

Ship Repair, Maintenance & Modernization Cost Model

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The Cost Model is a Microsoft EXCEL workbook that contains various tabbed worksheets. There are worksheets to enter basic project information such as ship characteristics , rates and factors to use and the detailed cost items required for the estimate. The following illustrates the various worksheets in the Cost Model workbook.

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Tab Color				
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	INSTRUCTIONS			
1-0	Defining The Ship & Its Characteristics			
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3-0	Cost Estimate Details	No. Cost Items Available	Used For Labor	Used For Material
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3-2	Docking & Services	132	-	-
3-3	Structural Repairs	115	-	-
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3-5	Piping Repairs	132	-	-
3-6	HVAC Repairs	19	-	-
3-7	Hull Outfit Repairs	172	-	-
3-8	Clean & Paint Repairs	143	-	-
3-9	Accommodations Repairs	429	-	-
3-10	Electrical Repairs	360	-	-
3-11	Electronics Repairs	7	-	-
3-12	Armament Repairs	7	-	-
3-13	Technical Support	8	-	-
3-14	Miscellaneous Support	20	-	-
3-15	Fees, Contingency, Bonds & Insurance	25	-	-
		1,657	-	-

NOTE: Cost Items in use in various detail worksheets are indicated as green cells, and green characters in the "Labor Baseline Hrs" and/or "PYR Baseline \$Mat'l" columns

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2 Versions:

- Metric
- U.S.

The “Ship Repair, Maintenance & Modernization” Cost Model provides a wide range of typical ship repair and maintenance activities (over 1,400 ship yard services and production processes across 15 different work categories) from which the user may choose to generate a cost estimate.

The Cost Model generates detail estimates for labor hours and material costs and summarizes them according to the cost model’s repair work breakdown structure (“RWBS”) as shown below:

<u>Surveys & Inspections</u>	100
<u>Docking & Services</u>	200
<u>Structural Repairs</u>	300
<u>Machinery Repairs</u>	400
<u>Piping Repairs</u>	500
<u>HVAC Repairs</u>	600
<u>Hull Outfit Repairs</u>	700
<u>Clean & Paint Repairs</u>	800
<u>Accommodations Repairs</u>	900
<u>Electrical Repairs</u>	1000
<u>Electronics Repairs</u>	1100
<u>Armament Repairs</u>	1200
<u>Technical Support (10.0%)</u>	1300
<u>Miscellaneous Support</u>	1400
<u>Contingency, Bonds & Insurance</u>	1500

Limited Sample of Available Electrical Services Detail Cost Items

WC	RSWBS	Cable	Cable Diam (mm)	QTY	UoM	2012			2012	
						Labor	PYR \$Mat	Use	Labor	PYR
						CER	CER	Factor	Baseline Hrs	Baseline \$Mat'l
SY	1000	Cable Cutting Setup per Shift			EA	0.9400	\$ -	1.00	-	\$ -
SY	1000	Cable Cutting Labor			FT	0.0070	\$ -	1.00	-	\$ -
SY	1000	Cable Pulling Setup per Shift			EA	0.9400	\$ -	1.00	-	\$ -
SY	1000	Cable Pulling Labor: Install cables in wireways, tie wrap down in neat, orderly fashion to simplify banding & eliminate rework	50.00	75.00	M	0.0900	\$ -	1.00	7	\$ -
SY	1000	HV Cable Pulling High Voltage - Single & Multi-Core (including Tie-Wraps, excluding installing HV Cleats)	50.00	45.00	M	0.6847	\$ -	1.00	31	\$ -
SY	1000	LV Cable Pulling Low Voltage - Single & Multi-Core (including Tie-Wraps)	50.00	50.00	M	0.4174	\$ -	1.00	21	\$ -
SY	1000	Earthing Cable Pulling (including Tie-Wraps)	50.00	50.00	M	0.4174	\$ -	1.00	21	\$ -
SY	1000	Pulling Data & Transmission Cable RG-11/U-Type Quad Shield Coaxial Cable - Belden 3094a		45.00	M	0.1109	\$ -	1.00	5	\$ -
SY	1000	Pulling Data & Transmission Cable Low Capacitance Dual Shield 3 Pair Cable - Belden 9843			M	0.1780	\$ -	1.00	-	\$ -
SY	1000	Pulling Data & Transmission Cable Fiber Optic 62.5/125 4C M			M	0.2194	\$ -	1.00	-	\$ -
SY	1000	Pulling Data & Transmission Cable Individually Shielded And Braided 2 Pair Cable - Belden 3084a			M	0.1371	\$ -	1.00	-	\$ -
SY	1000	Pulling Data & Transmission Cable Shielded And Flame Retardant 2 Pair Cable - Belden - 3079a			M	0.1371	\$ -	1.00	-	\$ -
SY	1000	Pulling Data & Transmission Cable CAT 5E ES 2 Pair Cable - Leoni - L45467-J16-B26			M	0.1109	\$ -	1.00	-	\$ -
SY	1000	Pulling Data & Transmission Cable CAT 5E ES 4 Pair Cable			M	0.1218	\$ -	1.00	-	\$ -
SY	1000	Pulling Data & Transmission Cable 75 Ohm Coaxial Screened Cable			M	0.1109	\$ -	1.00	-	\$ -

