

# *PERCEPTION*<sup>®</sup> WORK-PAC

## **Modeling Shipyard Manpower**

*A Training Tutorial*

**This training guide outlines the basic features of the *PERCEPTION* system for modeling manpower requirements across the shipyard.**

**It is a supplement to the user manual entitled “*PERCEPTION Labor/Manpower Planning & Cost/Schedule Management*,” which provides more details for the user.**

**Before using this training guide, the user should first view the preliminary training guide, “*Getting Started With PERCEPTION.*”**

**An analysis of manpower requirements is important for determining whether or not planned labor hours, in conjunction with planned schedules, are realistic and will result in a successful project.**

**Other related training tutorials are the following:**

- 1. *PERCEPTION* Starting A New Project**
- 2. *PERCEPTION WORK-PAC* Starting From Scratch**
- 3. *PERCEPTION WORK-PAC* Manpower Planning & Forecasting**
- 4. *PERCEPTION WORK-PAC* Work Orders**

**This tutorial describes how to model the shipyard's manpower requirements at a gross level of detail, project by project.**

**The value of this analysis is that it can provide a good **overview of the planned work load across the shipyard.****


**The analysis can identify periods of time where planned work schedules may adversely impact available manpower resources.**

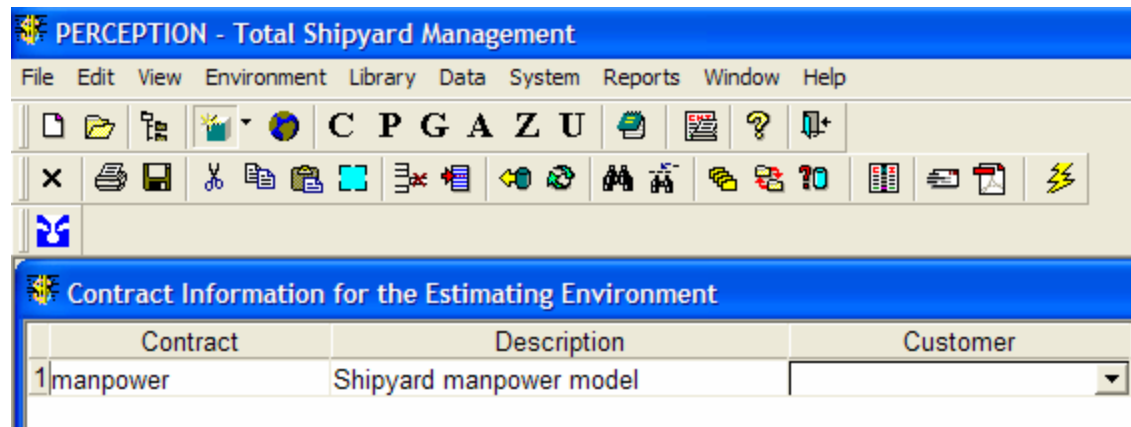
**The analysis also can identify periods of time where planned work schedules may leave under-utilized manpower resources, when additional work would be desirable.**

# Creating A New Model


**A shipyard manpower model begins with the user creating a new contract, under which all projects to be included in the model can then be created.**

To create a new contract, click on the *Contract* button  on the tool bar.

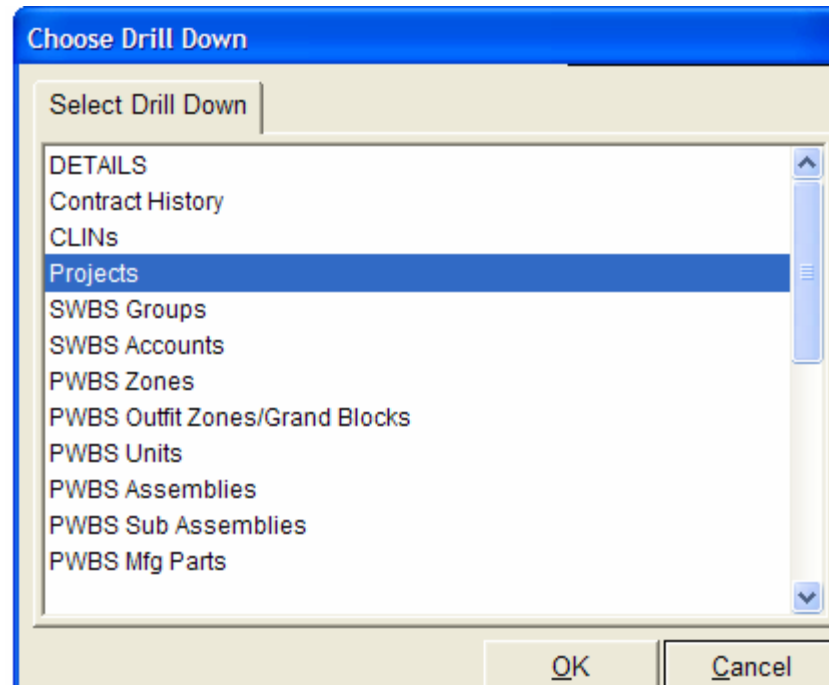
Click on the *Add* button  and enter the contract ID and description for the model.



When finished, save the new contract by clicking on the *Save* button. 

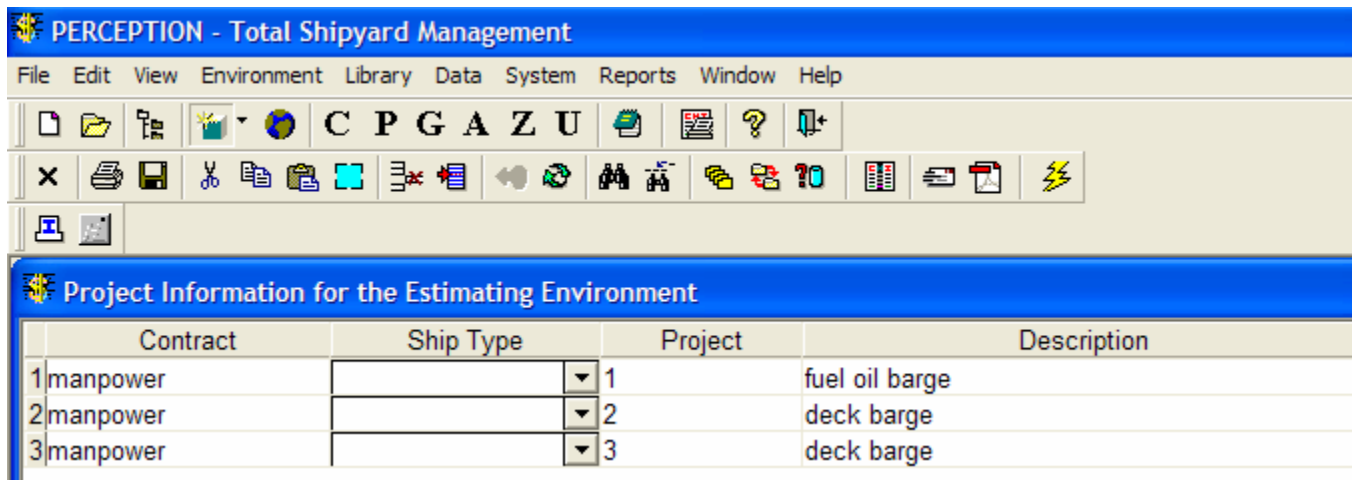
To create projects for the model, click on the *Drill-Down* button  on the toolbar.

