

PERCEPTION[®] **WORK-PAC**

Defining a New Project

&

Work Orders

A Demo Training Tutorial

This training guide outlines the basic features of the *PERCEPTION* system for defining a shipyard project and work orders.

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

System Benefits

1. **Better labor planning cost/schedule control.**
2. **Improved management control of job progress and labor expenditures.**
3. **Immediate job cost reporting and summarization.**
4. **Fast and accurate reporting of labor cost problems.**
5. **Labor costing by project (job) work breakdown structure and by organization structure.**
6. **Automated final labor cost forecasting based upon actual performance.**
7. **Automated job progressing - no manual assessments required.**
8. **Generous checks for erroneous data and bad timecard charges.**

Special Note:

To add new records in any worksheet, click on the *Add* button on the toolbar  or the down-arrow on your keyboard.

To save data entered into any worksheet, click on the *Save* button  on the toolbar.

To delete records from any worksheet, highlight those records (rows) to be deleted, then click on the *Delete* button  on the toolbar.

To retrieve existing records from the database, click on the *Retrieve* button  on the toolbar.

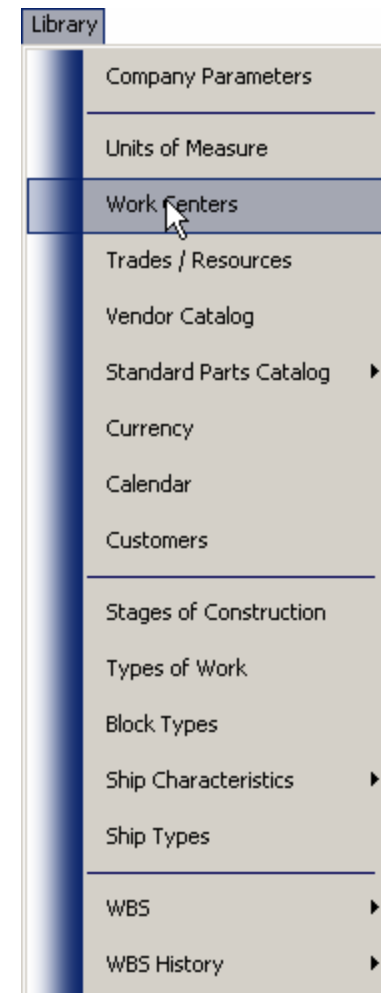
In order to plan and management labor using the system, the following must be set up on the system database:


- 1. Define all shipyard work centers. These will be assigned to work orders so that the system can report progress and performance by work center.**
- 2. Define all shipyard trades. These also may be assigned to work orders, but they also are assigned to employees so that the system can report manpower requirements and performance by trade.**
- 3. Define shipyard employees. This information is required for all time charges. The system processes time charges into project work orders.**

Once these steps have been done, these database files need to be maintained.

Defining Shipyard Work Centers

1. Click on Library on the main menu and
2. Select Work Centers to open the Work Center worksheet.



1. Click on the Add button  and enter the Work Center IDs and descriptions. Other information in this worksheet is optional.

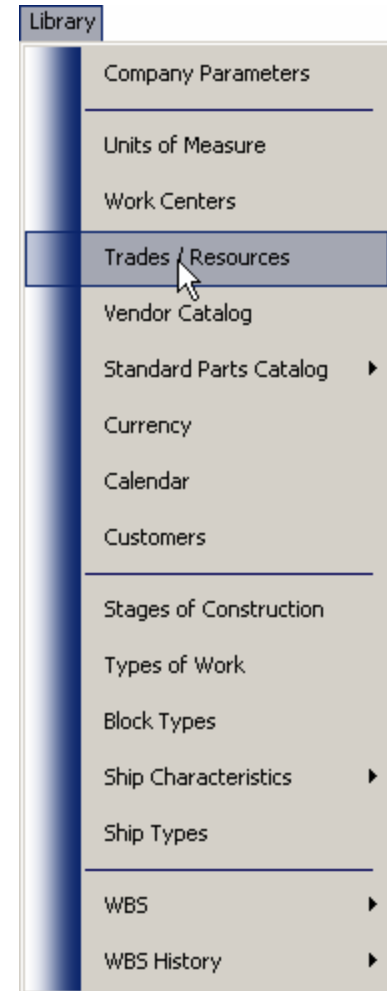
2. Click on the Save button 


3. Close the Work Center worksheet.

Work Center Information for the Production Environment	
Center	Description
21	Fabrication
32	Assembly Fit
43	Assembly Weld
54	Erection Fit
65	Erection Weld
76	PreOutfit
801	Hull Planking Shop
902	Mast & Rigging Shop
1003	Sail Loft
1104	Steel Weldout
1205	Mould Loft
1306	Material Control
1407	Planning & Control
1509	Drawing Office
1610	Production Services
1711	Carpenter's Shop
1815	Miscellaneous
1921	Joiner Shop
2022	Rigging Shop
2123	Outfit Shop
2224	Pipe Shop
2325	Machine Shop
2426	Electrical Shop
2527	Sheet Metal Shop
2628	Paint Shop
2736	Maintenance

Defining Shipyard Trades

1. Click on Library on the main menu and
2. Select Trades/Resources to open the trades worksheet.



1. Click on the Add button  and enter the Trade IDs and descriptions. The trade Type “H” indicates an hourly resource. Other information in this worksheet is optional.

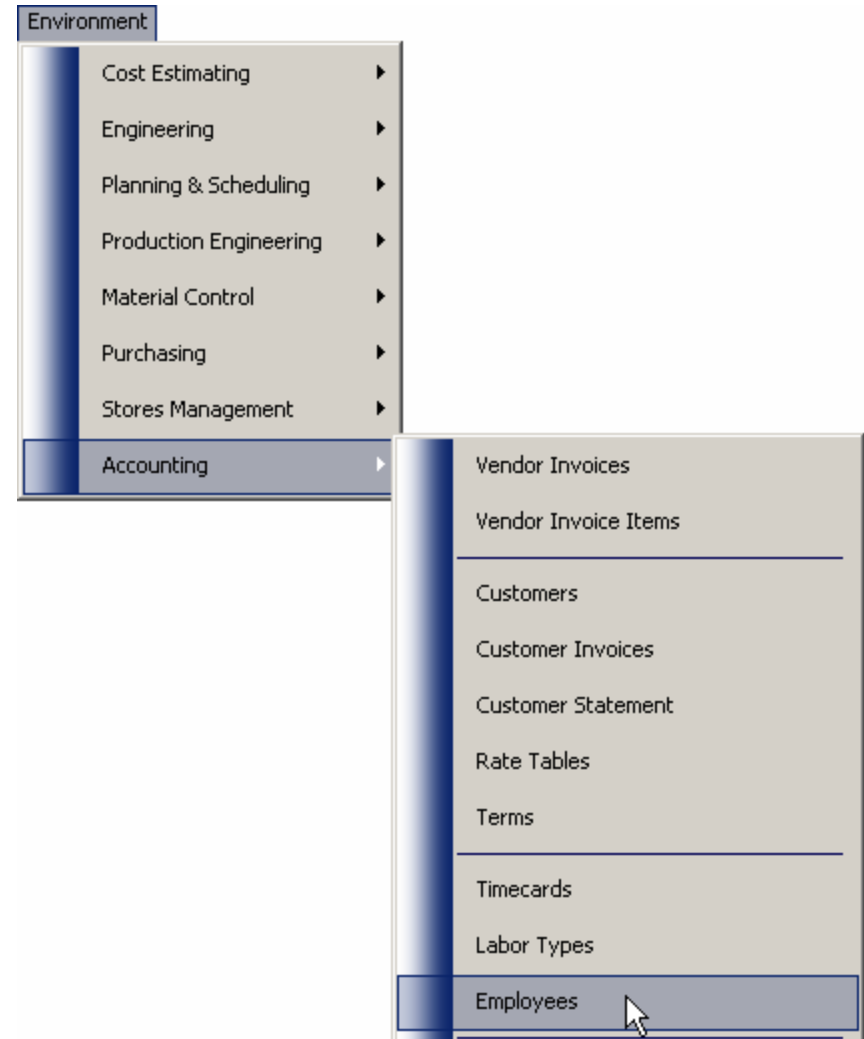
2. Click on the Save button 



3. Close the Work Center worksheet.

\$ Trade Information for the Production Environment			
	Trade ID	Type	Description
1	1	H	Carpenter Class I
2	2	H	Carpenter Class II
3	3	H	Carpenter Apprentice
4	4	H	Concrete Worker
5	5	H	Electrician
6	6	H	Electrician Apprentice
7	7	H	Plumber Class I
8	8	H	Plumber Class II
9	9	H	Painter
10	10	H	Painter Apprentice
11	11	H	Excavator
12	12	H	Carpet Layer
13	13	H	Iron Worker
14	14	H	Tile Setter
15	15	H	Heating/AC Worker
16	16	H	Drape Hanger
17	17	H	Cabinet Maker
18	18	H	Cabinet Maker Apprentice
19	19	H	Laborer
20	20	H	Center Manager
21	21	H	Pipe Worker
22	22	H	Pipe Worker Apprentice
23	51	H	Marine Steel Fitter
24	61	H	Marine Engine Fitter
25	71	H	Carpenter
26	72	H	Painter / Blaster

Defining Shipyard Employees

1. Click on Environment on the main menu and
2. Select Accounting
3. Select Employees to open the Employee Data worksheet.