More Detail Cost Items are Available Under Sub-Categories within Each Detail Estimate Worksheet

Docking Services

Pilots
Tugs
Warfage
Dry Docking (LOA/DAY)
Blocking/Unblocking
Haul Days (Select One)
Dry Dock Lay Days
Warf Lay Days (Select One)
Mooring Fees (Select One)
Divers
Bilge Cleaning
Fuel Removal
Fuel Tank Cleaning - Safe Entry Only
Fuel Tank Cleaning - Safe Hot Work Condition
Tank Slops Disposal
Gas Free Certificates
Temporary Services - Electrical
Temporary Services - Telephone & Internet
Temporary Services - Water
Temporary Services - Steam Systems
Temporary Services - Sewage & Garbage Disposal
Temporary Services - Compressed Air Systems
Temporary Services - Fire Protection Systems
Temporary Services - Equipment
Misc Services
Labor Rate - All Crafts/Trades
Material Markup
Related Services

Structural Services

Steel Plate Fairing
Steel Plate Doubling
Steel Fabrication
Steel Plate Renewal
Steel Section Renewals
Steel Plate Cut & Fit
Steel Fab & Install On-Board
Hatch Cover Repairs
Tank Renewal & Tests
Miscellaneous
Steel General Repairs
Welding Repairs
Weld Grinding
Carbon Steel Welding (Manual)
Carbon Steel Welding (Robotic)
NDT Testing of Steel Welds
Aluminum Plate Fairing
Aluminum Doubling Plates
Fabricating Aluminum Sections
Aluminum Sections Renewal
Aluminum Plate Renewal
Aluminum Plate Cut & Fit
Aluminum Welding

Machinery Services

General Machining
Shafting Work
Propeller Work
Rudder Work
Sea Chest Work
Bow & Stern Thrusters Work
Engine Parts - Cylinder Heads
Engine Parts - Manifolds
Engine Parts - Crankshafts
Engine Parts - Turbochargers
LNG Fuel Diesel Conversions

Piping Systems Services

Labor Hours to Renew Pipe
Pipe Material Cost
Bondstrand FRP Pipe & Fittings
Renew Pipe Fittings
Remove Pipe Insulation
Install Pipe Insulation
Valve Inspection, Cleaning & Refurbishment
PUMPS - Overhaul
Pumps - Steering Gear

HVAC Services

HVAC Fab & Assembly
HVAC Install
Deck House & Accommodations Ventilation
Machinery Spaces Ventilation

Cleaning & Coating Services

Non-Blast Cleaning
Sandblast Grit
Sand Blasting
Blast & Sweep
Other Hull Cleaning Methods
Paint Preparations
Antifouling Coating - Material Cost Only
Primer/Base Coat - Material Cost Only
Alkyd Coating - Material Cost Only
Urethane Coating - Material Cost Only
Epoxy Coating - Material Cost Only
Other Ship Coating Products
Paint Applications
Painting by Ship Area
Coating Inspections
Tank Preservation

Hull Outfit Services

Anchor Chains
Anodes
Tank Tests & Refurbishments
Docking Plugs
Temporary Access
Ultra-Sonic Testing
Railings
Miscellaneous
Hull Insulation - Asbestos Removal
Remove Other Insulation
Install Insulation

Accommodations Outfit Services

Remove Deck Covering
Deck Covering Renewal
Remove Sheathing & Linings
Remove Bulkheads & Partitions
Remove Doors
Remove Lockers, Shelving & Racks
Remove Berthing Furnishings
Remove Office, Recreational & Other Furniture
Remove Galley & Mess Appliances & Furniture
Remove Laundry Appliances
Remove Lavatory Appliances
Remove Infirmary Furnishings
Remove Miscellaneous Equipment & Systems
Passenger Vessel Accessibility Guidelines Upgrades
Install Deck Covering
Install Sheathing & Linings
Install Bulkheads & Partitions
Install Doors, Hatches & Scuttles
Install Lockers, Shelving, Racks & Bins
Install Berthing Furnishings
Install Office, Recreational & Other Furniture
Install Galley & Mess Appliances & Furniture
Install Laundry Appliances
Install Lavatory Appliances
Install Infirmary Furnishings
Install Miscellaneous Equipment & Systems

Electrical Services

Refurbish Electric Motors
Install Electric Motors
Refurbish Motor Controllers
Refurbish Electric Generators
Cable
Cable Renewal
Cable
Multi-Cable Transit (MCT) Labor
Hawke Circular Cable Transit (HRT) Labor
Rectangular Cable Transit Frame
Install Cable Trays & Ladders
Cable Trays, Fittings, Covers & Wireways
Wireways
Shoot Cable Studs
Prep & Mount Electrical Equipment
Cable (General) - Install Labor & Material
Install Cable Glands
Terminating
Heat Tracing
Motor Control Centers (MCC)
Motor Controllers
Switchboards Power Distribution
Lighting System Fixtures
Hookup Cable - Small Enclosures
Hookup Cable - Medium Enclosures
Hookup Cable - Large Enclosures
Install Instrumentation
Install Electrical Panels
Fiber Optic Cable - See Note Below