Select *Projects* in the list displayed by the system.



By using the *Add* button on the toolbar, begin adding model projects in the Project Worksheet.

Only the project numbers and their descriptions are required.



When finished, save the projects by clicking on the *Save* button. 

# Defining Model Project Work Orders

Each project needs to have gross-level work orders defined, complete with labor hour budgets and planned schedules.

These work orders provide the information needed by the system to generate manpower profiles for the project.

A project can be represented by one or more work orders, depending on the level of detail required for the model.

To create a work order under a project, highlight the project in the Project Worksheet.

The screenshot shows the PERCEPTION - Total Shipyard Management application. The main window displays a table with the following data:

Contract	Ship Type	Project
1 manpower		1
2 manpower		2
3 manpower		3

The 'Choose Drill Down' dialog box is open, showing a list of options. The 'Work Orders' option is selected and highlighted in blue. The other options in the list are: COA Sub Groups, COA Items, Design Package List, Cost Items, Cost Items - BOM, Cost Items - MEL, Planning Activities, Pallets, Pallet Items, Requisitions, and Requisition Items. The dialog box has 'OK' and 'Cancel' buttons at the bottom.

Now click on the *Drill-Down* button  on the tool bar and select *Work Orders* from the displayed list.

By using the *Add* button on the toolbar, begin adding project work orders in the Work Order Worksheet.

Contract	Project	Center	Work Order	Heading	Budgeted Labor Hours	Curve	Planned Start Date	Planned Finish Date
1 manpower	1	0	1	Fuel Oil Barge Labor Hour Plan	99,000.00	Curve 7: 50/50	02/25/2003	02/25/2004

## Required data for the work orders are the following:

1. Center
2. Work Order Number
3. Heading (desirable)
4. Budget Hours
5. Planned Start & Finish Dates

**The system will assume the labor hours will be spread evenly from start to finish unless the user selects a specific curve number to apply.**

# Manpower Curve

The curve number is optional and is used to define a particular time-phasing distribution of the work order labor hours over its planned duration, from planned start through planned finish dates.

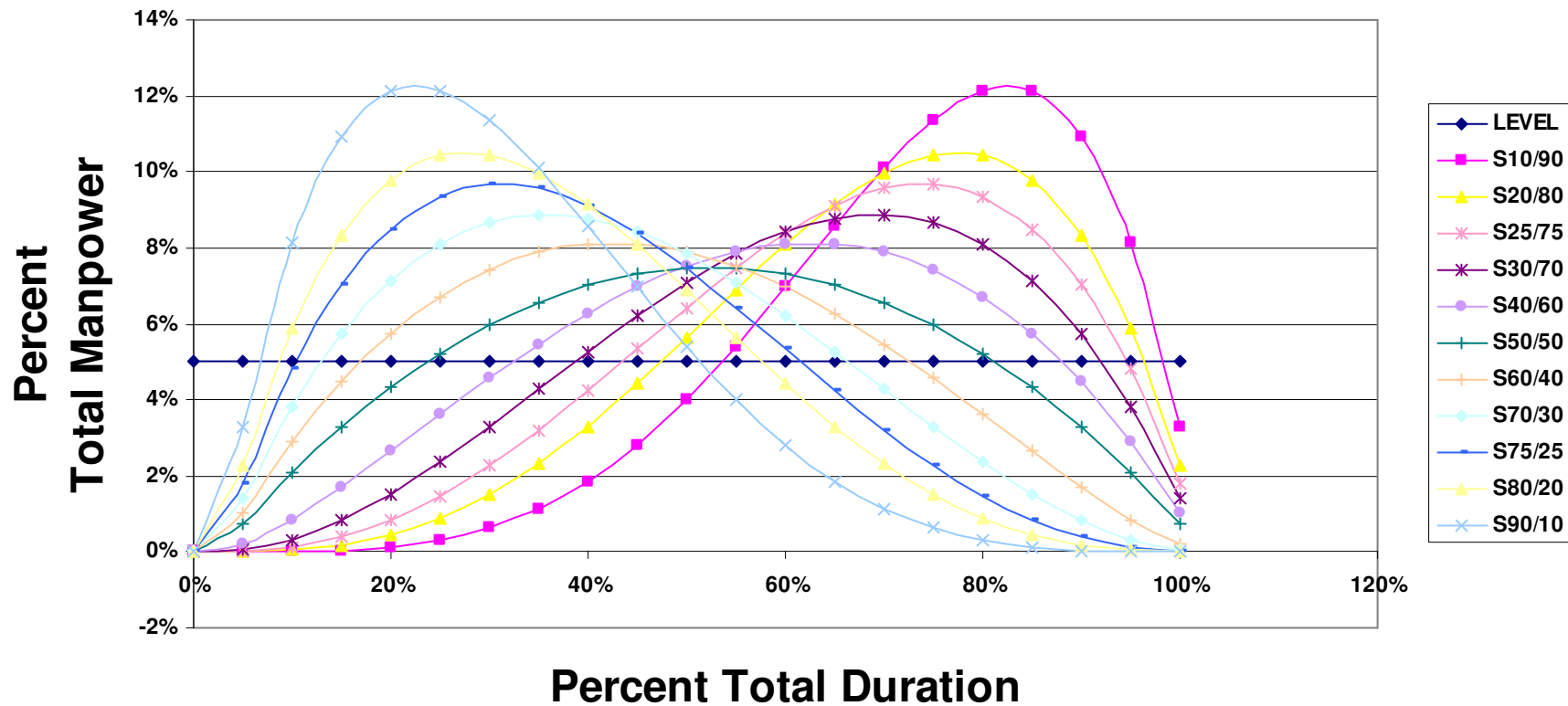
The *PERCEPTION* Manpower Analysis normally assumes that the man-hour budget for a work order is evenly distributed over its duration (no curve applied). However, the distribution curves provide a wide variety of other distribution functions that can more accurately model the planned rate of expenditures, especially for work orders that model relatively large amounts of work over a long period of time.

