Resource Management:
Resource Allocation Analysis

Introduction

One of the goals when implementing a project management system throughout an enterprise, division, or a department is the ability to perform resource management. With the limited set of resources that are available, project managers, resource managers, and /or upper management must always be in tune with how much existing resource availability there is, especially when contemplating a new project being introduced within the organization.

Overallocating resources causes an increase in project costs due to overtime, and creates excess stress on the resources. Overallocating resources as you build your project plan is easy to do. Since you assign resources one task at a time, it is difficult to keep track of how many units of any given resource have already been assigned in a particular time period. The same resource could end up being assigned to several parallel tasks. Finding and resolving overallocations can help the project manager avoid costly schedule conflicts and unexpected schedule overruns as the project progresses. Underallocating resources is also a concern for the project manager. Idle resources can cause an excess burden on project costs, for example, when expensive machinery and computers are sitting unused.

PS8 provides several mechanisms for helping you identify your current and future resource obligations. With the use of PS8's *Resource Histogram* graph, *Reports*, *Task Filters*, and your *Gantt Chart,* you can easily identify which resources are overallocated and which resources are available to perform additional work. The remainder of this paper will discuss using PS8's extensive resource management capabilities for use with a single project. Once you are comfortable with the techniques used in a single project environment, a multi-project approach will be discussed.

Techniques

There are two techniques for finding allocation levels within PS8. The first technique consists of using any of the Resource Utilization reports found within the Reports view. The second method is to use PS8's *Resource Histogram* and *Overallocation Search* feature to find overallocations.

985 University Avenue ● Suite 5 ● Los Gatos, CA ● 95032
Phone: 800.533.9876 ● Fax: 408.354.0122 ● Email: sales@sciforma.com
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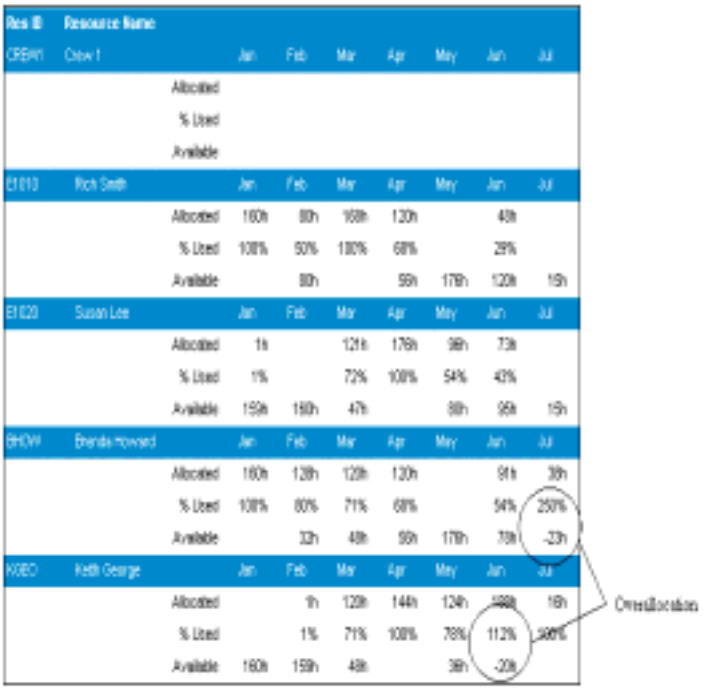
Resource Utilization Reports



PS8 ships with five resource utilization reports, differing only in the time periods they look at. These reports provide you, by resource, the amount of time each resource is allocated, percentage of their availability they are assigned, and how many available hours are left on a time period-by-time period basis. The use of these reports is an excellent way to not only find overallocations within a given time period, but also to find under-allocations for your resources. A good tip is to run one of these reports and print it off. It will prove invaluable as you are trying to find an available substitute resource in a given time frame for an overallocated resource.