Other

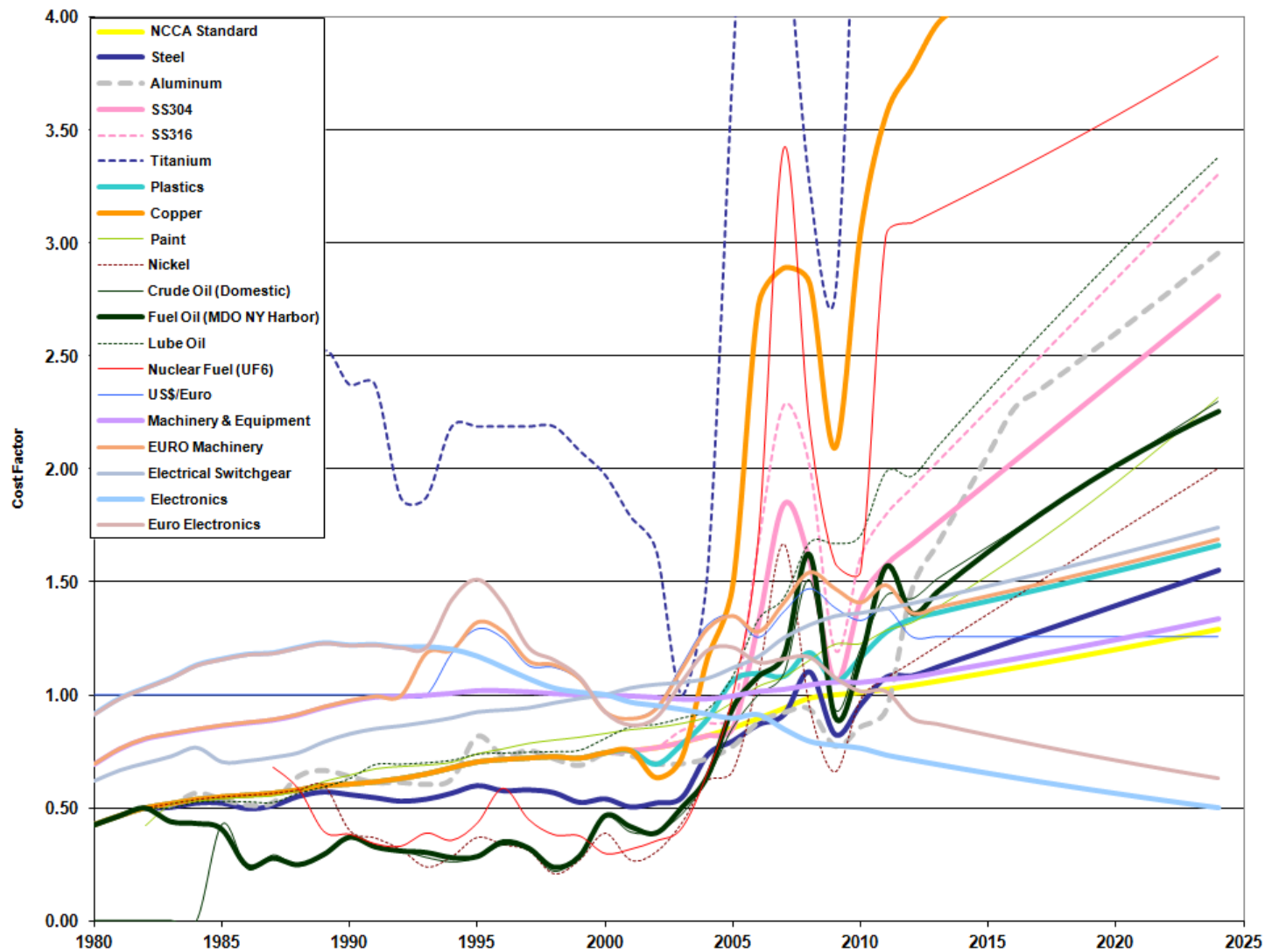
Surveys & Inspections
Electronics
Armament
Technical Support Services
Miscellaneous Support Services
Fees & Insurance