The manpower curves are described by the percentage of labor hours expended halfway through the planned duration.

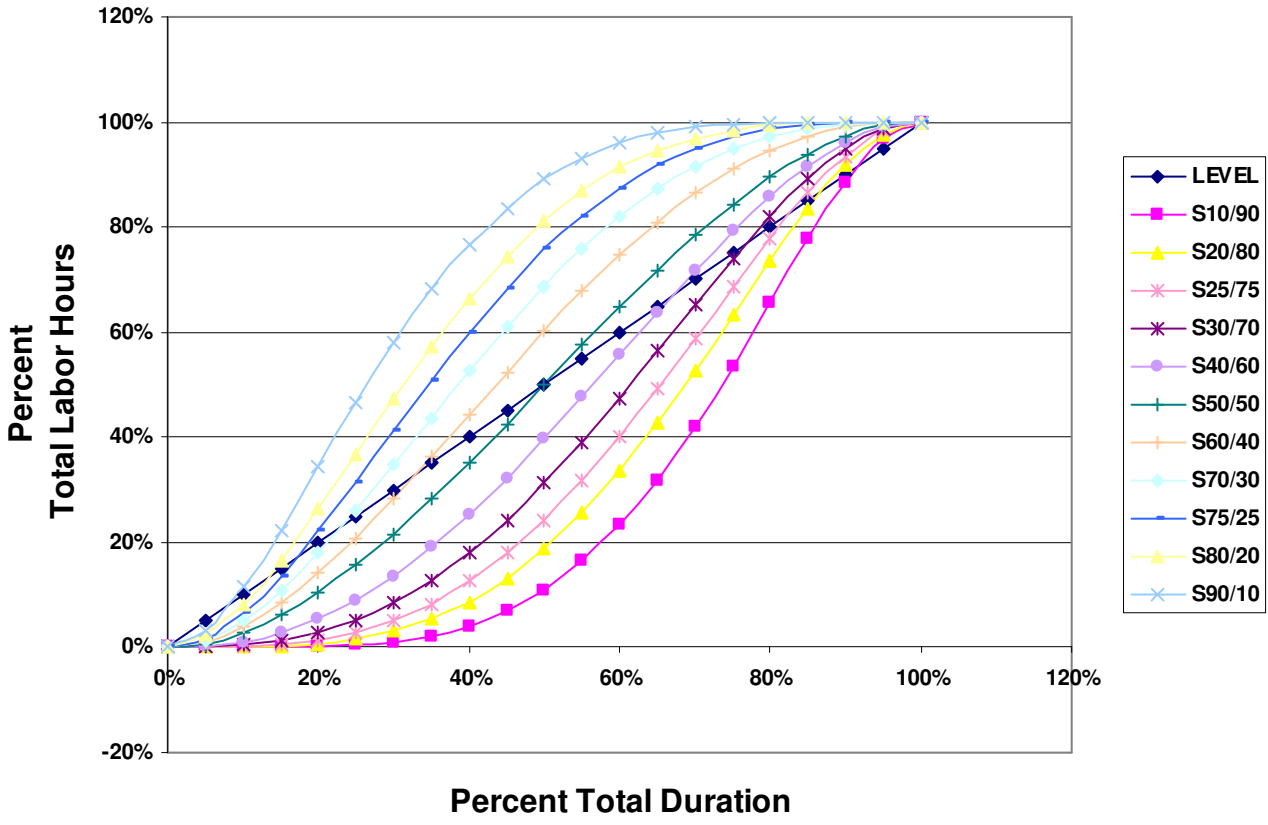
For example, curve #4 (just a sequence number for the curve) is described as 25/75. This curve distributes 25% of the budget hours over the first half of the work order schedule, and 75% over the last half of the schedule.

**The system assumes that the distribution curve applies not only to the total budget work order labor hours, but also to each individual trade assigned to that work order, and to the total budget labor cost.**

# Time-Phased Manpower Distribution Curves (Standard)




## Time-Phased Accumulative Labor Hour Distributions (Standard)



# Typical Distribution Curve Applications

Curve	Application
LEVEL	Services
10/90	Testing
20/80	Electrical Trades
30/70	Electrical Trades
40/60	Outfit Trades
50/50	Outfit Trades
60/40	Total Ship Curve
70/30	Engineering Trades
80/20	Steel Trades
90/10	Steel Trades

**With the above selections, it should be possible to model virtually all manpower loading requirements.**

When finished entering work orders for the project, save the work orders by clicking on the *Save* button  on the toolbar.

Define work orders in the same way for the remaining model projects, starting back at the Project Worksheet and drill-down to the Work Order Worksheet.

To view all work orders in the model (for all project work orders), go back to the Contract Worksheet and drill-down to work orders.

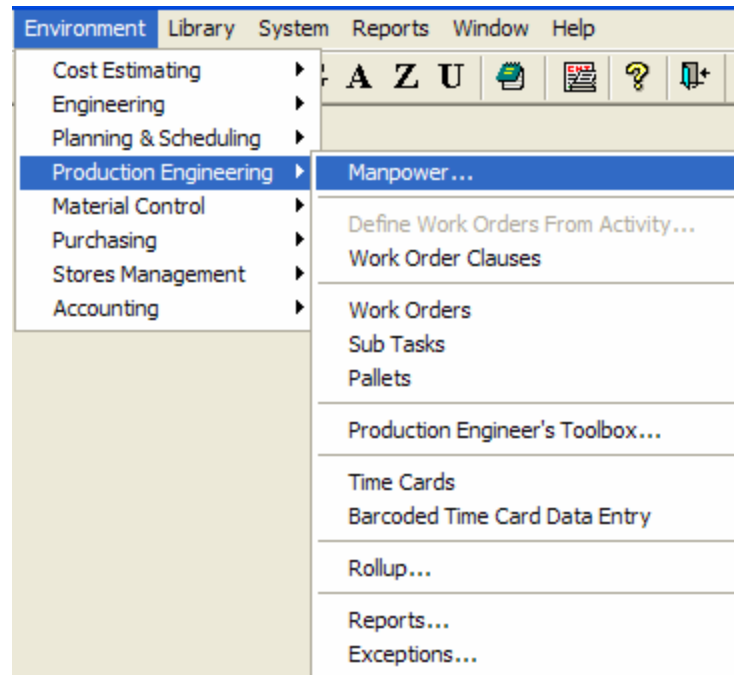
Work orders may also be defined in this worksheet after the drill down from the contract, but the user must then manually identify each project number.

