same functions as in *Finding Opportunities for Improvement*. We will look at the differences a little later on.




The green line shows the total 'Good' production for the first three days of August.

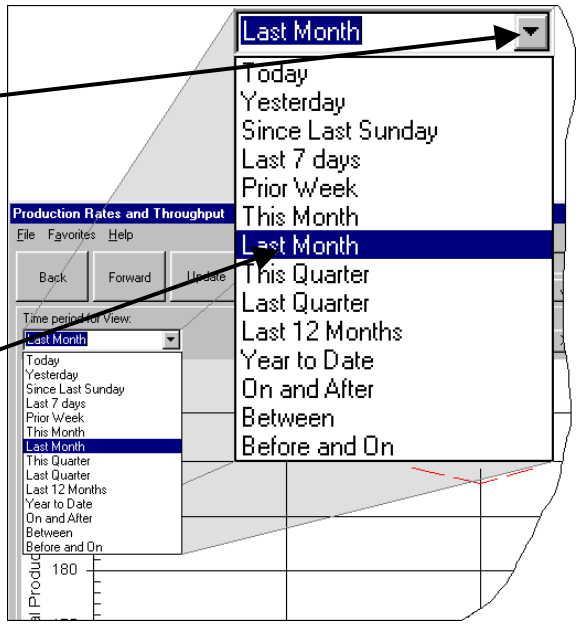
The red line shows the total production, a combination of the 'Good' and defective assemblies.

Your main interest lies in the data for Last Month.

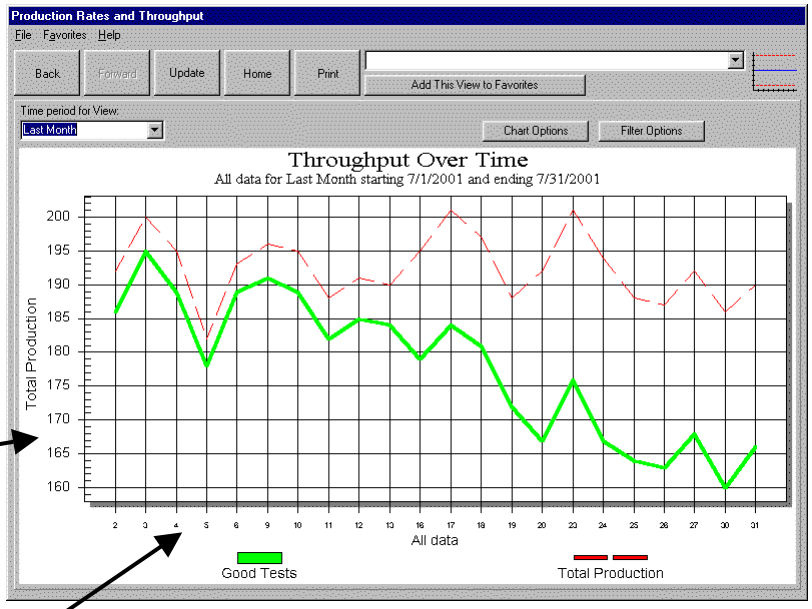
**Click the button.**

A drop down menu appears with a list of choices.

**Select "Last Month" by clicking.**



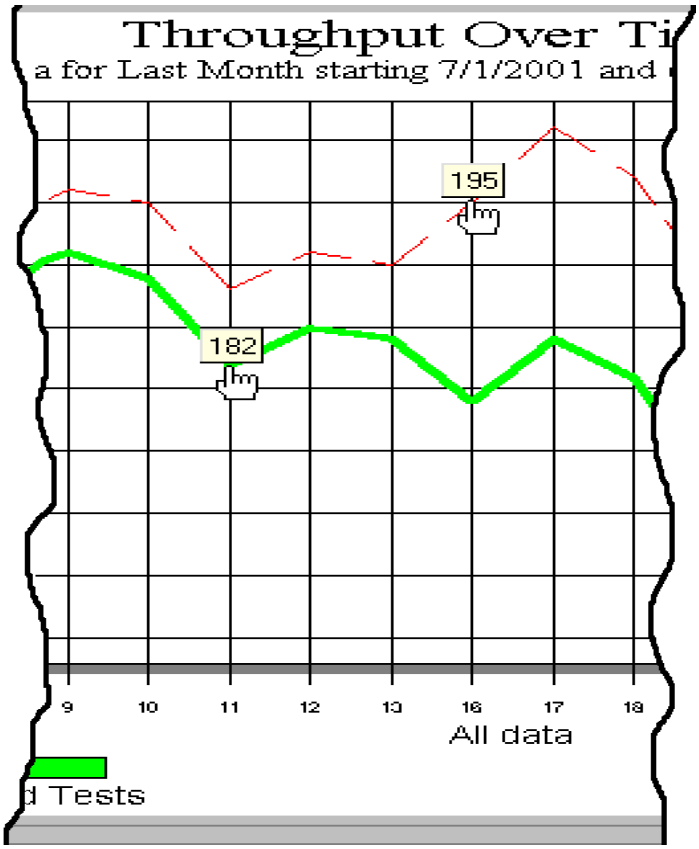
This chart shows you all of the production in the plant for last Month, regardless of the Operator, the Test Station, or the Wirelist.