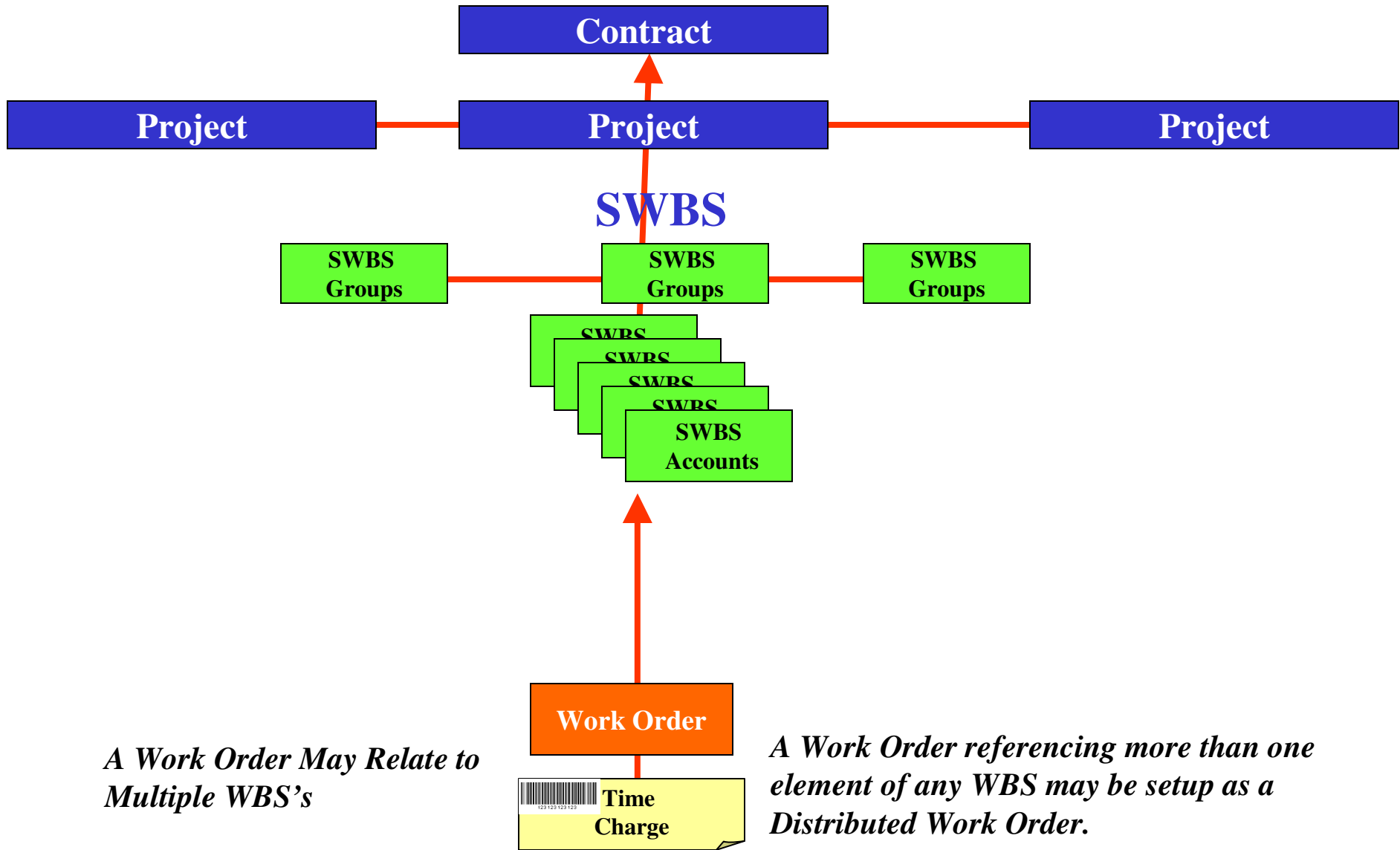
1. Click on the Add button  and enter the Employee IDs, names, etc. The user manual describes the various other information that can be defined in this
2. Click on the Save button 
3. Close the Employee worksheet.

\$ Employee Information for the Accounting Environment										
Employee ID	Name	Home Trade	Home Center	Rate	Status	Manager	Buyer	Allow Time Entry	Badge Num	Charge Hand
1A	Demo	Demo	Spar Center	10.00	Active	No	No	Yes	A	No
29	W. Jackson	1	Pre-Move Hur	16.52	Active	No	No	Yes	9	No
38	J. Davis	1	Framing/Gener	16.52	Active	No	No	Yes	8	No
47	B. Davis	1	Indoor/Outdo	16.52	Active	No	No	Yes	7	No
56	D. Marshall	20	Pre-Move Hur	16.52	Active	No	No	Yes	6	No
65	D. Edwards	20	Indoor Humar	16.00	Active	No	No	Yes	5	No
744	T. Marshall	11	Indoor/Outdo	10.00	Active	No	No	Yes	44	No
843	L. Obinawa	11	General Setup	10.00	Active	No	No	Yes	43	No
942	T. Micheals	11	General Setup	10.00	Active	No	No	Yes	42	No
1041	L. Jenni	11	General Setup	10.00	Active	No	No	Yes	41	No
1140	P. Gaugan	9	Pre-Move Hur	0.00	Active	No	No	Yes	40	No
124	G. Morrison	20	Framing/Gener	5.00	Active	No	No	Yes	4	No
1339	L. Denkins	8	Indoor Humar	16.00	Active	No	No	No	39	No
1422	M. Keate	8	General Setup	0.00	Active	No	No	Yes	22	No

Starting a New Contract

At a minimum, a contract must have the following:

1. A Contract ID defined.
2. A Project ID defined (there may be more than one project per contract).
3. The Project WBS as defined by SWBS Groups and SWBS Accounts under the Groups. Other WBS structures are optional.
4. The Project Work Orders assigned to Project Work Centers and SWBS Accounts.



PERCEPTION operates under different environments:

- 1. Estimating**
- 2. Planning & Scheduling**
- 3. Production Engineering**
- 4. Material Control**
- 5. Purchasing**
- 6. Stores Management**
- 7. Accounting**

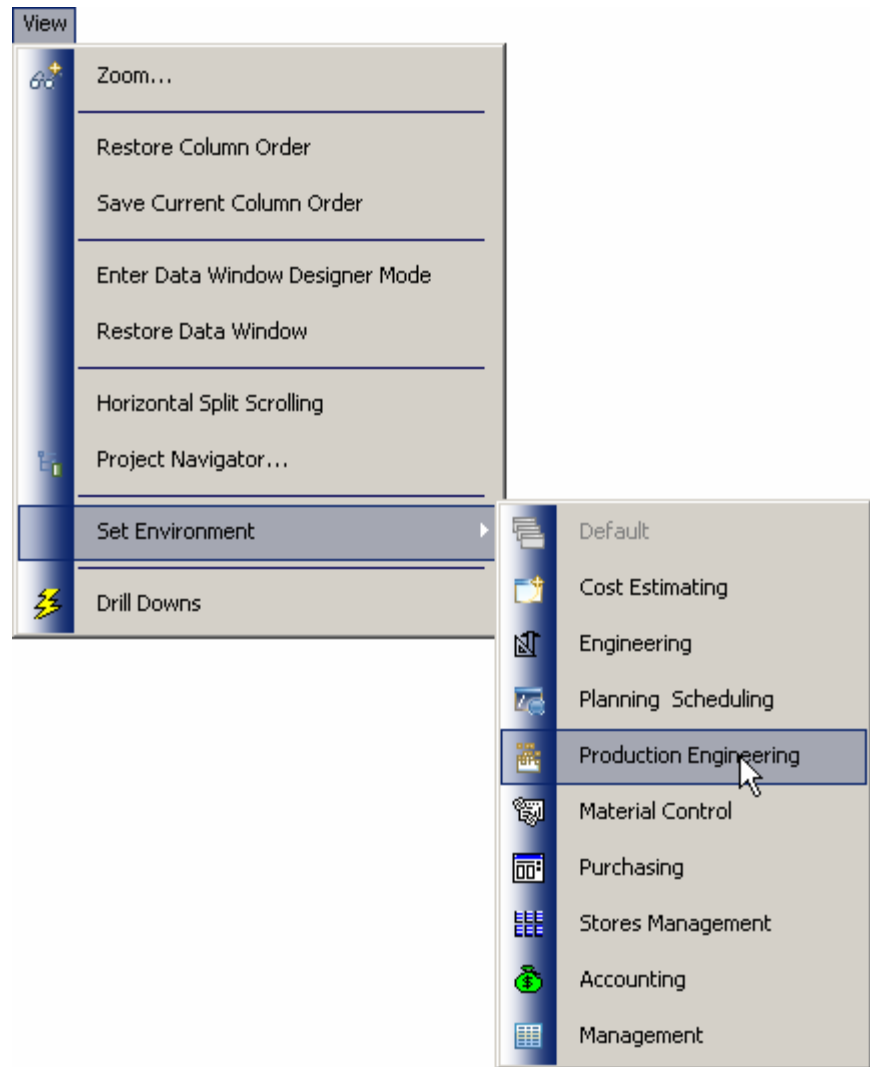
Each environment focuses on a general shipyard business function. Users are assigned to one or more environments.

New contracts, their WBS & Work Orders can be defined in the following environments:




- 1. Estimating**
- 2. Planning & Scheduling**
- 3. Production Engineering**
- 4. Accounting**

To create work orders for the contract, set the environment to Production Engineering.

- Click on View in the main menu,
- Select Set Environment and
- Select Production Engineering.




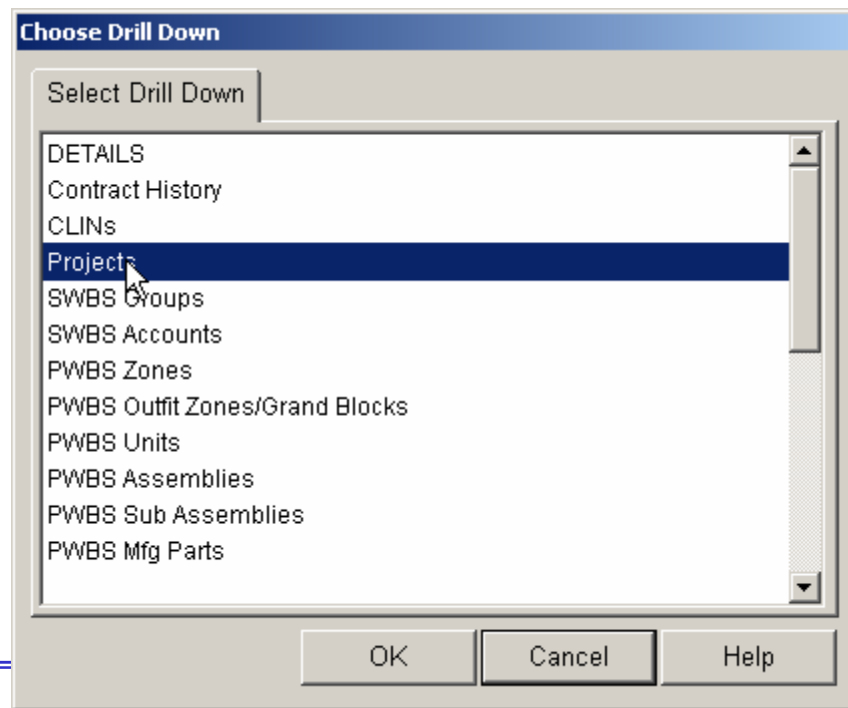
Defining the New Contract:

1. Click on the C-button  on the tool bar to open the contract worksheet.
2. Click on the Add button  and enter the Contract ID and description.
3. Click on the Save button  .

\$ Contract Information for the Estimating Environment				
	Contract	Description	Customer	Manager
1	SAMPLES	Sample Projects	Fast-Cat Ferries	

Defining the Project(s) within the Contract:

1. Click on the contract row to highlight it.
2. Click on the Drill-down button  and select Projects to open the Project worksheet.