	Contract	Project	Center	Work Order	Heading	Budgeted Labor Hours	Curve	Planned Start Date	Planned Finish Date
1	manpower	1	0	1	Fuel Oil Barge Labor Hour Plan	98,989.00	Curve 7: 50/50	02/25/2003	02/25/2004
2	manpower	2	0	1	Deck Barge	25,002.00	Curve 7: 50/50	02/25/2003	08/28/2003
3	manpower	3	0	1	Deck Barge	74,882.00	Curve 7: 50/50	05/28/2003	08/28/2004

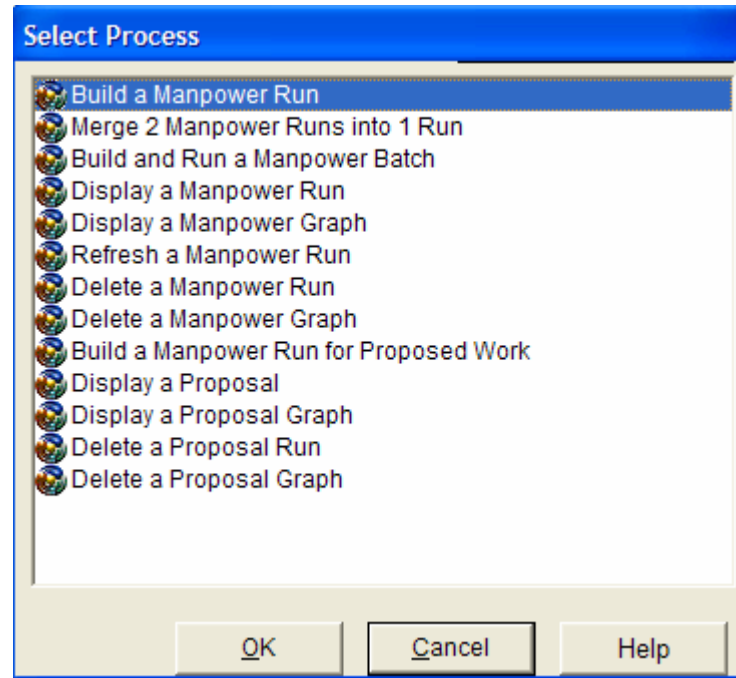
# Model Manpower Analysis

Once all of the model project work orders have been defined, a manpower analysis can be made for them.

Click on *Environment/Production Engineering/Manpower* from the main menu.



Select the process to *Build a Manpower Run*.



Click the *OK* button.

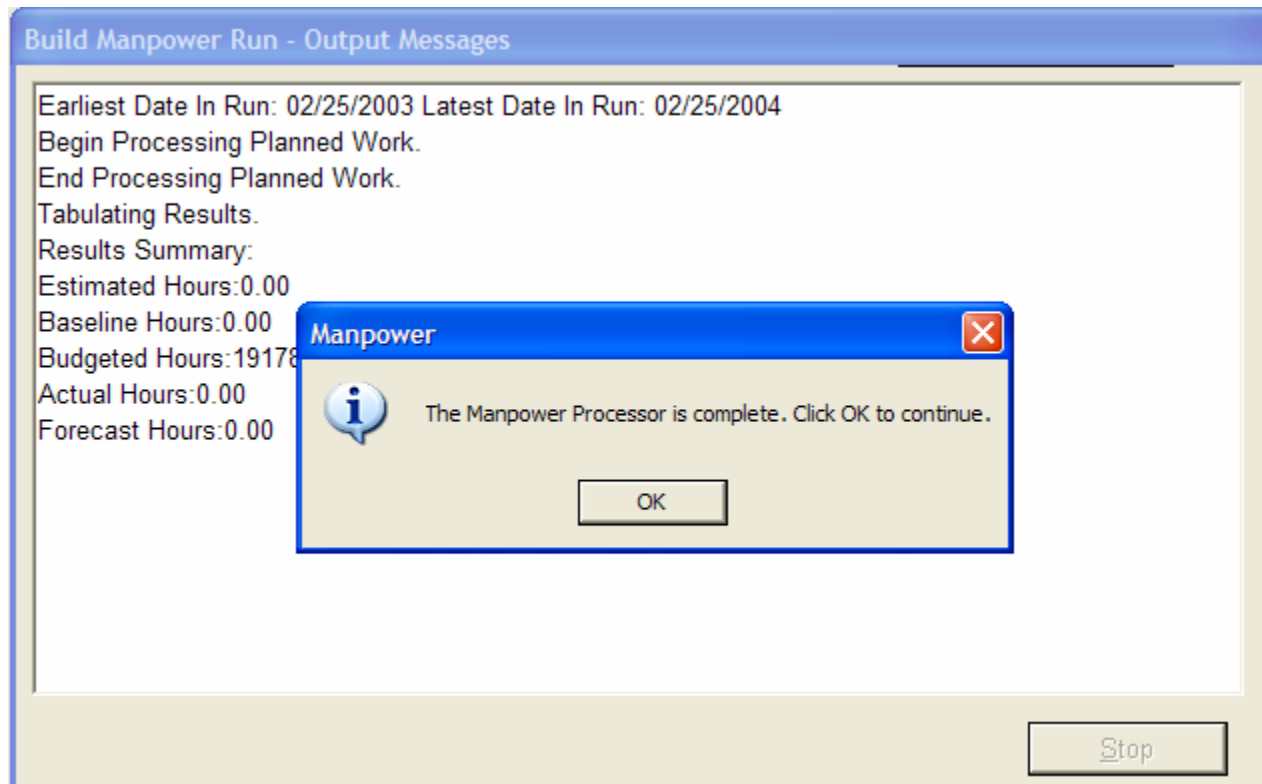
**In the set up window,**

- 1. Enter a unique Run Name**
- 2. Click on *Work Order Planned Budgets & Schedules***
- 3. Identify the model contract**
- 4. Click the *OK* button**

The screenshot shows the 'Build Manpower Run Setup' dialog box. It has a blue title bar and a light beige background. The dialog is divided into several sections:

- Manpower Options:** Contains a 'Run Name' text box with 'spar03/01/2003' and a 'Description' text box with '<Enter Description Of Manpower Run Here>'. A red arrow points to the 'Run Name' field.
- Elements To Analyze:** A group box containing five checkboxes:
  - Cost Estimate Hours & Schedules
  - Planning Activity Budgets & Schedules
  - Work Order Planned Budgets & Schedules (A red arrow points to this checkbox.)
  - Work Order Actual Hours & Schedules
  - Forecast Remaining Work Order Hours & Schedules
- Forecast Method:** Two radio buttons: 'Manual Forecast' (unselected) and 'System Forecast' (selected).
- Select the WBS To Forecast To:** A dropdown menu showing 'SWBS - Account'.
- Schedule Adjustments:** Two radio buttons: 'Revise Schedules' (unselected) and 'Maintain Schedules' (selected).
- WBS Selection Options:** A radio button 'Either Select the WBS Level to Process for This Run' is selected. Next to it is a dropdown menu showing 'Contract'. A red arrow points to this dropdown. Below it, the word 'Contract' is displayed, followed by a dropdown menu showing 'manpower', a text box with '1', and another dropdown menu. A second red arrow points to the 'manpower' dropdown. Below this is another radio button: 'Or, Use the Advanced Option to Select a WBS Range to Process >>'. At the bottom are three buttons: 'OK', 'Cancel', and 'Help'.