The values on the left side of the graph automatically adjust each time new data is displayed.

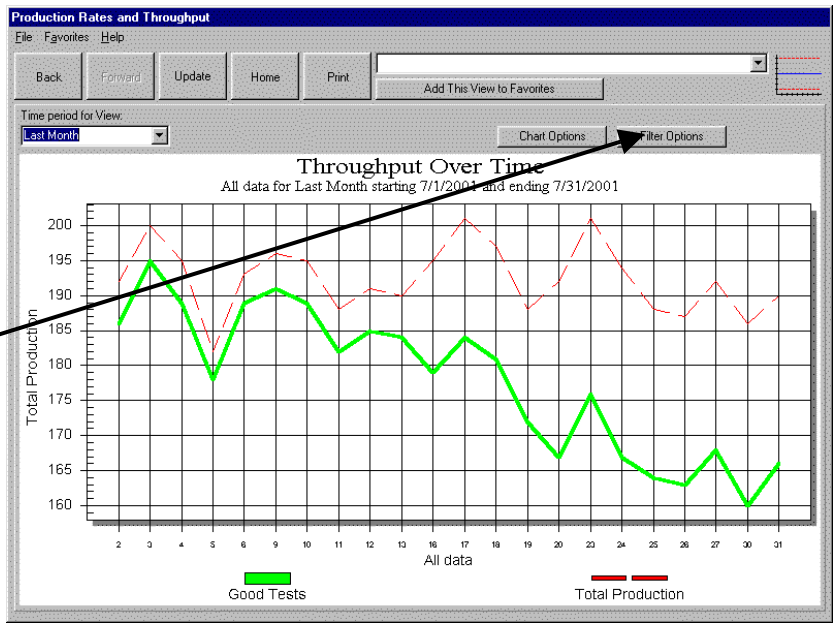
The values along the bottom of the graph also automatically adjust based on the time period you have selected. This view is in days.

To display the exact value for a point on the graph, place the cursor at the intersection of the lines you are interested in and the value will appear.



Let's compare the three high volume lines that all make the same part using Test Stations 25005-T1, 25006-T1 and 25007-T1.

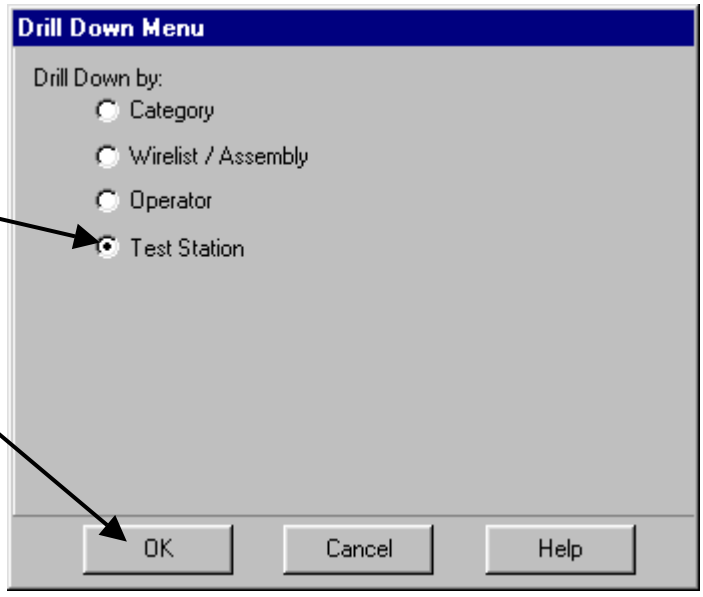
**Click the Filter Options button.**




The filter options window will appear.