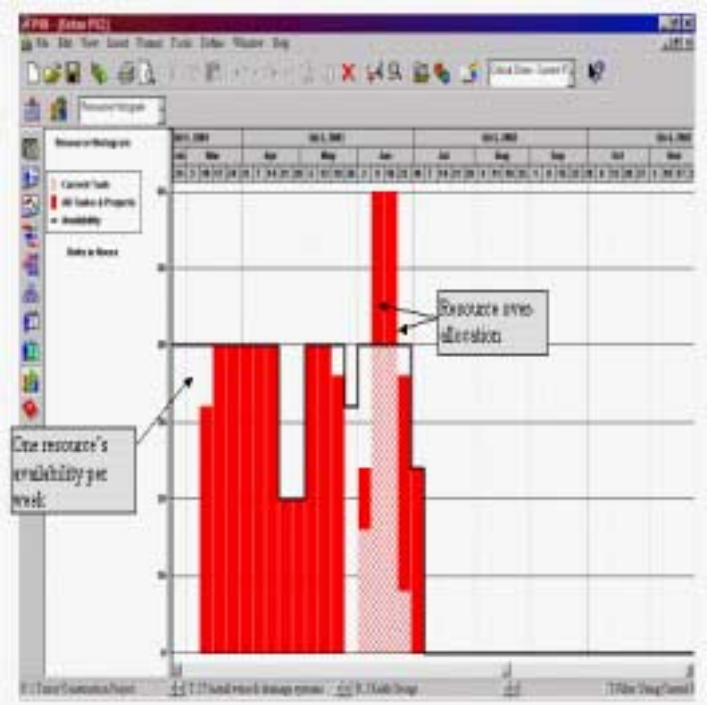
Resource Histogram

The *Resource Histogram* is a graph that displays a single resource's usage over the entire project. (This is not to be confused with the *All Resource Histogram*, which displays all your resources' usage over the entire project.) It can quickly point out to the project manager where resources are overallocated or underallocated within specific time frames. The project manager needs to view the allocation of individuals across projects over time so that overloads and gaps in utilization can be spotted.

The *Resource Histogram* symbols identify time units (hours, days, weeks) along the vertical axis, and solid red bars along the horizontal axis representing the resource effort for the active resource. (The active task and the active resource are displayed within the Project Bar at the bottom of your screen.)

The cross hatched patterns show the amount of resource effort for the active task. The black horizontal line drawn across the histogram is the active resource's availability for a given time period and is derived from the *Availability* field in the Resource List. In addition, *Time Phased Availability* and specific *Calendars* assigned to a resource are also taken into consideration when displaying an individual's availability, if these fields are used. Any planned effort that appears above this line is an overallocation of the resource and below the line is an underallocation. An efficient use of a resource will show the bars drawn up to the availability line.

In the *Resource Histogram* pictured below, the entire work load for Keith George is displayed. In analyzing the graph, you can see that he is scheduled to work on Task 17 (Install water & drainage systems) 40 hours during the week of June 9 as indicated by the cross hatched pattern. His workload across all tasks in that week is 60 hours but he is only available to work 40 hours, therefore he is overallocated by 20 hours. To display his other task assignments, change the active task in the *Project Bar* by clicking the task spin buttons. To view another resource assignment in the project, simply change the active resource in the *Project Bar* by clicking the resource spin buttons.



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Setting up Your Environment
When looking for overallocations in your schedule, there are several things you will need to know:

- What resource is overallocated?
- How much is the resource overallocated?
- In what time period(s) is the resource overallocated?
- What tasks are causing the overallocation(s)?

These questions can easily be answered by following the setup procedures described below.

Activating the Resource Histogram Split Window

A convenient view for evaluating resource allocations is a split window with the Gantt Chart on top and the Resource Histogram on the bottom. In this view, you can easily identify overallocated resources, the time periods of the overallocations, and the tasks causing the overallocation. This view makes it easy to see the tasks directly above the associated resource usage. As a split window, the Resource Histogram is time coordinated with the Gantt Chart time axis settings. As you zoom the Gantt Chart, the time axis in the Resource Histogram changes.