The system will begin its manpower process and when finished, click on the *OK* button.

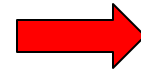
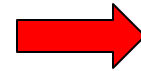


The system will display the results in a spreadsheet format.

Build Manpower Run Output for the Production Environment									
	Year	Quarter	Month	Week	Day	Hours Estimated	Hours Scheduled	Hours Planned	H
1	2003	1	2	9	3	0	0	1	
2	2003	1	2	9	4	0	0	1	
3	2003	1	2	9	5	0	0	1	
4	2003	1	2	9	6	0	0	0	
5	2003	1	3	9	7	0	0	0	
6	2003	1	3	10	1	0	0	0	
7	2003	1	3	10	2	0	0	95	
8	2003	1	3	10	3	0	0	95	
9	2003	1	3	10	4	0	0	95	
10	2003	1	3	10	5	0	0	95	
11	2003	1	3	10	6	0	0	95	
12	2003	1	3	10	7	0	0	0	
13	2003	1	3	11	1	0	0	0	
14	2003	1	3	11	2	0	0	95	
15	2003	1	3	11	3	0	0	95	
16	2003	1	3	11	4	0	0	95	
17	2003	1	3	11	5	0	0	95	
18	2003	1	3	11	6	0	0	95	
19	2003	1	3	11	7	0	0	0	
20	2003	1	3	12	1	0	0	0	
21	2003	1	3	12	2	0	0	95	
22	2003	1	3	12	3	0	0	95	
23	2003	1	3	12	4	0	0	95	
24	2003	1	3	12	5	0	0	95	
25	2003	1	3	12	6	0	0	95	
26	2003	1	3	12	7	0	0	0	
27	2003	1	3	13	1	0	0	0	
28	2003	1	3	13	2	0	0	95	
29	2003	1	3	13	3	0	0	95	
30	2003	1	3	13	4	0	0	95	

Click on the *Create Graph* button  on the toolbar.

1. Select the time frame granularity
2. Select *Work Order Planned Budgets & Schedules*
3. Select *Men* and *Distributions*
4. Enter a unique *Graph Name*
5. Finally, click the *OK* button



**Build Manpower Run - Graphical Tool**

Change Manpower Run Time Granularity

Daily  
 Weekly  
 Monthly  
 Quarterly  
 Yearly

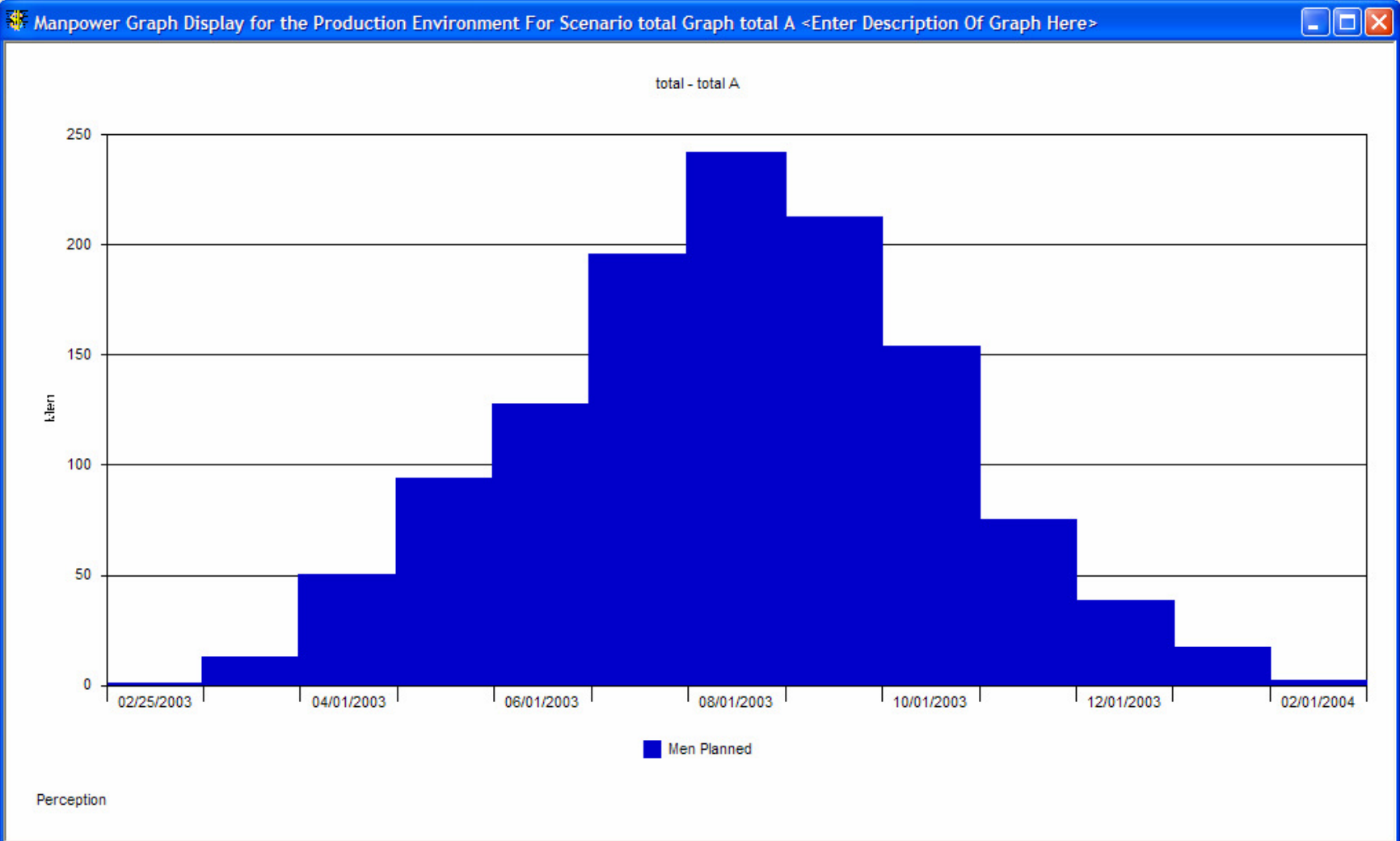
Choose Fields To Plot

Cost Estimate Hours & Schedules  
 Planning Activity Budgets & Schedules  
 Work Order Planned Budgets & Schedules  
 Work Order Actual Hours & Schedules  
 Work Order Remaining Hours & Schedules