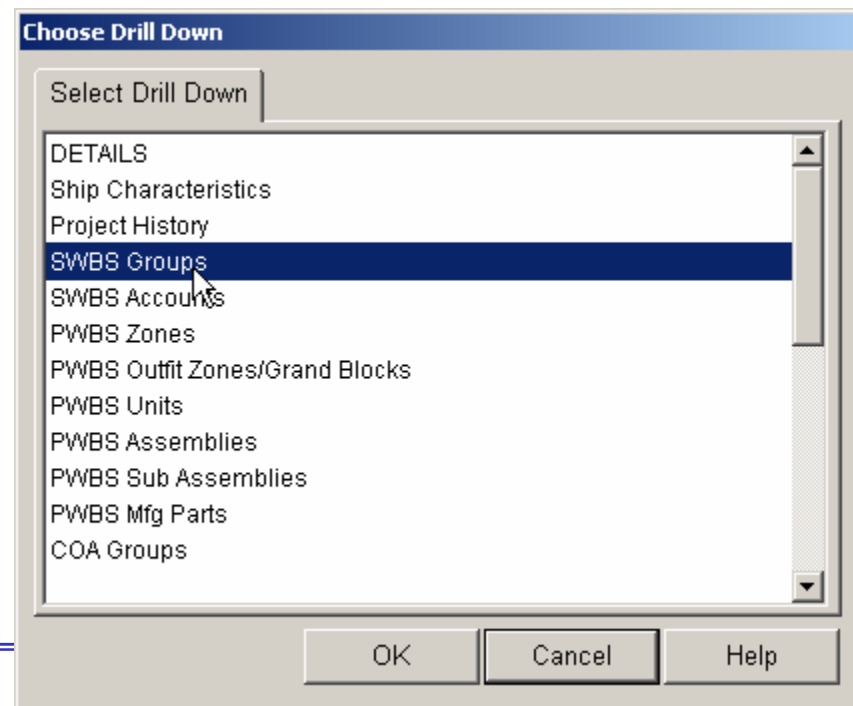
1. Click on the Add-button and for each project define the project ID and its description. Other information in the worksheet are optional.
2. Click on the Save button.

Project Information for the Estimating Environment			
	Contract	Ship Type	Description
1	SAMPLES	CG-WPB	46mPB 46 Meter CG Patrol Boat

Note that the Contract ID, because of the drill-down features, is automatically assigned to the project.

Defining the Project Work Breakdown Structure (WBS):

1. Click on the Project row to highlight it.
2. Click again on the Drill-down button  and select SWBS Groups to open the SWBS Group worksheet.



1. Click on the Add-button and for each SWBS Group define the SWBS Group ID and its description. Other information in the worksheet are optional.
2. Click on the Save button

\$ SWBS Group Information for the Estimating Environment				
	Contract	Project	Group	Description
1	SAMPLES	46mPB	1	Structures
2	SAMPLES	46mPB	10	Fees & Insurance
3	SAMPLES	46mPB	2	Propulsion
4	SAMPLES	46mPB	3	Electrical
5	SAMPLES	46mPB	4	Electronics & Navigation
6	SAMPLES	46mPB	5	Auxillary Systems
7	SAMPLES	46mPB	6	Outfit & Furnishings
8	SAMPLES	46mPB	7	Armament
9	SAMPLES	46mPB	8	Technical.Support
10	SAMPLES	46mPB	9	Shipyard Services

Note that the Contract ID and the Project Number, because of the drill-down features, are automatically assigned to the SWBS Groups.

Defining the Project SWBS Accounts:

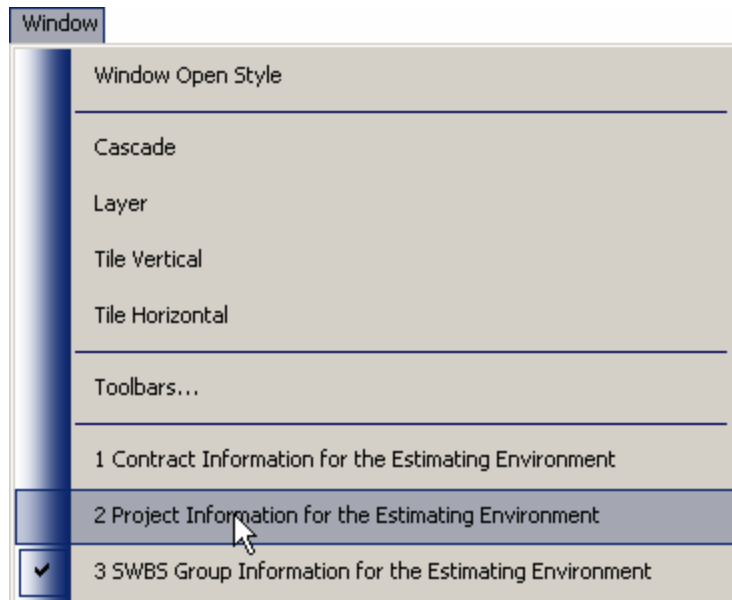
By the same procedure, you can drill down each SWBS Group (highlight it first) and define the various SWBS Accounts under the group.

An easier method for defining the SWBS Accounts is to re-open the Project worksheet and drill-down from the project to the SWBS Accounts. This may be an easier set of steps where all SWBS Accounts can be defined together. The system will automatically assign them to the proper SWBS Group.

This alternate method for defining SWBS Accounts assumes that the Accounts are based on a 3-digit numbering scheme, where the SWBS Group number is the leading digit of the SWBS Account number.

Other numbering schemes can be implemented as described in the user manual.

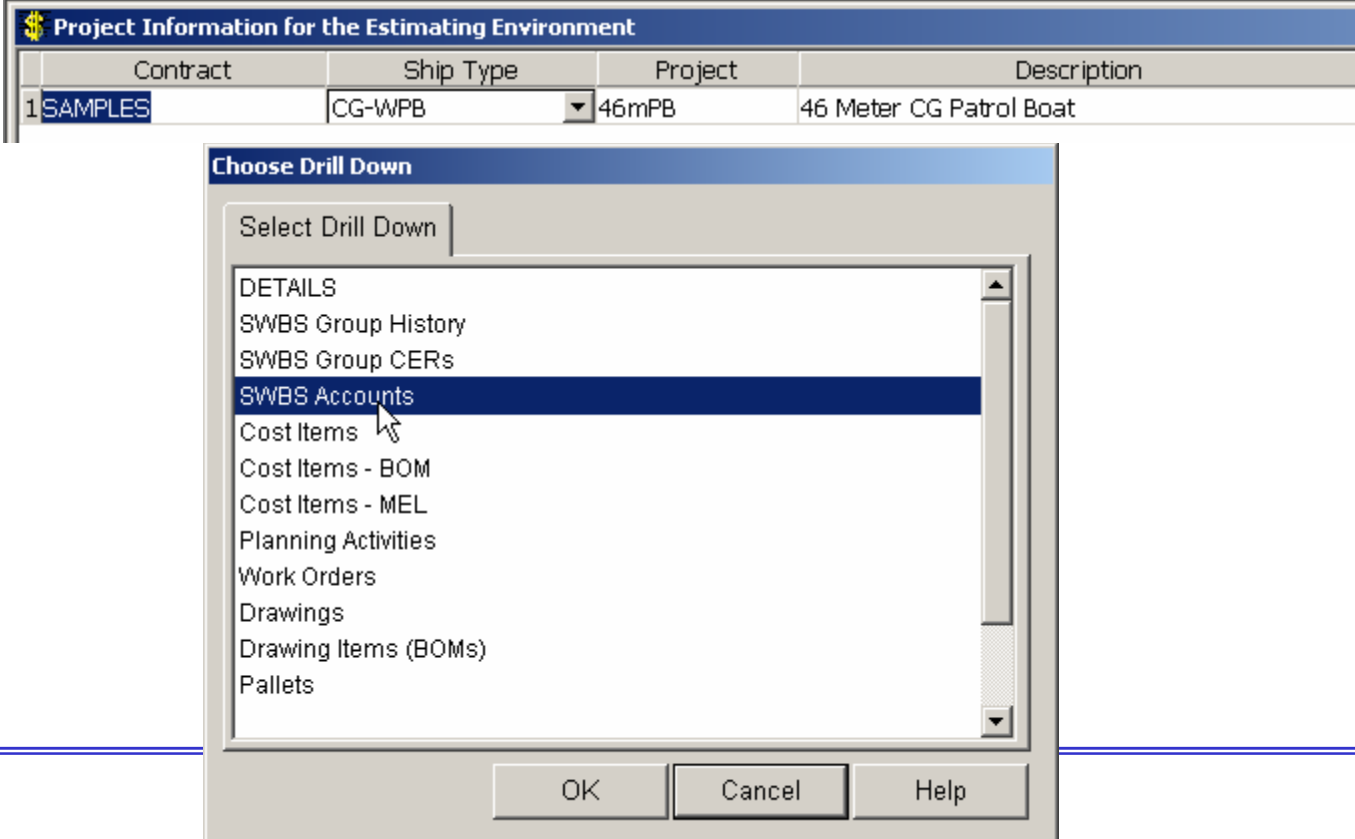
To re-open any window not closed, click on Window on the main menu and select which window to re-open.



Defining the Project SWBS Accounts:

Click on the project row to highlight it.

Click again on the Drill-down button  and select SWBS Accounts to open the SWBS Account worksheet.



The screenshot displays a software interface with a table titled "Project Information for the Estimating Environment". The table has four columns: Contract, Ship Type, Project, and Description. The first row is highlighted, showing "1 SAMPLES", "CG-WPB", "46mPB", and "46 Meter CG Patrol Boat". Below the table, a "Choose Drill Down" dialog box is open, listing various options. "SWBS Accounts" is selected and highlighted in blue. The dialog box also includes "OK", "Cancel", and "Help" buttons at the bottom.