(NOTE: Your zoom level has a major impact on finding overallocations within your schedule. A resource that is overallocated at the week zoom level, may not be overallocated at the month zoom level due to additional available time during the month. When searching for overallocations within your schedule, generally either day or week zoom levels are recommended.)

In order to create the Gantt/Graph split window in PS8, select *Window*, *Split*. Click within the top window pane and switch to the *Gantt Chart* view  . Next, click within the bottom window pane and switch to the *Graph* view  . Within the *Graph* view, select *Resource Histogram* from the graph selection dropdown list.

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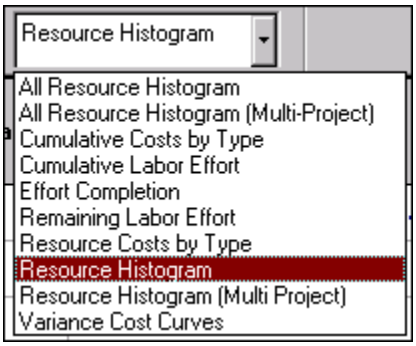
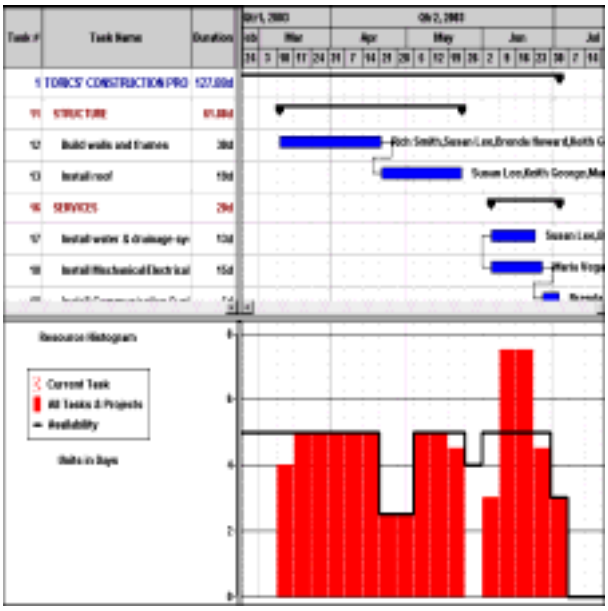