Escalating Material Cost CERs

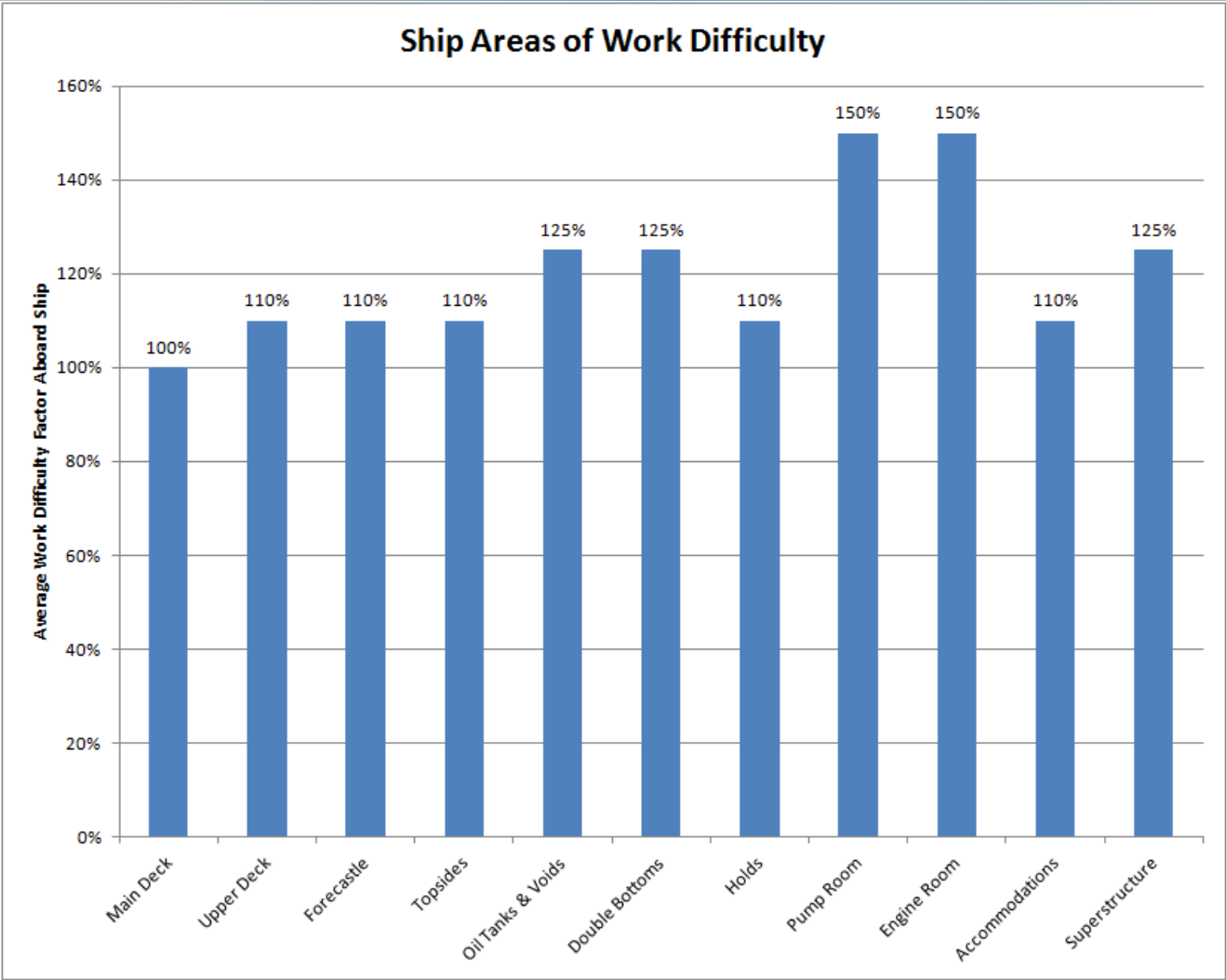
The user defines in the “Rates & Factors” worksheet the “present” year (“PYR”) for the cost estimate. The Cost Model automatically adjusts the original date material costs to suit that “present” year by applying appropriate escalation factors (illustrated on the next slide) based on the type commodity of the cost items.

				2012				Escalation	2012
				PYR \$Mat	Base Cost	Base Year	Type	Factor	Inflation
				CER	Date	Material \$	Escalation	Column No.	Factor
		QTY	UoM						
Fab bulkheads w/stiffeners (/MTON)		15.50	MT	\$ 2,160	2012	\$ 2,160	Steel	5	1.0000
Fab complex steel sections w/ rolling or bending (/MTON)			MT	\$ 2,160	2012	\$ 2,160	Steel	5	1.0000
Fab complex steel sections w/o rolling or bending (/MTON)			MT	\$ 2,160	2012	\$ 2,160	Steel	5	1.0000
Fab decks w/stiffeners (/MTON)		28.30	MT	\$ 2,160	2012	\$ 2,160	Steel	5	1.0000
Fab simple steel sections w/o rolling or bending (/MTON)			MT	\$ 2,160	2012	\$ 2,160	Steel	5	1.0000
	Plate Thickness mm								
Steel Plate Renewal									
Plate Renewal - Mild Steel Plate w/Welding Supports	50.00	100.00	M2	\$ 546.80	2012	\$ 546.80	Steel	5	1.0000
Plate Renewal - HY-80 Plate w/Welding Supports 1/4"		-	M2	\$ 212.16	2012	\$ 212.16	Steel	5	1.0000
Plate Renewal - Stainless Steel Plate w/Welding Supports	50.00	100.00	M2	\$ 241.12	2010	\$ 202.85	SS316	11	1.1887

Material Commodity Cost Escalation Factors



The “Use Factor” can be modified to adjust costs be Areas of Difficulty on board the ship. The “Use Factor” also may be increased in value if the work may involve more scope than normal.



Modifying & Adding Cost Items to the Cost Model

The user may easily modify the CERS to reflect his/her own cost experience. New cost items may also be added to the worksheets following very simple guidelines as described in the [User Manual](#).

Other Cost Model Adjustment Features

The Cost Model provides a user-defined entry for a general labor productivity factor that can be applied to the estimated labor hours to what may be more relevant to a shipyard's own experience (higher or lower levels of productivity).

There also is an entry for defining a currency exchange rate to convert from US\$ to another currency. The Cost Model will apply this rate to all material cost generated by the model.