Contract	Ship Type	Project	Description
1 SAMPLES	CG-WPB	46mPB	46 Meter CG Patrol Boat

Choose Drill Down

Select Drill Down

- DETAILS
- SWBS Group History
- SWBS Group CERs
- SWBS Accounts**
- Cost Items
- Cost Items - BOM
- Cost Items - MEL
- Planning Activities
- Work Orders
- Drawings
- Drawing Items (BOMs)
- Pallets

OK Cancel Help

1. Click on the Add-button and for each SWBS Account define the SWBS Account ID and its description. Other information in the worksheet are optional.
2. Click on the Save button

SWBS Account Information for the Production Environment						
	Contract	Project	Group	Account	Description	F
53	SAMPLES	46mPB	3	314	Electrical Generation	
54	SAMPLES	46mPB	3	316	Miscellaneous Electrical	
55	SAMPLES	46mPB	4	400	Electronics & Navigation	
56	SAMPLES	46mPB	4	402	Exterior Communications	
57	SAMPLES	46mPB	4	404	Interior Communications	
58	SAMPLES	46mPB	4	406	Navigation	
59	SAMPLES	46mPB	4	408	Misc	
60	SAMPLES	46mPB	5	500	Auxiliary Systems	
61	SAMPLES	46mPB	5	502	HVAC	
62	SAMPLES	46mPB	5	504	Engine Room Piping Systems	
63	SAMPLES	46mPB	5	506	Cargo Piping Systems	
64	SAMPLES	46mPB	5	508	Fire Protection Systems	
65	SAMPLES	46mPB	5	510	Habitation Piping & Services	
66	SAMPLES	46mPB	5	512	Deck Machinery	
67	SAMPLES	46mPB	5	514	Stabilizer Machinery	
68	SAMPLES	46mPB	6	600	Outfit & Furnishings	
69	SAMPLES	46mPB	6	602	Exterior Coatings	
70	SAMPLES	46mPB	6	604	Interior Coatings	
71	SAMPLES	46mPB	6	606	General Hull Outfit:	
72	SAMPLES	46mPB	6	608	Rescue & Life Saving Equipment	
73	SAMPLES	46mPB	6	610	Fire Fighting & Pollution Controls	

Note that the Contract ID, the Project Number, and the SWBS Group ID, because of the drill-down features, are automatically assigned to the SWBS Accounts.

Special Note 1: The user manual describes other functions that will copy WBS structures from one project to another.

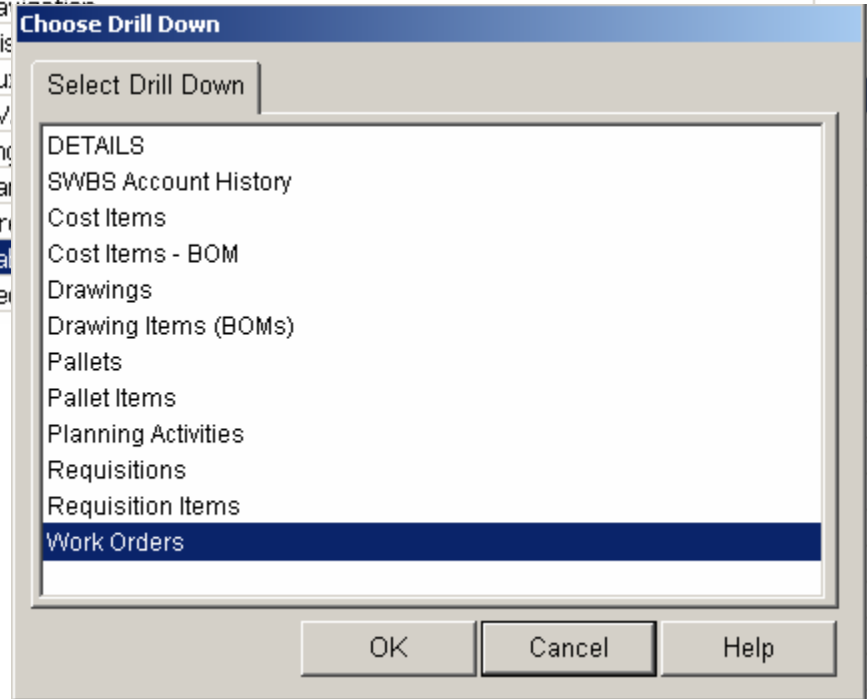
Special Note 2: The user manual describes how to paste into any system worksheet data from outside the system such as Microsoft Excel.

There are special requirements to ensure that the user sets the column order of the system worksheet to be the same as the column order of the incoming data being pasted.

Defining Work Orders

In the SWBS Account worksheet,

SWBS Account Information for the Production Environment					
	Contract	Project	Group	Account	Description
56	SAMPLES	46mPB	4	402	Exterior Communications
57	SAMPLES	46mPB	4	404	Interior Communications
58	SAMPLES	46mPB	4	406	Navigation
59	SAMPLES	46mPB	4	408	Miscellaneous
60	SAMPLES	46mPB	5	500	Autonomous
61	SAMPLES	46mPB	5	502	HVAC
62	SAMPLES	46mPB	5	504	Engineering
63	SAMPLES	46mPB	5	506	Construction
64	SAMPLES	46mPB	5	508	Furniture
65	SAMPLES	46mPB	5	510	Hardware
66	SAMPLES	46mPB	5	512	Decorative



1. Click on the SWBS Account row to highlight it.
2. Click again on the Drill-down button and select Work Orders to open the Work Order worksheet.



1. Click on the Add-button and for each Work Order define Work Order ID, its Work Center and its description. Other information in the worksheet are optional. However, budget labor hours and planned start/finish dates should be defined.
2. Click on the Save button

Work Orders Information for the Production Environment								
	Contract	Project	Center	Work Order	Heading	Budgeted Labor Hours	Planned Start Date	Planned Finish Date
1	SAMPLES	46mPB	SY	510.8	Garbage Disposal System - Ship's Comple	103.95	11/01/2007	01/23/2008
2	SAMPLES	46mPB	SY	510.7	Sewage Treatment System - Ship's Comple	103.95	11/01/2007	01/23/2008
3	SAMPLES	46mPB	SY	510.2	Officers' Quarters: Plumbing & Scuppers	891.00	12/27/2007	12/27/2007
4	SAMPLES	46mPB	SY	510.3	NCO Quarters: Plumbing & Scuppers	868.73	12/28/2007	12/28/2007
5	SAMPLES	46mPB	SY	510.4	Enlisted Quarters: Plumbing & Scuppers	2,120.58	12/31/2007	12/31/2007
6	SAMPLES	46mPB	SY	510.6	Distiller (drinking water) Equipment - S	31.19	11/01/2007	01/23/2008

Note: columns can be re-arranged by placing the cursor on the column heading, holding down the left mouse, and dragging the column to where you want it positioned.

A detail Work Order Data window can be accessed by double-clicking on any work order row number.

Work Order Details Information for the Production Environment									
Details		Sub Tasks		Trades		Pallets		Pallet Items	
Contract	SAMPLES	Project	46mPB	Heading	NCO Quarters: Plumbing & Scuppers			Issue Date	
Center	SY	Work Order	510.3	Description	NCO Quarters: Plumbing & Scuppers			00/00/0000	
IPT		Planner		Foreman				Revision	
Division		Shop		Center		Drawing		Rev Date	00/00/0000
								Planned	Actual
Supervisor		Qty	3.00		0.00	Planned	12/28/2007	12/28/2007	Finish Date
Zone		Labor CER	292.50	UoM		Actual	00/00/0000	00/00/0000	
Outfit Zone		Labor Rate	20.08	PERS		Date of Last Charge	00/00/0000	00/00/0000	
Unit/Block		Hours		Cost		Budget Material \$	23,793.99		
Assembly		Budget	868.73		19,381.26	Actual Material \$	0.00		
Sub Assembly		Actual	0.00		0.00	Product Code			
MFG Part		Rework	0.00		0.00	WO Type	Discrete		
SWBS Group	5	Premium	0.00		0.00	Manpower Curve			
SWBS Account	510	After Close	0.00		0.00	Authorization	NOT Authorized		
CLIN		Estimated to Complete			0.00	Rework Status	NOT a Rework WO		
Activity Center	SY	Manual Progress	0.00	%		Pallet Budgeted Hours	0.00		
Planning Activity	510.3	Change Order ID				Work Order Serial Number	4112		

Note the window tabs:

Work Order Details Information for the Production Environment					
Details	Sub Tasks	Trades	Pallets	Pallet Items	
Contract	SAMPLES	Project	46mPB	Heading	NCO Quarters: Plumbing & Scuppers
Issue Date					
Center	SY	Work Order	510.3	Description	NCO Quarters: Plumbing & Scuppers
					00/00/0000
IPT		Planner		Foreman	
					Revision

Sub Tasks are used for the special Time-Phased and Distributed Work Orders that are described in the user manual.

- **Trades offer the ability to breakdown the labor hour budget by specific shipyard trade or craft.**
- **Pallet & Pallet Items offers the ability to define a list of bills of material for the work order. A work order may be assigned to multiple pallets**

The work order has both a heading (short 40-characters) and a long description (essentially unlimited text).

The heading is used in all the work order listing reports.

The long description is printed on the optional formal work order “ticket” that can be generated and issued to production.

If a heading is not entered by the user, the system defaults the heading to be the first 40-characters of the long description.

Special Note 1: The user manual describes other functions that will copy work orders from one project to another.

Special Note 2: The user manual describes how to paste into any system worksheet data from outside the system such as Microsoft Excel.

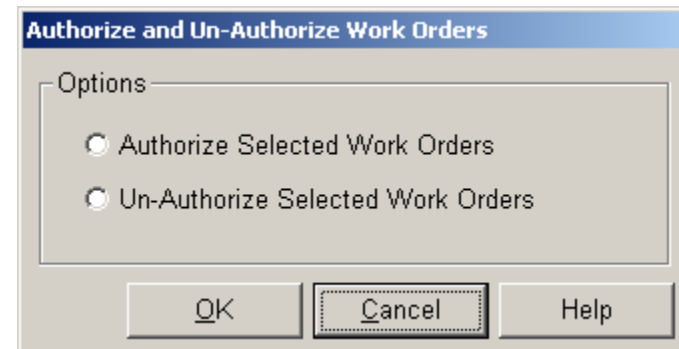
There are special requirements to ensure that the user sets the column order of the system worksheet to be the same as the column order of the incoming data being pasted.

Authorizing Work Orders

Before any time charges can be accepted by the system against any type of work order, the work order must be authorized.

To authorize work orders, select them from the Work Order worksheet and click on the *Authorize/Un-authorize* button  on the tool bar.

Select *Authorize Selected Work Orders* from the pop up window.



Work orders that have been authorized, can be reset to un-authorized status by selecting the *Un-Authorize Selected Work Orders* from the pop up window.

This operation will cause the system to reject any time charges made against an un-authorized work order.

Work Order Tickets

Work Order Tickets are printed reports of the work order that can be issued directly to production.

The user can choose to send the work tickets directly to the printer, or can first review the ticket on the screen if desired, and then either print or not print them as he chooses.

Although tickets can be customized for a given system installation, the ticket itself generally may consists of four pages.