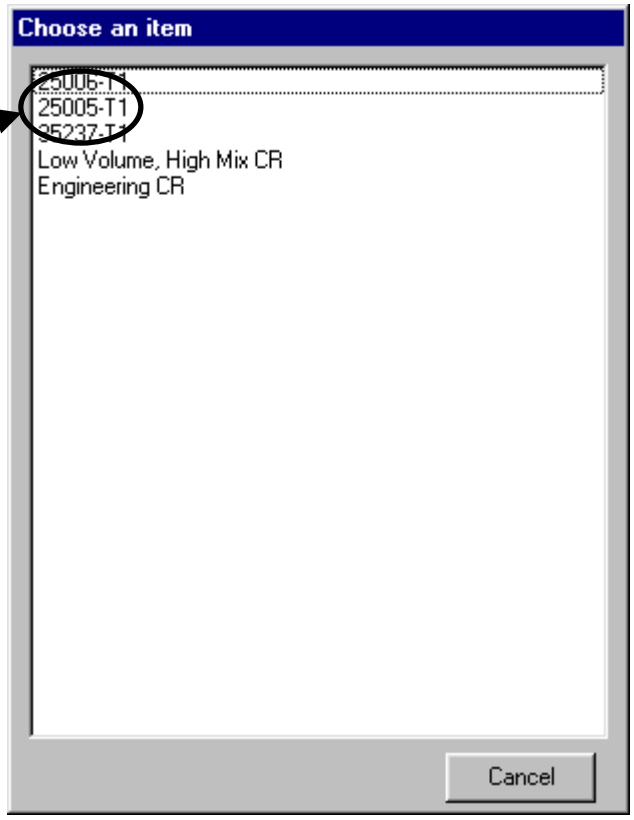
**Click on Test Station**

**Then click** OK.



A list of all of the available test stations will appear.

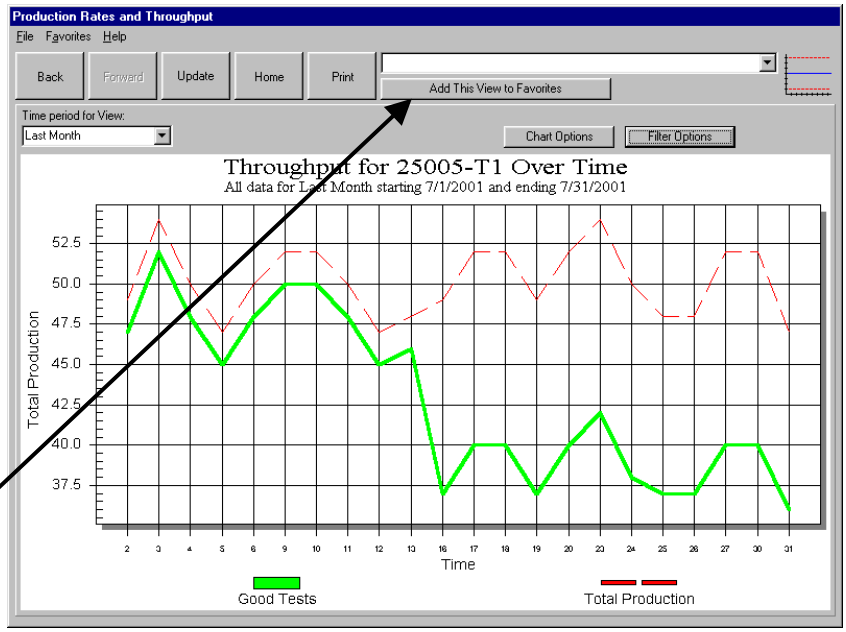
**Click on 25005-T1.**




The filtered chart will appear. The data now reflects only the production for this test station.

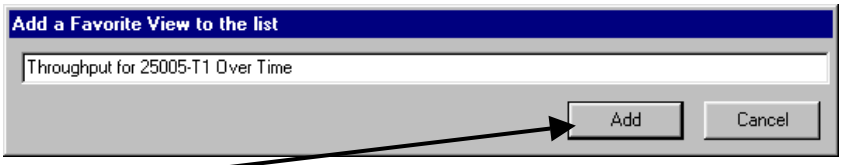
We might want to look at this specific graph again soon. Let's store it in the Favorites for later retrieval.