Still another factor can be defined that reflects a general increase or decrease in local material costs relative to average purchases of materials in the US.

**The Cost Model Generates a
Summary Cost Estimate Report from
all the Detailed Cost Items**

Ship Repair, Maintenance & Modernization Cost Model

(Model Version June 2012)



% Mark-Up	-	%
% Change Orders	10.00	%
% Program Costs	-	%
% Contingencies	15.00	%

Ship Type:

Sample Ship Repair - M/V Houston

Version:

06-Dec-12

Pricing:

Technical Wage \$/Mhr:	\$ 29.00	\$ 72.50	w/ overhead
Production Wage \$/Mhr:	\$ 24.00	\$ 60.00	w/ overhead
% Overhead:	150.00	%	
% G&A Labor:	4.00	%	
% G&A Material:	6.00	%	
% Profit:	15.00	%	
Taxes:	6.00	%	

Estimated Schedules

Est. Detail Engineering Time:	-	Months
Est. Production Time:	4.00	Months
Overlap:	-	Months
Overlap:	0.0%	Production
	0.27	Months
RMS Men/Month:	762	

Current Year: **2012**

Shipyard Productivity

Additional Material Escalation:	1.00	1,000 = none	Shipyard Tech Support Labor Factor:	1.1000
Shipyard Material Cost Factor:	1.00	MILSPEC Prem.=1.21	Structural Work Productivity Factor:	1.2000
Combined Material Cost Factor:	1.00		Outfit Work Productivity Factor:	1.4000

	RSWBS	Production	\$	\$	\$ G&A	2012	\$ G&A	\$ Profit	\$	\$
	Group	M-Hrs	Labor	Overhead	Labor Only	\$ Material	Material Only	labor + Material	Total	Cum.Total
Surveys & Inspections	100	616	17,864	26,796	1,786	9,852	591	8,533	65,423	
Docking & Services	200	14,448	346,752	520,128	34,675	871,637	52,298	273,824	2,099,314	
Structural Repairs	300	64,114	1,538,735	2,308,103	153,874	307,426	18,446	648,987	4,975,570	
Machinery Repairs	400	198	4,741	7,112	474	214	13	1,883	14,437	
Piping Repairs	500	164,669	3,952,054	5,928,081	395,205	1,657,613	99,457	1,804,861	13,837,271	
HVAC Repairs	600	-	-	-	-	-	-	-	-	
Hull Outfit Repairs	700	793	19,023	28,534	1,902	9,770	586	8,972	68,788	
Clean & Paint Repairs	800	121,510	2,916,239	4,374,359	291,624	73,401	4,404	1,149,004	8,809,031	
Accommodations Repairs	900	-	-	-	-	-	-	-	-	
Electrical Repairs	1000	465	11,148	16,722	1,115	-	-	4,348	33,333	
Electronics Repairs	1100	-	-	-	-	-	-	-	-	
Armament Repairs	1200	-	-	-	-	-	-	-	-	
Technical Support (10.0%)	1300	40,349	1,170,129	1,755,193	117,013	25,000	1,500	460,325	3,529,160	
Miscellaneous Support	1400	71,968	1,727,242	2,590,863	172,724	702,169	42,130	785,269	6,020,398	
Fees, Contingency, Bonds & Insurance	1500	-	-	-	-	10,500,791	630,047	1,669,626	12,800,465	
Ship Totals:		479,129	\$ 11,703,927	\$ 17,555,891	\$ 1,170,393	\$ 14,157,873	\$ 849,472	6,815,634	\$ 52,253,190	\$ 52,253,190