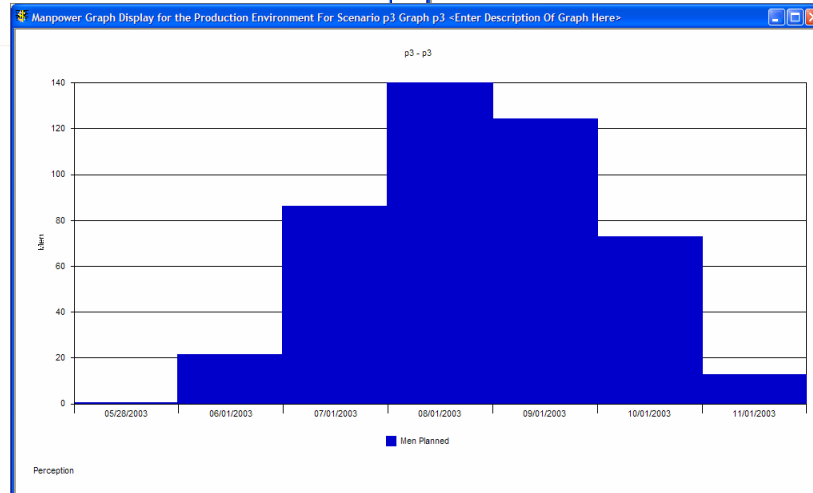
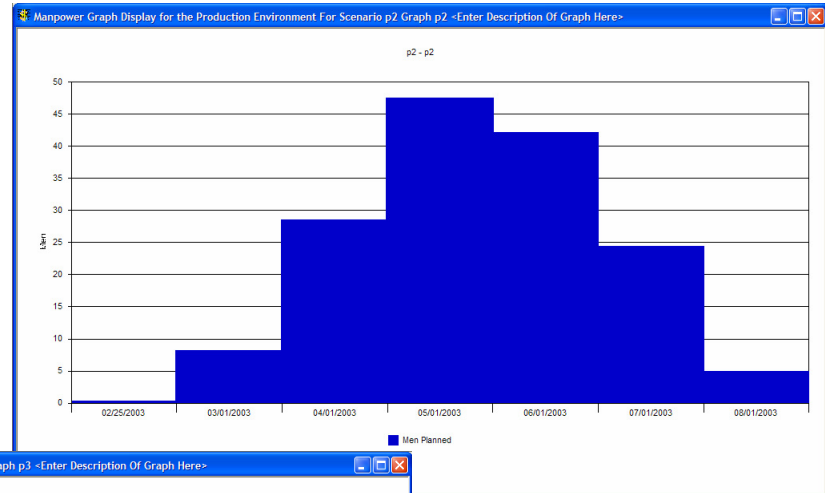
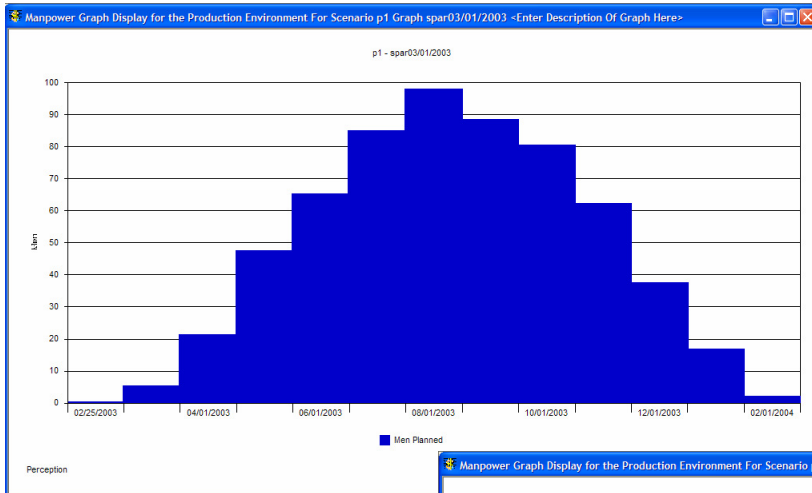
Graph Options

Men  
 Hours  
 Accumulative  
 Distributions

Graph Name



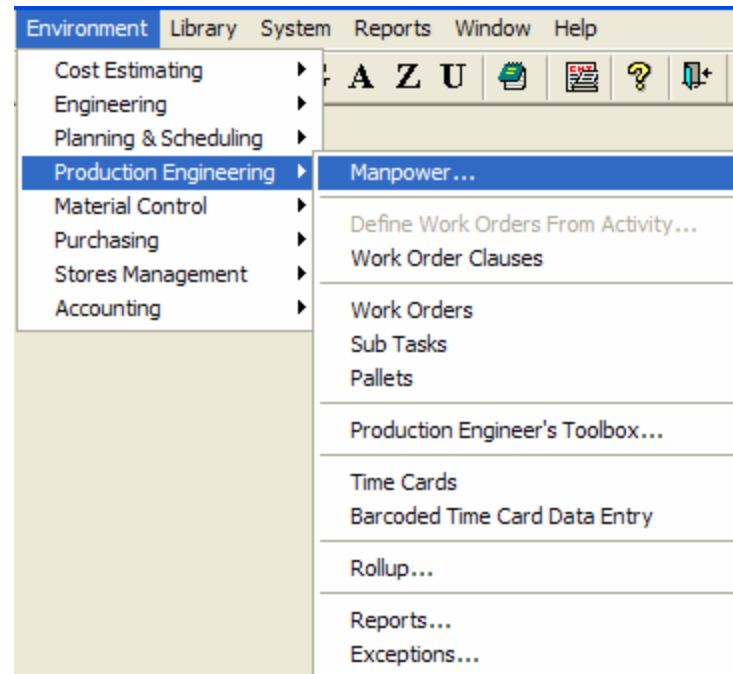
# The same procedure can be initiated to produce manpower requirements of individual projects:



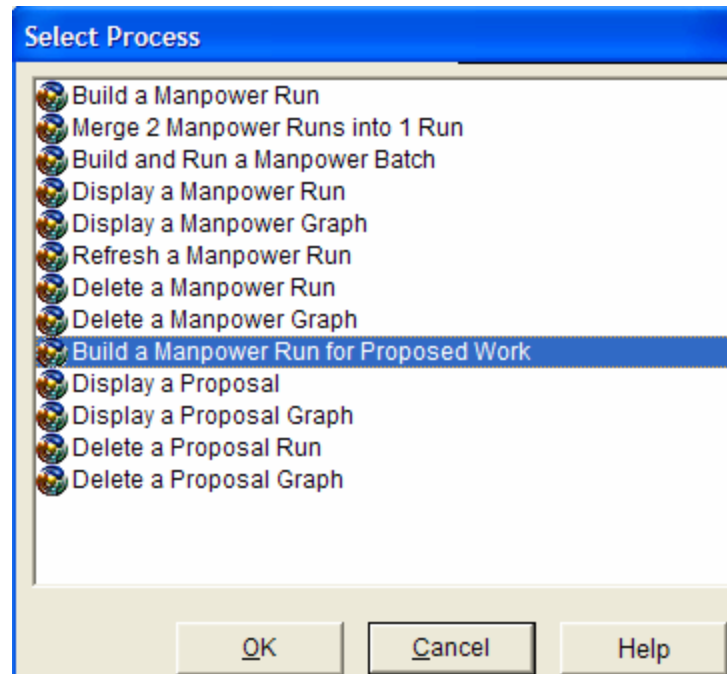
**Another format for this analysis is to do it as a Manpower Proposal**

**The Manpower Proposal will separately identify up to six project models in a stacked manpower display format.**

Click on *Environment/Production Engineering/Manpower* from the main menu.



Select the process to *Build a Manpower Run for Proposed Work*.



Click the *OK* button.

The window that the system displays is split into two sections.

**Build Proposed Manpower Facility**

Select the Active Projects to include in this Proposal

021	021	Mohegan
021	021L	Mohegan
022	022	Dry Dock
023	023	Barges Ur
023	023L	Contract L
026	026	Hughes 4
027	027	AGM Floa
027	027A	AGM 87x:
027	027B	AGM 40x:
027	027L	Contract L
028	028	Cashman

>> All >> << All <<

Remaining Work Order Hours and Schedules Will Be Forecast for Active Projects

Forecast Method  
 Manual Forecast  
 System Forecast

Select the WBS To Forecast To  
SWBS - Account

Schedule Adjustments  
 Revise Schedules  
 Maintain Schedules

Select the Proposed Projects to include in this proposal (Maximum 6 Proposed Projects)

036	036	Oil Barge
037	037	28,000 Ba
038	038A	Float A
038	038B	Float B
038	038C	Float C
MS 108	MS 108	SDS
MS 116	MS 116	Drydock C
MS 120	MS 120	Drydock E
MS 120	MS 120L	Contract L

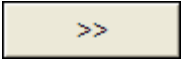
>> All >> << All <<

manpower 1 fuel oil barge  
manpower 2 deck barge  
manpower 3 deck barge


Select Data Source For Proposed Projects  
 Cost Items  Planning Activities  Work Orders

OK Cancel Help

The top section allows the user to identify all current projects in the backlog.

1. Identify one or more backlog projects by highlighting them.
2. Transfer them to the empty box at the right by clicking on the transfer button. 

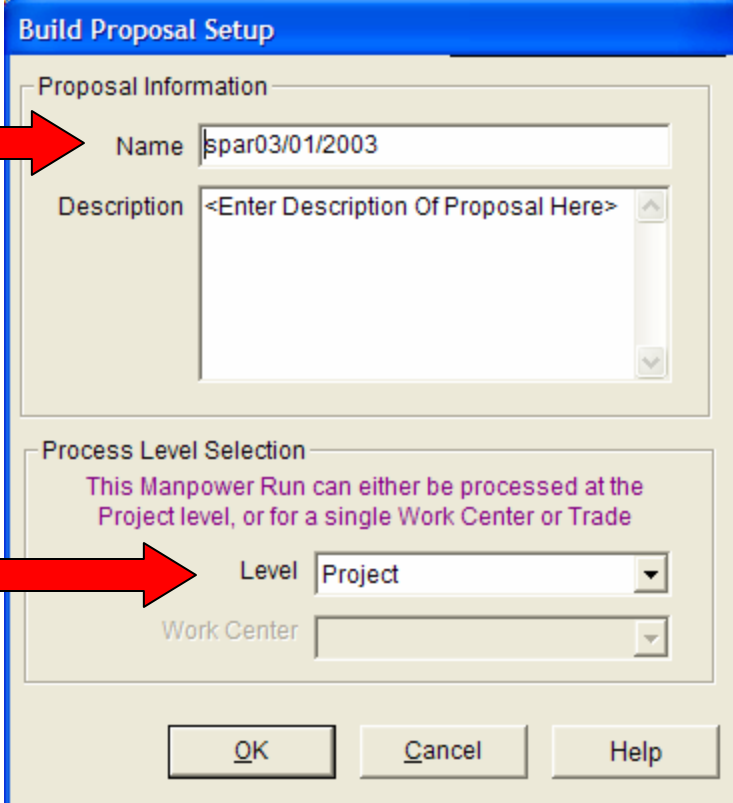
The bottom section allows the user to identify up to six proposed new work projects.

1. Identify one or more of these projects by highlighting them.
2. Transfer them to the empty box at the right by clicking on the transfer button. 

**Make sure that the Data Source for the proposed projects is set to *Work Orders*.**

**When the projects all have been selected, click on the *OK***

1. Enter a unique *Proposal Name*
  2. Select the level of the manpower analysis. Use the default level of *Project*.
- Click the *OK* button to continue.



The screenshot shows a dialog box titled "Build Proposal Setup". It is divided into two main sections: "Proposal Information" and "Process Level Selection".

- Proposal Information:** Contains a "Name" text box with the value "spar03/01/2003" and a "Description" text area with the placeholder text "<Enter Description Of Proposal Here>". A red arrow points to the "Name" field.
- Process Level Selection:** Contains a message: "This Manpower Run can either be processed at the Project level, or for a single Work Center or Trade". Below this is a "Level" dropdown menu set to "Project" and a "Work Center" dropdown menu. A red arrow points to the "Level" dropdown.

At the bottom of the dialog are three buttons: "OK", "Cancel", and "Help".