**Click on Add This View To Favorites**



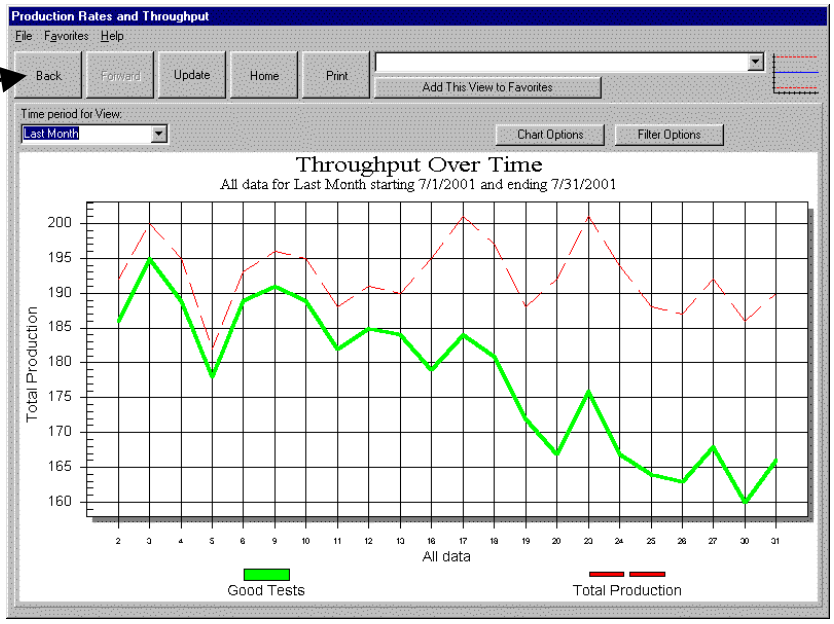
The title of the chart is fine to name this favorite view.

**Click Add to add the favorite to the favorite list.**




On the current chart,

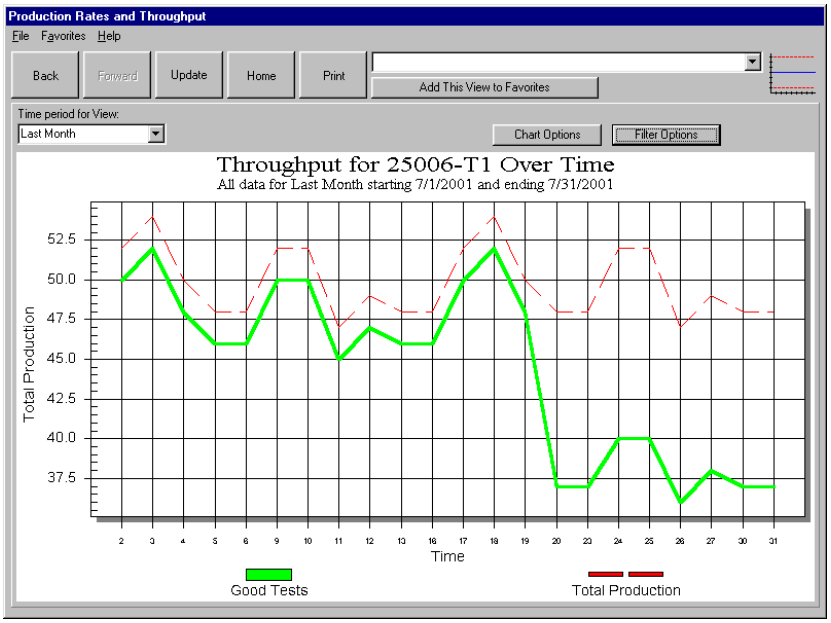
**click the Back button** to return to the view where we can look at another Test Station.



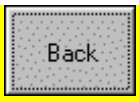

Follow the same process as before,

1. **Click Filter Options**
2. **Choose Test Station**
3. **Pick 25006-T1 from the list.**

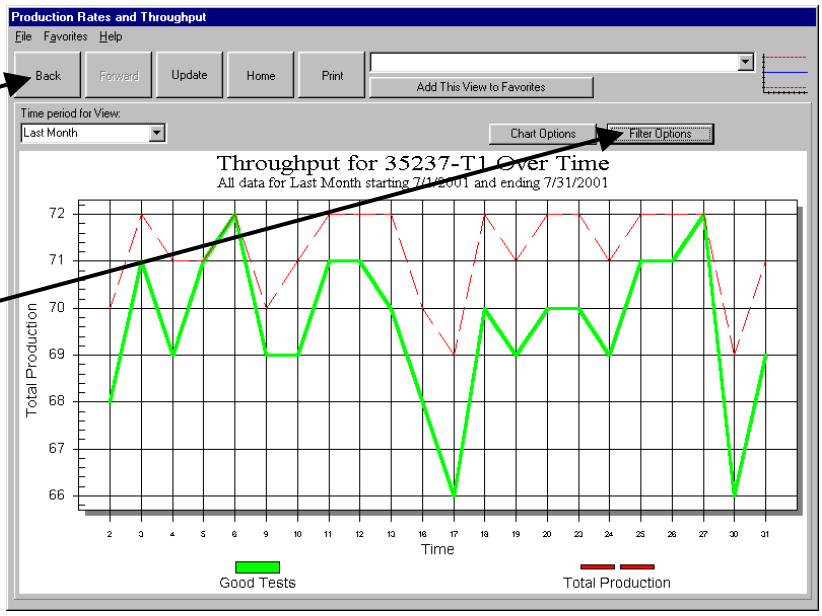
**Add this view to the Favorites list as well.**