- 1. The first page is an overall description (heading) of the work order, its total budget and breakdown of budget by planned trades.**
- 2. The second page provides the detail description (work instructions) of the work order.**
- 3. The third page lists the work order pallet bill of material (if defined)**
- 4. The fourth page prints the AutoCAD drawing if the drawing file name has been added to the work order record.**


Tickets may be displayed/printed using the work order *Issue/Un-Issue* button  on the toolbar.

However, tickets also may be printed using the *Reports* option from the environment main menu. These reports, however, will display/print only the first page of the ticket.

To obtain all pages of the ticket, the user will need to use the *Issue/Un-issue* button. If the work order already has been issued, select the draft option.

Tickets can be issued one at a time, or multiple work orders can be selected and issued together.

Issuing Tickets

Work order tickets to be issued can be chosen from the records displayed in the Work Order worksheet. First, highlight one or more work orders to be issued, then click on the *Issue/Un-Issue* button  on the tool bar.

The issue ticket selection system will respond with the Work Order Ticket Issue Options window:

The issue options are:

- **Issue Only – Do Not print:**
Sets the issue date only
- **Issue and Print:** Send the tickets to the printer.
- **Print a Draft – Do not Issue:**
Issue tickets in draft format – the issue date on the work order will not be set and the word “<DRAFT>” will be printed at the top of the ticket and the instructions pages. If not a draft, the work order issue date will be set.

Work Order Issue Options

Issue Options

Print Options

Issue Only - Do Not Print

Issue and Print

Print a Draft - Do Not Issue

Print Attached Documents

Instructions

Material Listing

AutoCAD Drawing

Ticket Type Regular

OK Cancel Help

Tickets can be ordered with several attachments:

Instructions: Include the Work Order instructions (i.e., the work order description) page.

Material Listing: Include the Pallet Material List – a pallet must have been created that has the selected work order (complete with work center) associated with it. If this option is selected, and no associated pallet exists, the material list page will still print, but without data.

AutoCAD Drawing: Include the *AutoCAD* drawing image – the CAD file name and path to it must have been entered on the work order record in the field called “Drawing File Name.” If this option is selected, and no associated drawing exists, nothing will be visible on the drawing tab of the work order issue window.

The final option determines the type of ticket format:

- Regular Format
- Subcontractor Format

Time Charging Work Orders

PERCEPTION provides the means for entering time charges against work orders.


This enables the system to track actual labor hours and costs against budgets and to make measured assessments of cost performance, not only by projects, but also at any level of the project work breakdown structure.

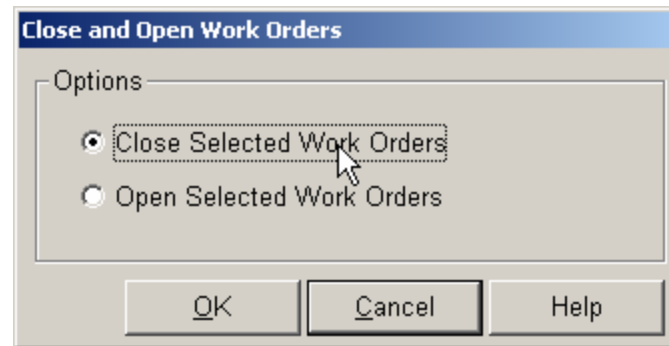
For details on entering time charges, please refer to the manual entitled “Accounting Functions & Interfaces.”

Closing Work Orders

When work orders are complete, they must be closed so that:

- 1. The system can recognize 100% progress**
- 2. The system will prevent further time charging to the closed work order.**

To close a work order, highlight one or more work orders in the Work Order worksheet and click on the *Close/Open* button  on the tool bar.



Select *Close Selected Work Orders* from the pop up window.

Closing A Distributed Work Order

Distributed work order subtasks cannot be closed individually; they can only be closed when all subtasks have been completed.

This means that only the distributed primary work order can be closed.

When the user closes a distributed primary work order, this process automatically closes all of the subtasks.

Reopening a closed distributed work order automatically reopens all subtasks.

Closing A Time-phased Work Order

It is not necessary to close the individual subtasks on a time-phased work order. Time charges are applied only to the subtask that corresponds to the date of the charge.

When the user closes a time-phased primary work order, this process automatically closes all of the primary's subtasks.

Reopening a closed time phased work order automatically reopens only those subtasks whose planned finish dates are after the date that the primary work order is re-opened.

Re-Opening Work Orders

The user also can reopen a closed work order. This procedure reopens the actual finish date and nullifies any existing “hours after close.”

The manual progress also is reset to a default value of 80%.

Labor Cost Status Rollup

The labor rollup process is an important function for operating the system.

This process summarizes labor cost information from the work orders.

It also computes labor cost and schedule performance information throughout all defined levels of the project WBS.

The rollup process should be initiated when any of the following conditions have occurred:

- 1. Time charges have been entered against project work orders; the system needs to measure the impact upon budget performance and estimates to complete.**
- 2. Work orders have been completed and closed; the system needs to re-assess the impact on actual progress and cost and schedule performance.**
- 3. Budgets have changed; the system needs to re-assess the impact upon earned values, progress and projected final costs and estimates to complete.**
- 4. Work order planned schedules have changed; the system needs to re-assess the impact upon schedule performance.**

To initiate a rollup, click on the *Labor Rollup* button  on the toolbar.

This will open the rollup window, which offers a wide variety of options for rolling up the work order detail data up through the project WBS.

Contract ID	Project	Description
1 1999-01	DES-1	Sample Ship Repair Project
262-0101-01	101	Industrial Assembly
3A-DEMO	01	Sample Material Control

Roll Up From Work Orders

- Sum labor hours of trades to work orders
- TC** Sum labor hours of work orders to the WBS
- TC** Sum labor cost of work orders to the WBS
- Sum material cost of work orders to the WBS
- TC** Set the WBS actual start and finish dates from work orders
- Set the WBS planned start and finish date from work orders
- TC** Calculate BCWS, Progress, and Estimate to Complete

Special Options

- Re-Roll Budgets and Planned Dates through SWBS/PWBS/COA levels
- Re-Roll Timecards to Work Orders
- Re-Calculate the Trend EAC and Trend Weeks Ahead/Behind
- Set History Data To Current Data
- Do Material Cost Rollup

Budgets	Actuals	SWBS	PWBS	COA
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Options

Select All
Select Budgets
Select Actuals
Process Cancel Help

Note: Options with TC should be selected after processing Time

The labor roll up requires the user to first identify what project(s) are to be rolled up.

Multiple projects can have rollups performed in a single process by clicking on the desired projects in the project list sub-window (selected projects will be highlighted).

To select all projects click the top left heading button (all projects will be highlighted).

The roll-up has two separate sections for processing:

- 1. Roll Up From Work Orders (to WBS levels)**
- 2. Special Options**

Roll Up From Work Orders to WBS Levels

The **first roll-up section** provides for the following processes:

- 1. Sum labor hours of trades to work orders**
- 2. Sum labor hours of work orders to the WBS (recommended after time charges)**
- 3. Sum labor cost of work orders to the WBS (recommended after time charges)**
- 4. Sum material cost of work orders to the WBS**
- 5. Set the WBS actual start and finish dates from work orders (recommended after time charges)**
- 6. Set the WBS planned start and finish dates from the work orders**
- 7. Calculate BCWS, Progress, and Estimated to Complete (recommended after time charges)**

The first process will replace the work order labor budgets and actuals (hours and labor cost) by summing this information from the trade allocation records.

This is not a preferred option unless all planning is done at the trade allocation level of the work order.

Those processes identified by “TC” are normally required after new time charges have been entered and posted against work orders:

- 1. Rolling up time charge hours and labor costs**
- 2. Setting actual start and finish dates, including new finish dates established for new work order closings**
- 3. Re-calculations of progress, BCWS, and estimates at completion**

To the right of the above process selections, the user may limit the roll-up to use either budget information or actual, or both.

Then, the user must specify which WBS, or all of them, for the roll-up to be performed.

A short cut for the user is to just click on either the *Select Budgets* or the *Select Actuals* button, which will turn on all appropriate processes and all WBS.

The *Select All* button turns on all of these process (except for the first to roll-up from trade allocations). For special purposes, the user can modify these selections.

Special Options

The **second rollup processing section** has the following options:

- 1. Re-Roll Budgets and Planned Dates through SWBS/PWBS/COA levels**
- 2. Re-Roll Timecards to Work Orders**
- 3. Re-Calculate the Trend EAC and Trend Weeks Ahead/Behind**
- 4. Set History Data to Current Data**
- 5. Do Material Cost Rollup**

The first option rolls up lower level WBS budgets and planned start and finish dates up through the high levels of the WBS. The project and contract levels are rolled up from the WBS that the user has identified as being the *default WBS* (see the project DETAILS, *Options* tab).

The second option will re-summarize labor hours and costs from time charge records to the work orders. This process should not be required unless there has been a problem with the system database. Normally, the time charge posting process performs this function automatically.

The third option re-calculates the trend EAC and the Trend Week for the selected projects and their WBS levels. This process may be required only if the history file for the project(s) has erroneous information that produces incorrect trends.

The fourth option will stamp records of all current WBS status information into the project(s) history table (*Library/WBS History*). The time stamp for these history records are the date of the roll-up.

The fifth option will perform a similar rollup of all material costs to the selected project.

When all the options and project selections have been made, click on the *OK* button, and the system will proceed with the rollup process.

Exception Reporting Prior To Project Rollups

It is best to use the Exception Report Tool before a rollup, because if there is bad data, the rollup will have to be re-done.

Otherwise, the forecast will not take into account the various work orders that have had data entry problems.

Miscellaneous Work Order Functions


PERCEPTION provides a wide array of specialized functions to help the user develop and manage work orders.

Global Work Order Copies

Selections of contracts and/or projects can be copied to other contracts and/or projects. This feature saves considerable time and effort when similar contracts and/or projects need to be set up by the user.

This feature also can be used to copy standard sets of project WBS descriptions and to copy standard sets of work orders already defined on the system database.

Both the target Contract and the target Project must exist before a copy can be performed.

**Open the Work Order worksheet
(Environment/Production Engineering/Work Orders)
and click on the *Copy Work Orders* button  on the
toolbar.**

This will open the *Copy Range* window. Indicate the source and the destination contract and project.

Copy Ranges

Contract and Project Source and Destination must exist before details can be copied.