6.0% Taxes: \$ 3,135,191

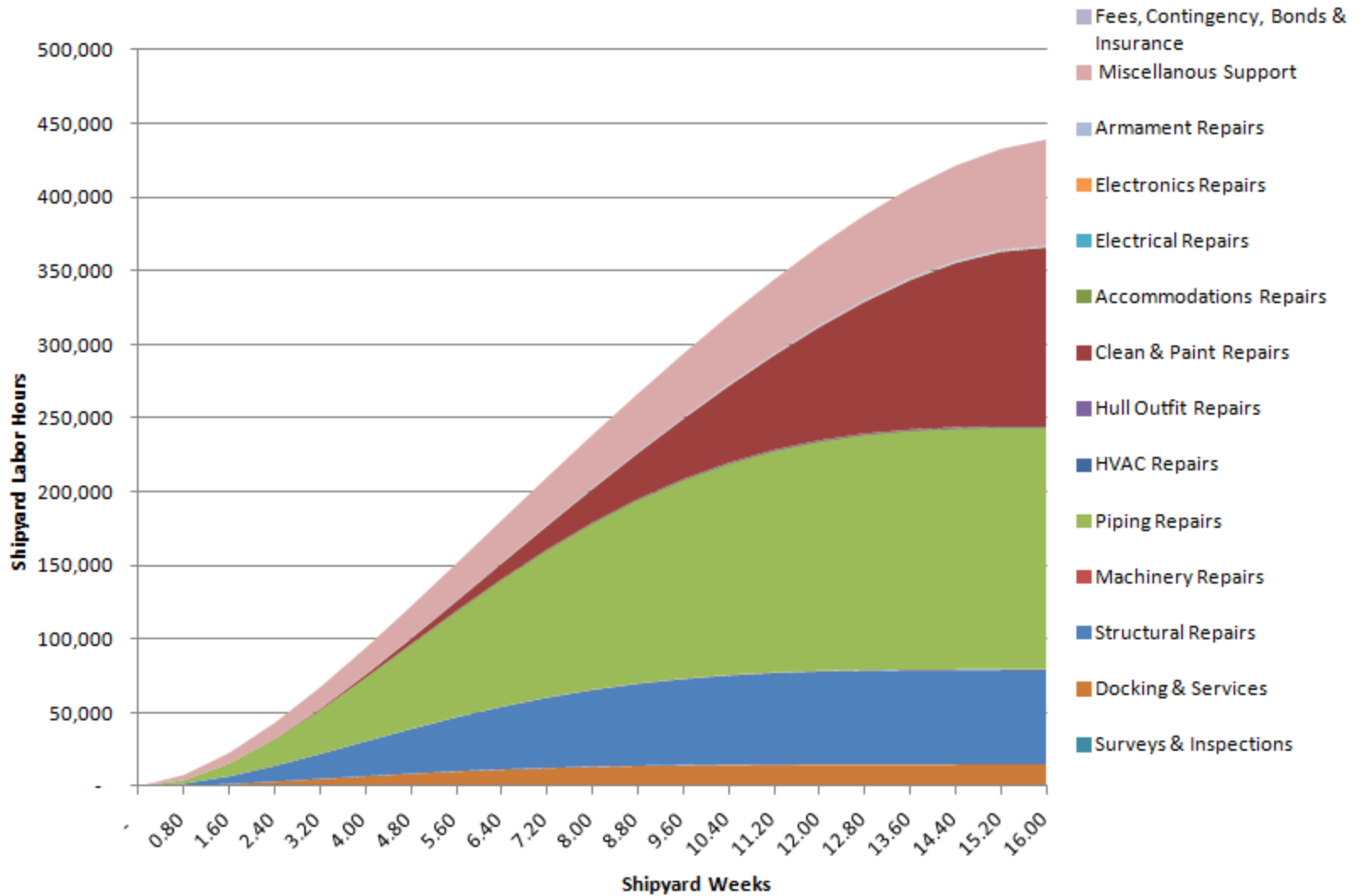
TOTAL: \$ 55,388,382

Cost Risk

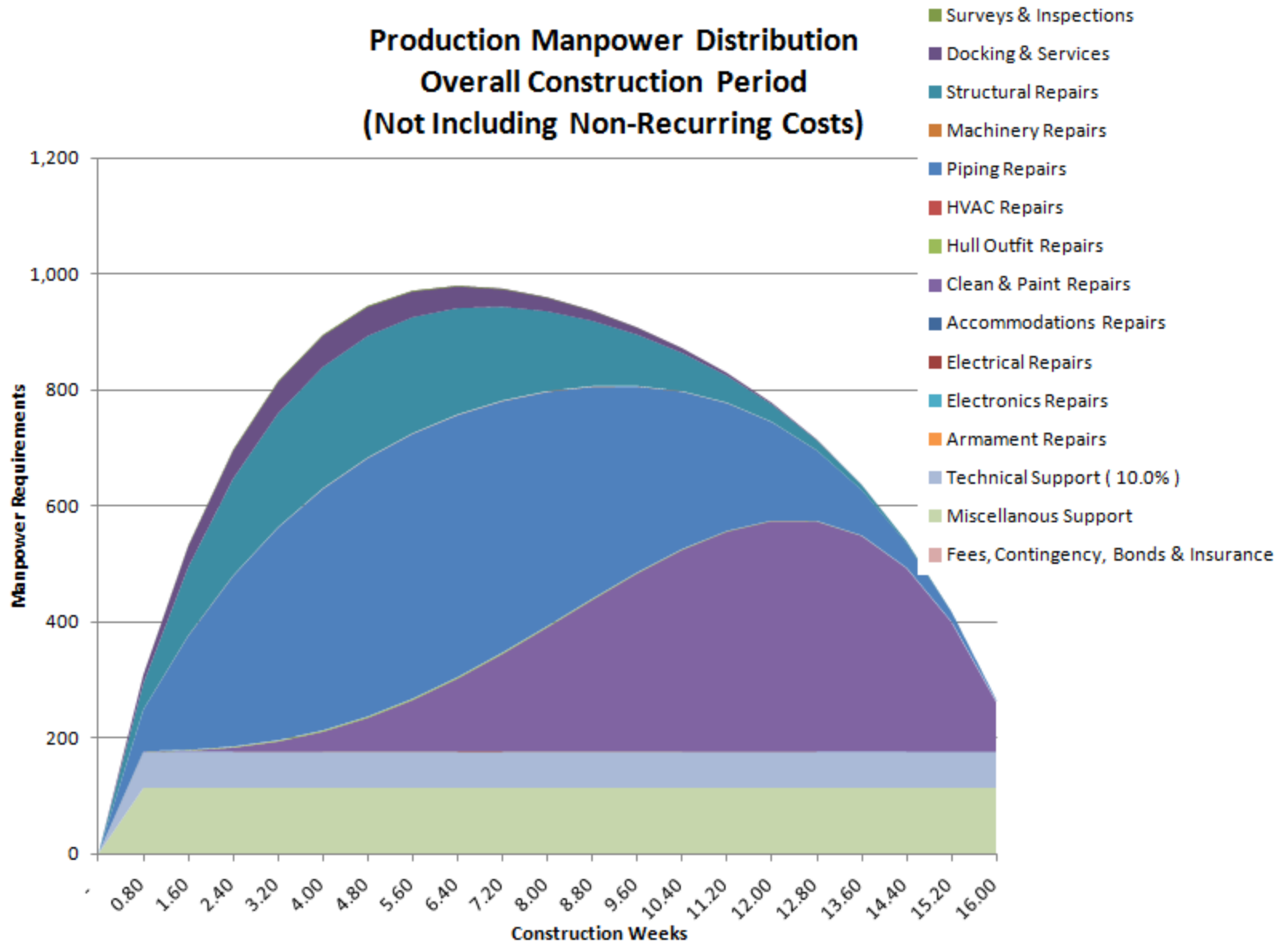
Est. Construction/Technology Risk:	\$ 2,202,860
Estimated Overlap Rework Risk:	\$ -
Est. Shipyard Experience Risk:	\$ 21,100,545
Est. Engineering Performance Risk:	\$ 19,330,395
Production Schedule Cost Risk:	\$ 3,536,301
Total Risk	\$ 46,170,101
Total Price with 100% Risk:	\$ 101,558,483
Total Price with 20% Risk:	\$ 64,622,402