For the final time, repeat the process:

1. **Click** 

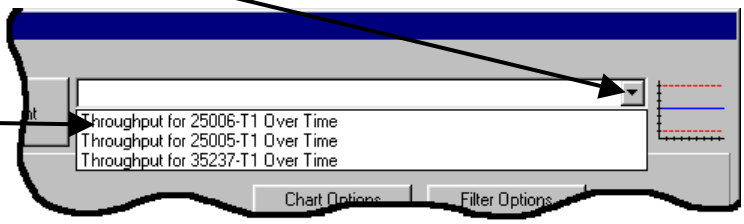
**on the current chart**
2. **Click Filter Options**
3. **Choose Test Station**
4. **Pick 35237-T1 from the list.**



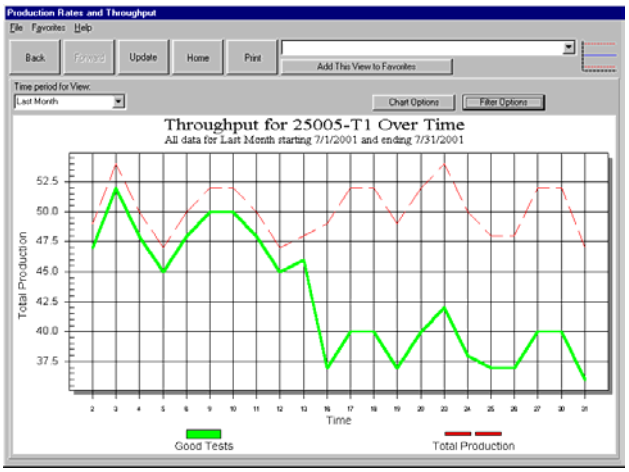

**Add this view to the Favorites list.**

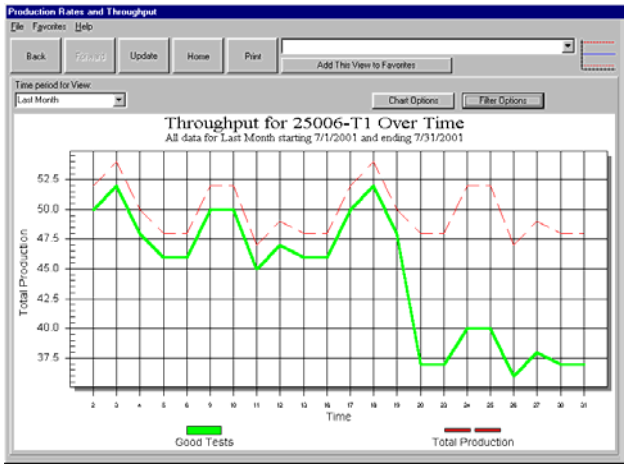
To compare the views, click on the button next to the Favorites window.

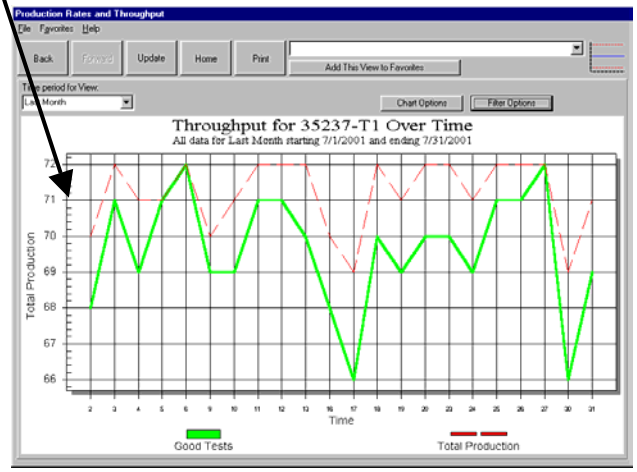
**Choose which view you want to review and the view will appear.**



After looking at the three charts, you determine that the line using station 35237-T1 is substantially more productive, even with its occasional low spots.




You plan to meet with the operators to find out what they do to be so productive so that the others can benefit from their improvements.

Thank you for participating in our demonstration. Feel free to explore SPC Made Easy, the demonstration software works just like the original with a few exceptions. Those features are grayed wherever they occur.