Source: Contract 1999-01, Project 0

Destination: Contract TSHIP CONTRACT, Project //////////

Check to Copy

CLINs 0 //////////

Work Orders 0 //////////

Center Range for WOs 0 //////////

PWBS

Zones 0 //////////

Outfit Zones 0 //////////

Units\Blocks 0 //////////

Assembly 0 //////////

Sub Assembly 0 //////////

Parts 0 //////////

SWBS

Groups 0 //////////

Accounts 0 //////////

COA

Division 0 //////////

Department 0 //////////

Process 0 //////////

Copy Options: Copy Actuals Into Budgets

OK Cancel

Identify the contract and project from which work orders are to be copied (*Source*), and then the contract and project to which the work orders are to be created (*Destination*).

Click on the *Work Orders* check box.

A range of work order numbers and/or work centers may be specified for the copy.

Ranges also may be specified by entries in ranges of CLINs, SWBS, PWBS and/or COAs.

If you click on the check box for CLINs, SWBS, PWBS and/or COAs, these WBS levels also will be copied to the destination project.

If an error is encountered in the copy process, the system aborts the entire copy process.

The copy options provided are:


- 1. Copy only budget dollars and hours, and planned dates**
- 2. Copy budget and actual dollars, hours, and dates**
- 3. Copy actual dollars and hours into budgets**

Developing Work Orders From A Cost Estimate

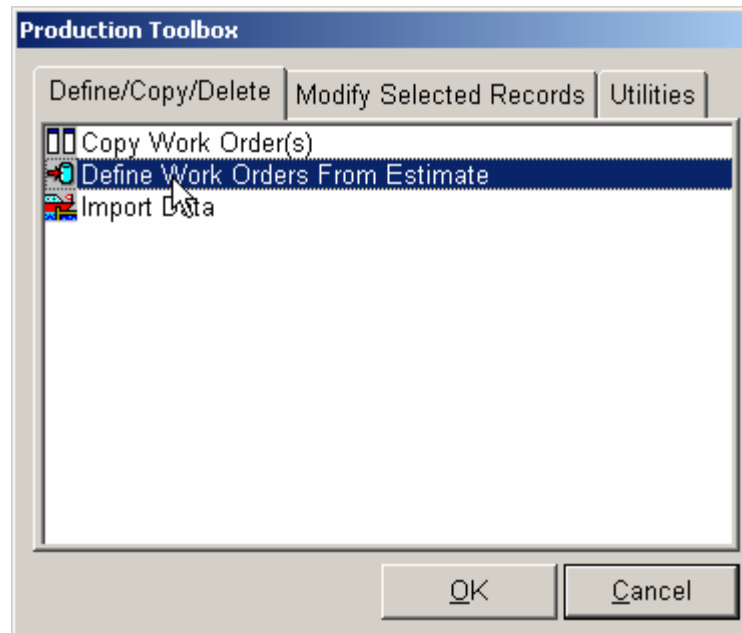
Work orders can be developed from a cost estimate set of cost items.

These may be only “planning” work orders, but actual production work orders may also be created depending on the level of details available from the cost estimate.

Oftentimes, a cost estimate that is generated from standard product and process packages can produce detailed production information.

Open the Work Order worksheet (*Environment/Production Engineering/Work Orders*) and click on the *Production Toolbox* button  on the toolbar.

This will open the toolbox tab window:



Select *Define Work Orders From Estimate*

The system will open the transfer specifications window:

Transfer Estimate To Production

Contract and Project Retrieval Options

List Only Open Contracts
 List Both Open & Closed Contracts

Contract 023

Project 023

Management Reserves

Labor Hours 0.00%

Material Dollars 0.00%

Set Budgets On WBS

SWBS
 PWBS
 COA

Create Planning Details

Requisitions
 Work Orders

Transfer Cancel Help

The options here enable the user to set production budgets from the estimate directly.

The user can identify the desired WBS by clicking on the appropriate check boxes (SWBS, PWBS and/or COA).

This requires that the same WBS will be used for production as was used to generate the estimate.

If the WBS production budgets are to be set up with this function, the user can identify a specific percentage of the estimate to be set-aside as management reserves.

To generate the work orders from the estimate:

- 1. Click on the *Work Orders* check box**
- 2. Click the *Transfer* button**

For generating work orders (click on the *Work Orders* check box), the system will transform the estimate cost items into work orders, using the same work centers and WBS labels as on the cost items.

If percentages are specified for management reserves, work order budget hours also are reduced by the same percentage.

Importing Work Orders

Work orders may be developed in another system, and they can be imported into *PERCEPTION* electronically in a number of different ways.

This process assumes that the data to be imported is structured in ways that can be used in *PERCEPTION*.

Open the Work Order worksheet (*Environment/Production Engineering/Work Orders*) and click on *Data/Get External Data* on the main menu.

The chapter “Importing & Exporting Data” of the “Getting Started With *PERCEPTION*” manual describes this process in detail.

Cut, Copy & Paste

Work order data also can be developed with copy and paste from other Windows-based software, including from other areas of *PERCEPTION*.

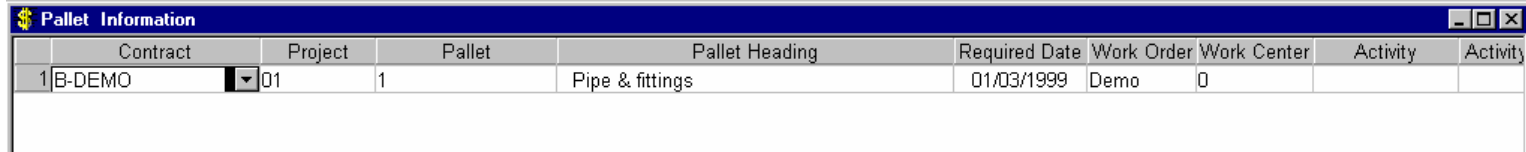
The chapter “Importing & Exporting Data” of the “Getting Started With *PERCEPTION*” manual describes this process in detail.

Work Order Pallet Requirements

To view or create pallets for a given work order, highlight the desired work order in the Work Order worksheet.

Then, click on the *Drill Down* button  on the toolbar and select *Pallets*.

The system will display the Pallet worksheet. This is a worksheet that allows multiple material pallets to be developed for any given work order.



Contract	Project	Pallet	Pallet Heading	Required Date	Work Order	Work Center	Activity	Activity
1 B-DEMO	01	1	Pipe & fittings	01/03/1999	Demo	0		

Double click on any pallet header row to open the pallet tab window. The first, opening tab window displays the header information in a forms format.

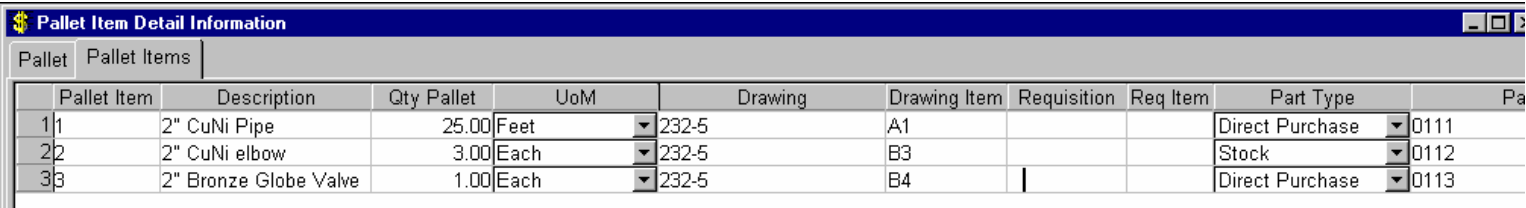
The screenshot shows a software window titled "Pallet Item Detail Information" with a "Pallet" tab selected. The window contains the following fields and values:

- Contract: B-DEMO (dropdown), Project: 01
- Pallet: 1, Pallet Heading: Pipe & fittings, Activity: (empty)
- Drawing: (empty), Center: 0, Work Order: Demo, Activity Center: (empty)
- SWBS: Group: 2, Account: 262
- PWBS: Zone: 20, Outfit Zone: (empty)
- COAs: Coa Grp: (empty), Coa Sgrp: (empty), Unit: 709P, Assembly: (empty)
- Coa Item: (empty), Supervisor: (empty), Sub Assy: (empty), Part: (empty)
- Revision: (empty), Status: Not Complete
- Date Required: 01/03/1999, Revision Date: 00/00/0000, Budget Hours: 0.00
- Pick to Location: (empty), Approved: Yes (dropdown), Complete: No (dropdown)
- Responsible Person: (empty), Planner: spar

The information in this window can be modified and saved as required.

The second tab opens the Pallet Item worksheet.

The procedures for adding, changing and deleting pallet items are the same as those outlined in the manual “Getting Started with *PERCEPTION*.”



Pallet Item	Description	Qty Pallet	UoM	Drawing	Drawing Item	Requisition	Req Item	Part Type	Pa
11	2" CuNi Pipe	25.00	Feet	232-5	A1			Direct Purchase	0111
22	2" CuNi elbow	3.00	Each	232-5	B3			Stock	0112
33	2" Bronze Globe Valve	1.00	Each	232-5	B4			Direct Purchase	0113

Double click on any of the pallet items to view the full details of the item.

The information in this window can be modified and saved as required.

The screenshot shows a software window titled "Pallet Item Detail Information". The fields are organized as follows:

- Contract: B-DEMO, Project: 01, Pallet: 1, Item: 2
- Requisition: [blank], Reqn Item: [blank], Drawing: 232-5, Drawing Item: B3
- Description: 2" CuNi elbow, Part Type: Stock, Part ID: 0112, UoM: Each, Qty: 3.00
- SWBS: Group, Account, COAs: Coa Grp, Coa Sgrp, Coa Item, Supervisor
- PWBS: Zone, Outfit Zone, Labor Rate 1: 0.0000, Labor Rate 2: 0.0000, Unit, Assembly, Sub Assy, Part, Factor: 1.00, Complete: No, Budget Hours: 0.00
- Pick Location, Status: Not Picked, MFG Part Number, Qty Picked: 0.00, Qty Used: 0.00, Revision, Responsible Person, Withdraw Date

If the pallet item has been identified with a Part ID, the *Labor Rate 1* and *Labor Rate 2* are labor CERs (labor hours per unit of measure) on the Parts Catalog.

The *Factor* is a manual entry (default of 1.00) to adjust the standard labor hours of the CERs for differences in complexity, quality assurance, work access, etc.

The *Budget Hours* for the pallet item is computed by the system as follows:

$$\text{Budget Hours} = (\text{Labor Rate 1} + \text{Labor Rate 2}) \times \text{Factor} \times \text{Qty}$$

The system computes the total budget hours for the pallet as the sum of budget hours for the items in the pallet.

For ship repair, the pallet may be used to identify all of the necessary material items needed to execute a specific work order.

For new construction, work order pallets can developed from engineering drawings bills of materials.