\$ 9,234,020 20% Cost Risk

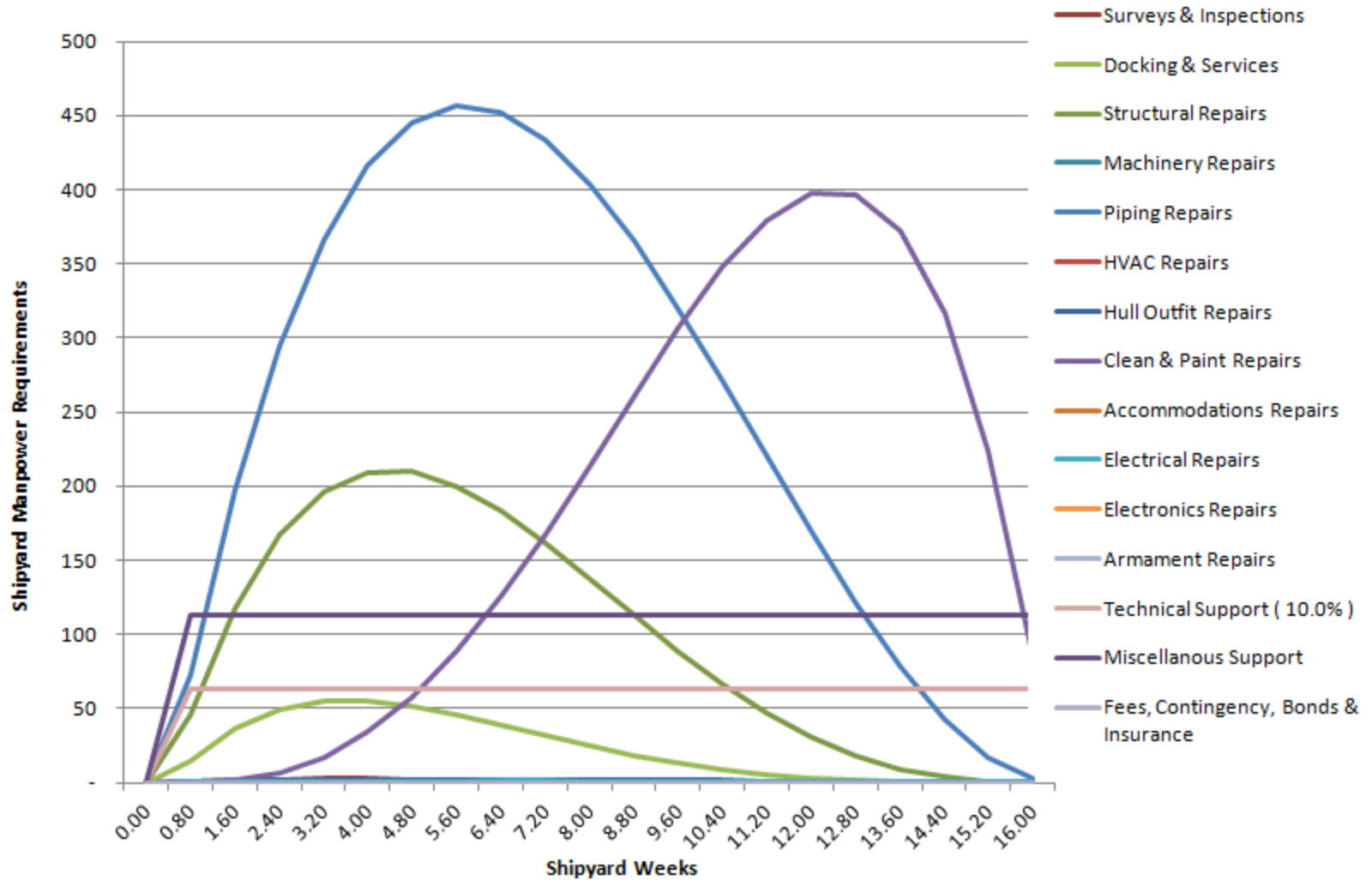
Shipyards Labor Hours



Production Manpower Distribution Overall Construction Period (Not Including Non-Recurring Costs)



Shipyards Manpower Requirements Over Shipyards Period



The Cost Model keeps track of all the estimate cost items (“Contents” worksheet) that are available within the cost model and a count of items that are actually being used in the detail worksheets to generate an estimate.