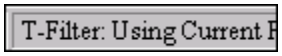


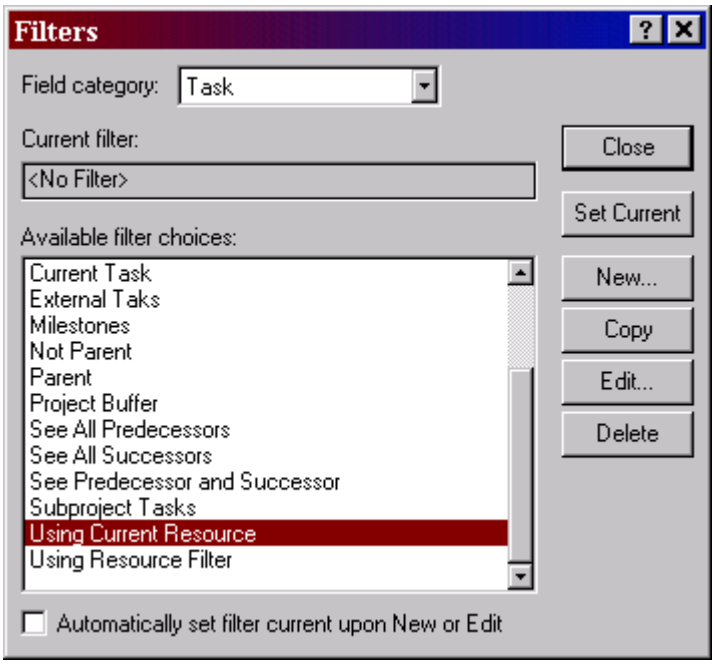
Using Current Resource Task Filter

Using the *Gantt Chart* and *Resource Histogram* graph to find the task(s) causing the resource overallocation is an important process. If a resource is working on several parallel tasks, you would want to examine each task in order to determine any corrective measure to resolve the overallocation. You may find it helpful to use the task filter function in this process. The *Using Current Resource* task filter displays only the tasks that the active resource is working on in a given time period. In this way, all other task information is removed from the Gantt Chart allowing you to focus on tasks in which the active resource is working.

In order to activate this filter, select *Define, Filters…* Within the *Field category* drop down list, select "*Task*" if needed. Within the list of filters, scroll to the bottom of the list and select *Using Current Resource* and click *Set Current*, then *Close*.

When a filter is activated, PS8 informs you of the type and name of the filter at the far right hand side of the *Project Bar*.





NOTE: Do not be alarmed if your entire schedule disappears. This will occur if your active resource is not utilized within the project. Within the Project Bar, use the spin boxes to view a different resource.

Starting Time Period

When PS8 looks for overallocations in your schedule it starts at the first time period displayed by your time axis and moves to the right through time. This means that if your project is scheduled to start in January 2002 and your current view starts in July 2002, PS8 will not flag any overallocations that may exist between January and July. Therefore, to ensure that PS8 finds all overallocations in your project, make sure that your project start date is visible within your Gantt/Graph view.

Identifying Resource Overallocations

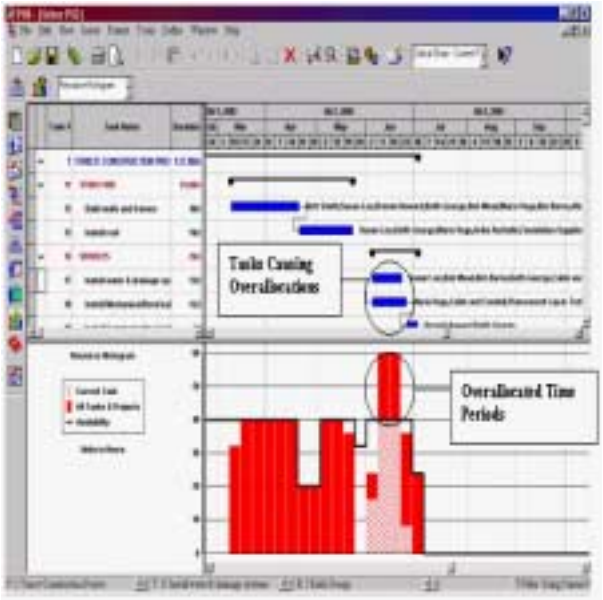
Resource overallocations result from assigning resources for more time then they have available. If a labor resource works 8 hours/day for 5 days a week, then the availability of that resource is 40 hours per week. Assigning this resource to more than 40 hours per week would overallocate the resource. The effect of the overallocation on the schedule depends upon the resource and the amount of the overallocation. A single labor resource may be physically able to work 50 hours per week for a short period of time. However, this resource would not be effective if expected to work 16 hours per day for a long period.

Resolving resource overallocations in the early stages of the project will help avoid unexpected

schedule overruns as the project progresses. PS8 provides the *Overallocation Search* function to quickly find any overallocated resources in your project.


You activate the search by clicking on the *Overallocation Search* secondary toolbar button that appears when the *Resource Histogram* is the active view. PS8 searches the project starting from the time period currently displayed to the end of your project, resource-by-resource, until it finds an overallocated resource within the displayed time scale. When an overallocation is found, PS8 displays the resource name in the *Project Bar* and the time period of the overallocation in the *Gantt Chart*. To find the task(s) causing the overallocation, simply align any tasks in the *Gantt Chart* which fall within the time period of the overallocation. Clicking on each task displays a cross hatched pattern in the *Resource Histogram* for the amount of time the resource is scheduled to work on the active task.