Pallets also can be developed from material requisitions.

The following tutorial describes in detail the planning and management of work order pallets:

PERCEPTION MAT-PAC: Work Order Pallets

Attach/Detach Planning Activities

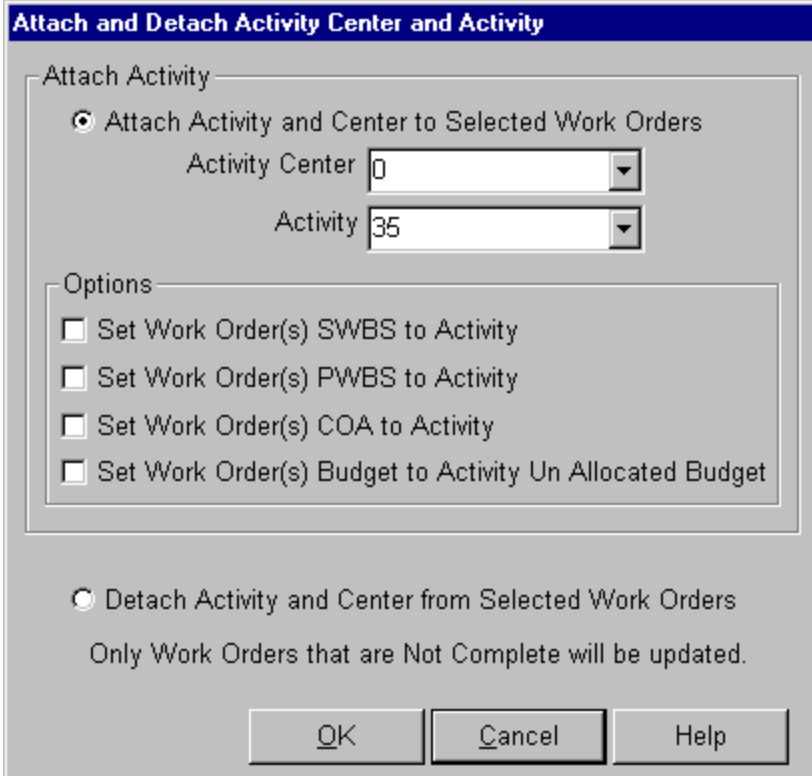
This process either attaches planning activities to the selected work orders or detaches the work orders from them.

A planning activity is identified by its activity number and its activity center.

Select the work order(s) in the **Work Order worksheet**, and click on the *Attach/Detach Planning Activity* button  on the toolbar.

If the **SWBS, PWBS or COA** options are turned on, the work orders will be assigned to the same WBS as already defined for the planning activity.

If the “**Un Allocated Budget**” option is set, the first work order identified for global changes in the work order worksheet will have its labor hour budget set to be equal to any labor hour budget not already allocated to other work orders.



Attach and Detach Activity Center and Activity

Attach Activity

Attach Activity and Center to Selected Work Orders

Activity Center 0

Activity 35

Options

Set Work Order(s) SWBS to Activity

Set Work Order(s) PWBS to Activity

Set Work Order(s) COA to Activity

Set Work Order(s) Budget to Activity Un Allocated Budget

Detach Activity and Center from Selected Work Orders

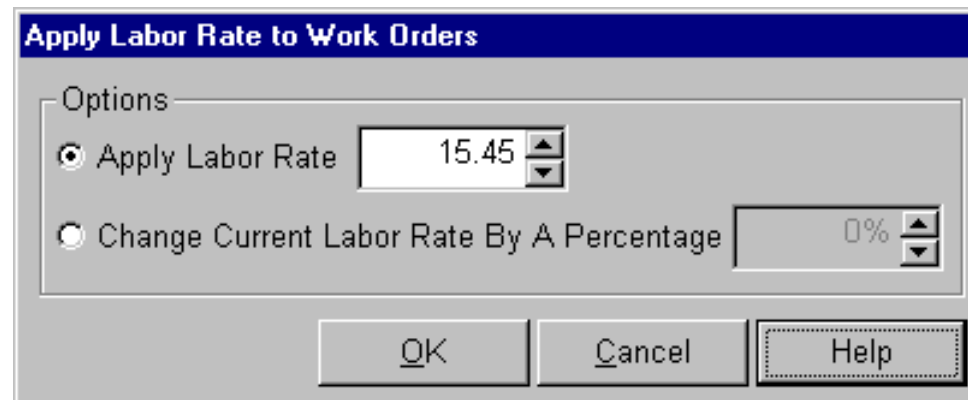
Only Work Orders that are Not Complete will be updated.

OK Cancel Help

Apply Labor Rate

This process either applies a fixed labor rate to the selected work orders, or will increase/decrease existing labor rates by a fixed percentage.

Select the work order(s) in the Work Order worksheet, and click on the *Apply Labor Rates* button  on the toolbar.



Apply Labor Rate to Work Orders

Options

Apply Labor Rate

Change Current Labor Rate By A Percentage

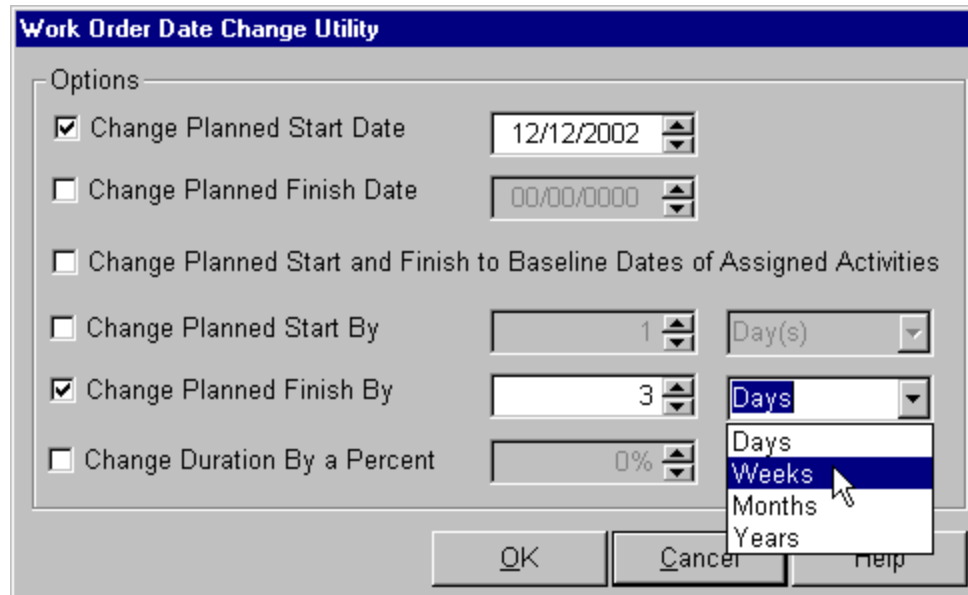
OK Cancel Help

Re-Schedule Work Orders

This process either applies a new start and/or finish date to the selected work orders, or will increase/decrease existing schedules by a specified number of days, weeks, or months.

Select the work order(s) in the Work Order worksheet, and click on the *Reschedule Work Orders* button  on the toolbar.

Note: This utility does not function on time-phased or incremental work orders.



Work Order Date Change Utility

Options

- Change Planned Start Date 12/12/2002
- Change Planned Finish Date 00/00/0000
- Change Planned Start and Finish to Baseline Dates of Assigned Activities
- Change Planned Start By 1 Day(s)
- Change Planned Finish By 3 Days
- Change Duration By a Percent 0%

OK Cancel Help

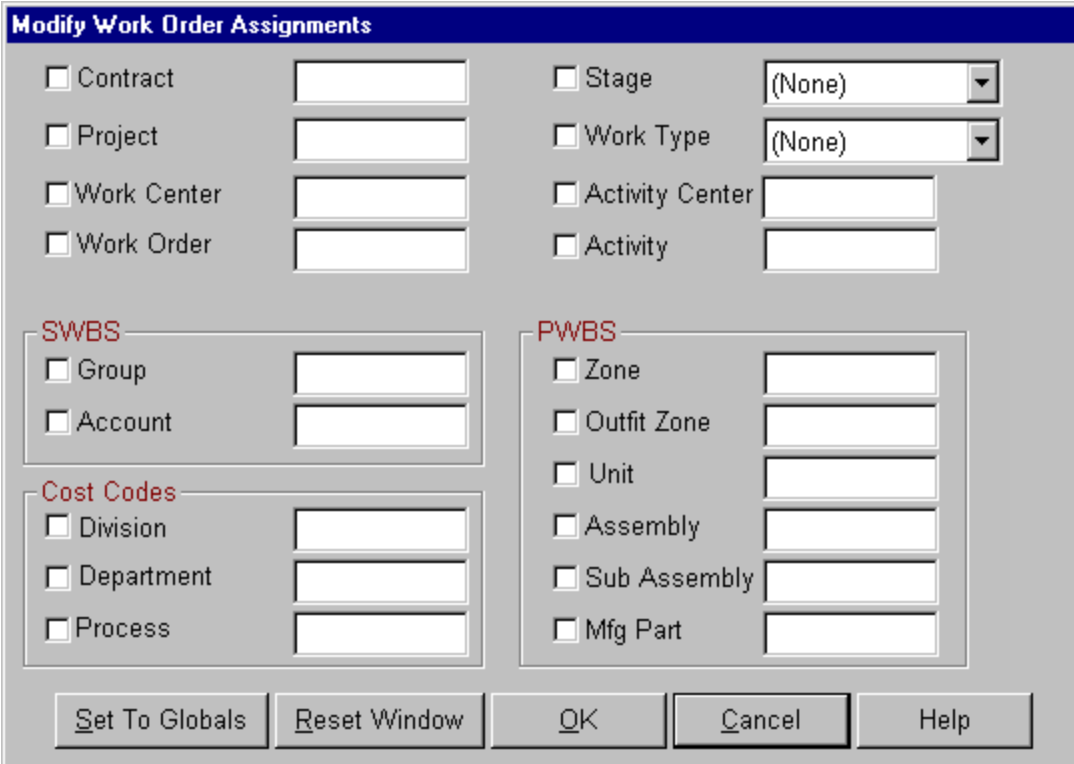
Modify Work Order Assignments

This process enables the user to define/redefine information for selected work orders in the work order worksheet.

Select the work order(s) in the Work Order worksheet, and click on the *Modify Work Order Assignments* button  on the toolbar.

The system displays the information that can be modified.

Each data field is activated only when its check box is selected and the data value has been entered.