**The system initially will display the results in a spreadsheet format.**

# Manpower analysis results in spreadsheet format:

Build Proposals for the Production Environment											
	Proposal	Year	Quarter	Month	Week	Day	Combined Active	Proposed 1	Proposed 2	Proposed 3	Proposed 4
85	total stacked	2003	2	5	21	3	0	43.00	43.00	0	
86	total stacked	2003	2	5	21	4	0	43.00	43.00	0	
87	total stacked	2003	2	5	21	5	0	43.00	43.00	0	
88	total stacked	2003	2	5	21	6	0	43.00	43.00	0	
89	total stacked	2003	2	5	21	7	0	0	0	0	
90	total stacked	2003	2	5	22	1	0	0	0	0	
91	total stacked	2003	2	5	22	2	0	43.00	43.00	0	
92	total stacked	2003	2	5	22	3	0	43.00	43.00	0	
93	total stacked	2003	2	5	22	4	0	43.00	43.00	1.00	
94	total stacked	2003	2	5	22	5	0	43.00	43.00	1.00	
95	total stacked	2003	2	5	22	6	0	43.00	43.00	1.00	
96	total stacked	2003	2	5	22	7	0	0	0	0	
97	total stacked	2003	2	6	23	1	0	0	0	0	
98	total stacked	2003	2	6	23	2	0	65.00	42.00	21.00	
99	total stacked	2003	2	6	23	3	0	65.00	42.00	21.00	
100	total stacked	2003	2	6	23	4	0	65.00	42.00	21.00	
101	total stacked	2003	2	6	23	5	0	65.00	42.00	21.00	
102	total stacked	2003	2	6	23	6	0	65.00	42.00	21.00	
103	total stacked	2003	2	6	23	7	0	0	0	0	
104	total stacked	2003	2	6	24	1	0	0	0	0	
105	total stacked	2003	2	6	24	2	0	65.00	42.00	21.00	
106	total stacked	2003	2	6	24	3	0	65.00	42.00	21.00	
107	total stacked	2003	2	6	24	4	0	65.00	42.00	21.00	
108	total stacked	2003	2	6	24	5	0	65.00	42.00	21.00	
109	total stacked	2003	2	6	24	6	0	65.00	42.00	21.00	
110	total stacked	2003	2	6	24	7	0	0	0	0	
111	total stacked	2003	2	6	25	1	0	0	0	0	
112	total stacked	2003	2	6	25	2	0	65.00	42.00	21.00	

Click on the *Create Graph* button  on the toolbar.

1. Select the time frame granularity
2. Select the projects to include in the graphic report
3. Enter a unique Graph Name
4. Click the *OK* button to continue



**Build Proposal - Graphical Tool**

Change Manpower Run Time Granularity

Daily  
 Weekly  
 Monthly  
 Quarterly  
 Yearly

Select the Columns To Include in the Plot

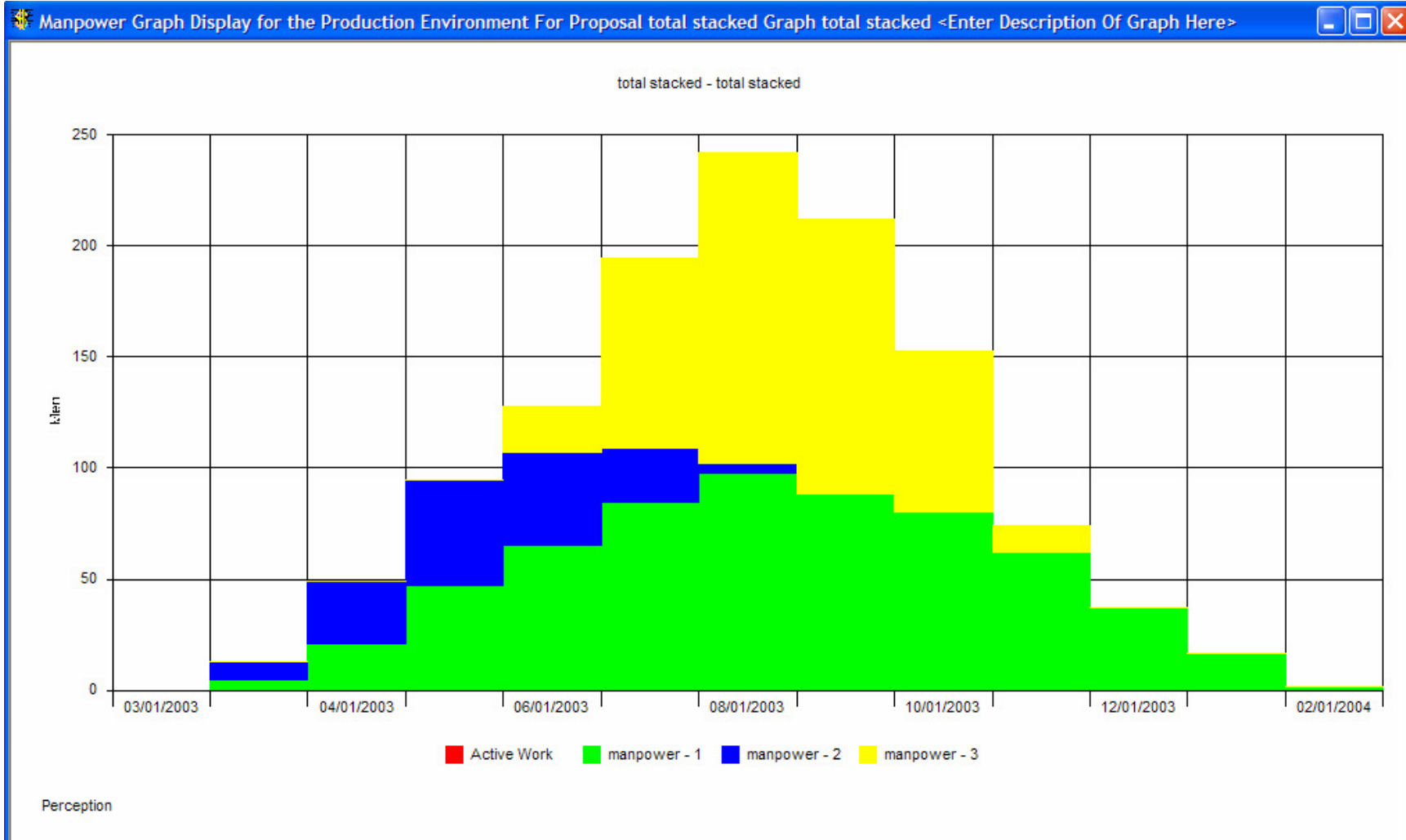
Series 1 - Active Work (Always Graphed)  
 manpower - 1  
 manpower - 2  
 manpower - 3  
 Proposed 4  
 Proposed 5  
 Proposed 6

Graph Options

Graph Name

<Enter Description Of Graph Here>

# Stacked project manpower chart.



# Modifying Manpower Models

**Project model work orders may be modified for both budget hours and schedules.**