When you are finished analyzing the current overallocated resource, continue clicking the *Overallocation Search* button to find additional resources that are overallocated in your schedule. When your schedule no longer moves, this represents that there are no additional overallocations found.

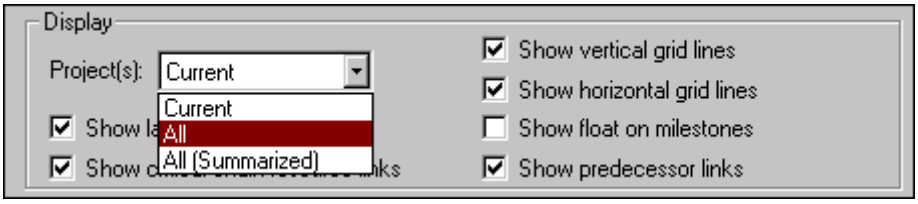


Multi-Project Overallocation Searches
The process for finding overallocations within a multi-project environment is fairly similar as you would in a single project environment, except for two settings:

- Display a multi-project *Gantt Chart*
- Use the *Resource Histogram (Multi Project)* graph

Multi-project Gantt Chart

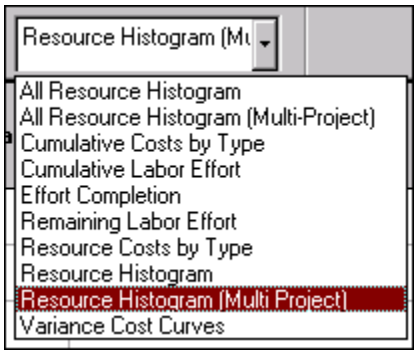
In order to display multiple projects on your Gantt Chart, you will need to adjust your Gantt Chart format options. Select *Format, Gantt Chart…* Within the *Chart* tab, select *All* from the *Project(s)* dropdown list. Then click *OK*.



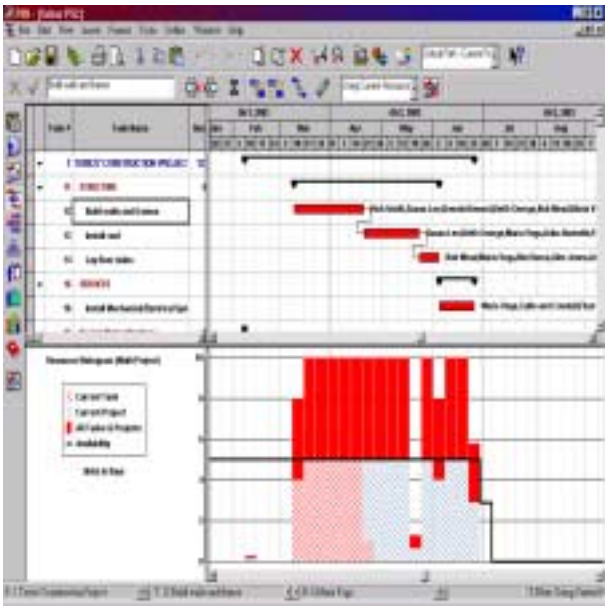
Resource Histogram (Multi Project) Graph

The other change that needs to take place to view allocation levels across multiple projects is to display the *Resource Histogram (Multi Project)* graph. This graph is very similar to the *Resource Histogram* graph, except that it displays allocation levels across all open projects.

From within the *Graphs* view, select *Resource Histogram (Multi Project)* from the graph selection dropdown menu.



When viewing the multi-project resource histogram, you will notice an additional attribute, the *Current Project* description. When reviewing resource allocation levels, when you see the blue hatched pattern, this represents how much of the resources workload is assigned to the current project (as noted within the *Project Bar*).



This can be quite useful when you are reviewing hours against multiple projects. As PS8 cycles through your resources during the overallocation search, it is helpful to know which projects are contributing the most to the overallocation.

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