Modify Work Order Assignments

Contract
 Project
 Work Center
 Work Order

Stage (None)
 Work Type (None)
 Activity Center
 Activity

SWBS

Group
 Account

Cost Codes

Division
 Department
 Process

PWBS

Zone
 Outfit Zone
 Unit
 Assembly
 Sub Assembly
 Mfg Part

Work Order Tool Box Functions

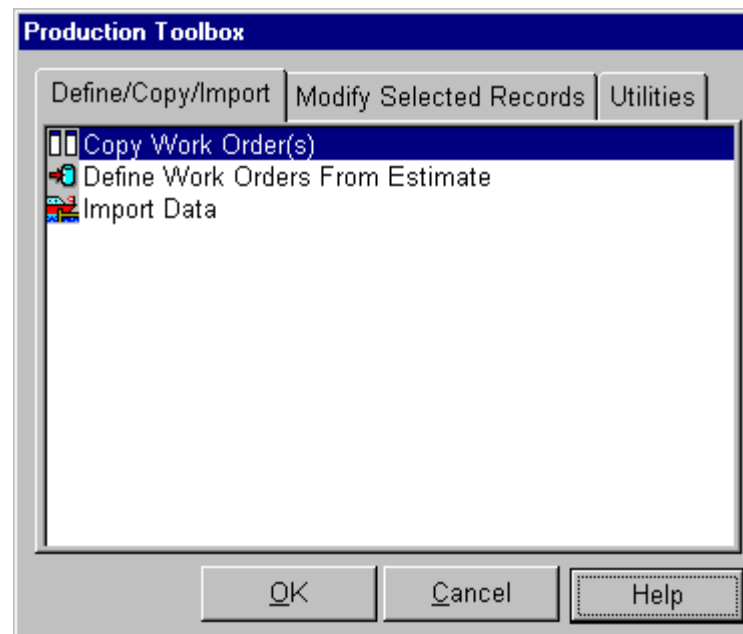
Selections of work orders can be modified also via the toolbox.

Click on the *Production Toolbox* button  on the toolbar.

The system will open the toolbox selections that are available.

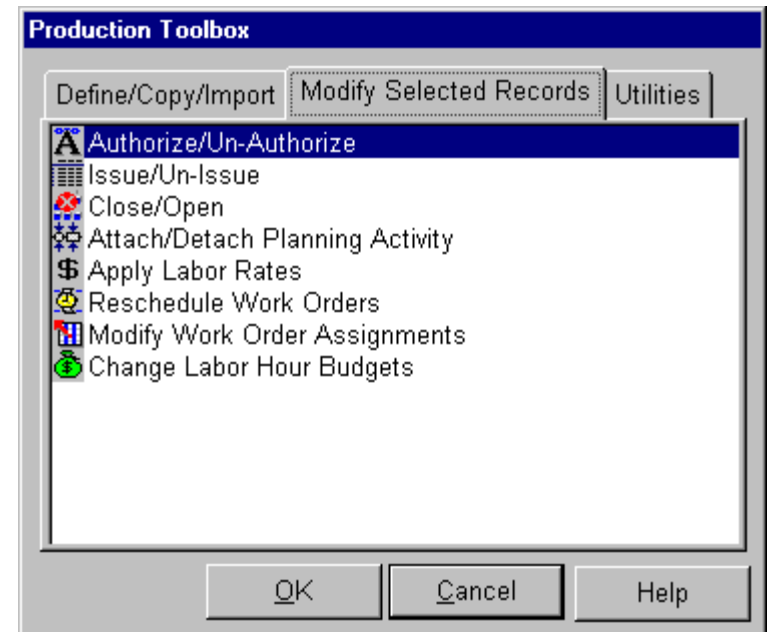
The first tab on the toolbox window provides the following options:

- 1. Copying of work orders from other projects**
- 2. Developing work orders from estimate cost items**
- 3. Import Data**



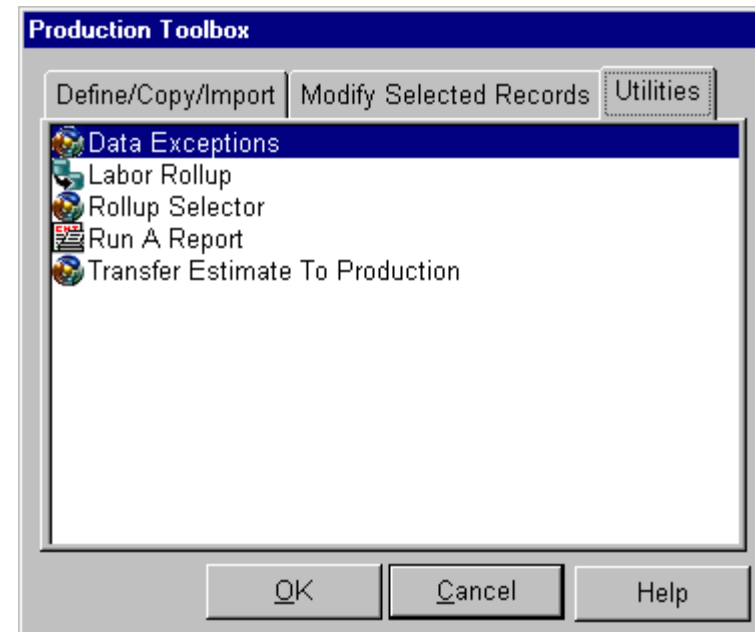
The second tab on the toolbox window provides the following options:

1. Authorize/Un-Authorize Work Orders
2. Issue/Un-Issue Work Orders
3. Close/Open Work Orders
4. Attach/Detach Planning Activities
5. Apply Labor Rates (to work order budget hours to compute labor cost budgets)
6. Re-schedule selected work orders
7. Modify Work Order Assignments
8. Modify work order labor hour budgets



The third tab on the toolbox window provides the following options:

1. Report data exceptions
2. Perform labor rollup
3. Select type of rollup (labor, material, estimate & baseline)
4. Run a report
5. Transfer estimate to production



Project Status, Progress & Forecast Reporting

The system provides a wide selection of reports, report options, and report formats. Status information can be viewed on-line (displayed), printed, and emailed.

In addition, since the database conforms to ODBC standards, ad hoc reports also can be developed to suit any specific requirement.

Data from worksheets can be exported or copied and pasted to other desktop products (Microsoft *Access*, *Excel*, etc.) for customized formatting needs. Refer to the manual “*Getting Started With PERCEPTION*” for details on copying and exporting features.

On-Line Review Of Project WBS

The system provides a graphical means to drill down and review the entire contract work breakdown structure, including SWBS, PWBS and COA.

WBS Drill Down Review: The entire contract WBS can be viewed, from overall contract down through to the project work packages.

Click on the *Project Navigator* button  on the main toolbar.

**The Project Navigator operates in the following manner:
The selected contract, project and WBS (SWBS, PWBS,
and COA) level will be displayed on the Drill Down
review window.**

**Each level that has information below it is annotated with
a plus sign [+] to the left of its description line.**

**Click on this [+] beside a specific contract to display the
projects defined on the database under the contract and
so on down through all the levels of the contract.**

Project Navigator Display

The screenshot displays the 'Project Navigator' window with a hierarchical tree structure. The tree is organized as follows:

- WBS
 - Company Parameters
 - Perception Parts Catalog
 - Contract - 62-0101-01 - Sample Industrial Contract
 - Contract - A-DEMO - Demo Contract for MAT-PAC Tutorial
 - Contract - B-DEMO - Demo Contract for WORK-PAC Tutorial
 - Contract - C-DEMO - Demo Contract for Hull Block Const. Tutorial
 - Contract - PD-337 - Multiple Commercial Cargo Ship Program - Estimating Demo
 - Projects
 - Project - 337 - Ship #1 Sample Detail Cost Estimate
 - SWBS
 - SWBS Group - 1 - Hull Structure
 - SWBS Group - 2 - Propulsion Plant
 - SWBS Group - 3 - Electric Plant
 - SWBS Group - 4 - Command & Surveillance
 - SWBS Group - 5 - Auxiliary Systems
 - SWBS Group - 6 - Outfit & Furnishings
 - SWBS Group - 7 - Armament
 - SWBS Group - 8 - Integration & Engineering
 - SWBS Group - 9 - Shipyard Support Services
 - PWBS
 - COA
 - Characteristics
 - Design Packages
 - Project - 338 - Ship #2
 - Project - 339 - Ship #3
 - Contract - Pirate Ships, Inc. - High-Speed wooden sailing vessels - Estimating Demo
 - Contract - STOCK - STOCK MATERIAL CONTRACT
 - Contract - TSHIP CONTRACT - T-SHIP Series Contract - Production Demo
 - Projects
 - Project - 2002 - Severn
 - SWBS
 - PWBS
 - COA
 - Characteristics
 - Design Packages

A context menu is open over 'Project - 2002 - Severn', showing the following options:

- Details
- Composite Cost Summary
- Properties
- Go To
- Management Graphs

Highlight any level of the drill down review and right click to open a pop up menu:

These selections are the following:

1. **Details** opens the summary information tab window.
2. **Composite Cost Summary** opens the summary information that compares status information of the cost estimate, baseline planning, material costs, production labor.
3. **Properties** displays database status of the WBS record.
4. **Go To** allows the user to proceed directly to the WBS level worksheet.
5. **Management Graphics** opens a window of report graphics selections.

Project Level Details Summary Display Window

Project Details Information									
Details	Material Status	Totals	Indexes	Variances	Notes	Baseline	Options	Milestones	Characteristics
Contract	TSHIP CONTRACT		Description				Severn Bulk Carriers (Detail Work Orders)		
Project	2002						Effective Date: 01/14/1993		
	Budgeted Cost of Work Scheduled	Budgeted Cost of Work Performed	Actual Cost of Work Performed	Budgeted Cost	Estimated at Completion	Reserves			
Man-Hours:	693,209	689,077	660,525	1,014,393	984,555	1,000,000.00			
Rate/Hour:	17.30		16.27		16.16				
Labor Cost:	11,989,786	11,918,328	10,748,477	17,545,014	15,907,329	1,730,000			
	Budget + Reserves	Less EAC	Less Rework	= Labor Margin	Estimated Remaining Labor	<i>NOTE: Rework included in ACWP or EAC</i>			
Man-Hours:	1,114,393	984,555	8,503	121,335	324,030				
Labor Cost:	19,275,014	15,907,329	147,150	3,220,535	5,158,852				
	Start	Finish	Total Progress	67.93 %	(Closed	58.26 %	In-Process	9.67 %	
Planned	09/12/1991	09/17/1993	Total Planned	68.34 %	(Behind	-0.41 %		-0.21 weeks)	
Actual	05/13/1991	00/00/0000	Total Manual	58.20 %	Number of Work Packages:		2529		
					Budgeted Hours:		1,014,393.00		