Note that the Cost Model offers hyperlinks to quickly jump from one worksheet to another.

		<u>No. Cost Items</u>	<u>Used For</u>	<u>Used For</u>
3-0	Cost Estimate Details	<u>Available</u>	<u>Labor</u>	<u>Material</u>
3-1	Surveys & Inspections	6	1	1
3-2	Docking & Services	130	5	21
3-3	Structural Repairs	-	-	-
3-4	Machinery Repairs	62	5	1
3-5	Piping Repairs	-	-	-
3-6	HVAC Repairs	12	-	-
3-7	Hull Outfit Repairs	93	14	11
3-8	Clean & Paint Repairs	136	27	16
3-9	Accommodations Repairs	422	-	-
3-10	Electrical Repairs	326	14	-
3-11	Electronics Repairs	-	-	-
3-12	Armament Repairs	-	-	-
3-13	Technical Support	8	4	1
3-14	Miscellaneous Support	20	7	6
3-15	Fees, Contingency, Bonds & Insurance	25	-	11
		1,240	77	68

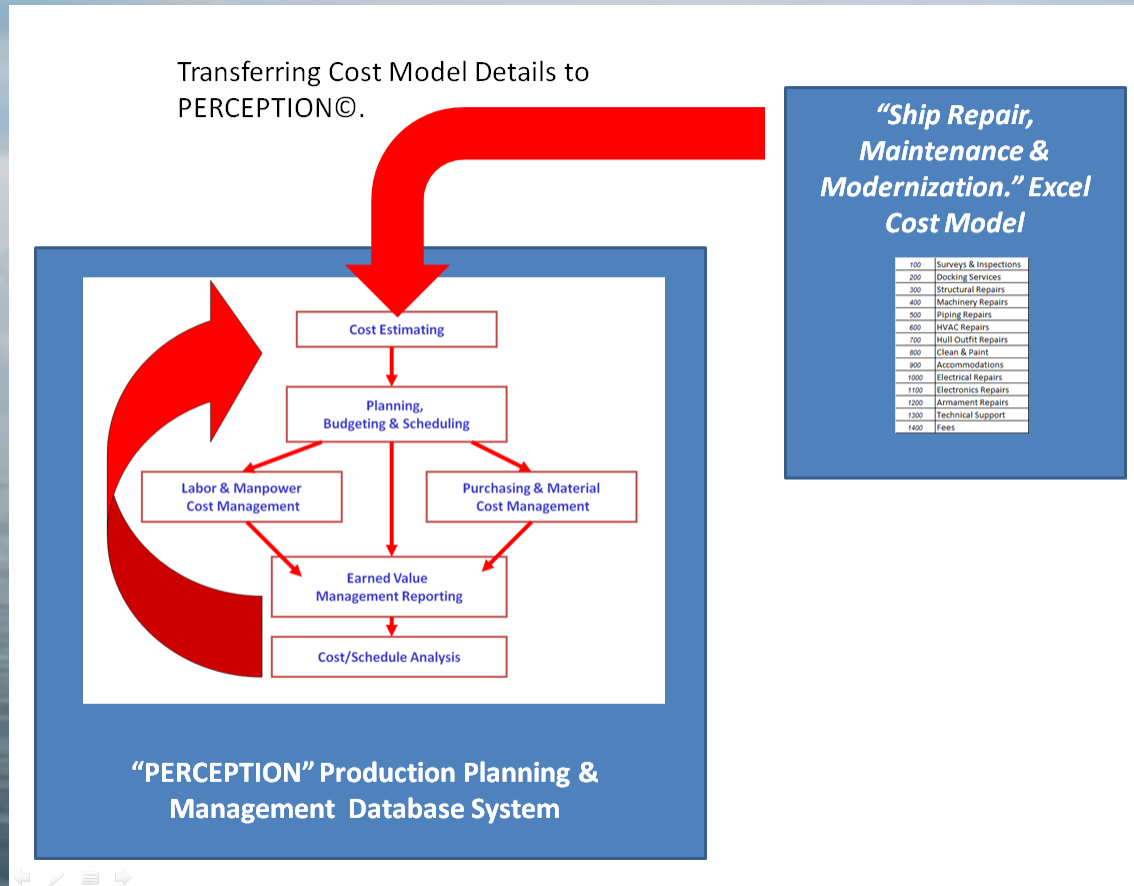
Ship Repair, Maintenance & Modernization Cost Model

Sample Ship Repair - M/V Houston			Enter Ship Name
			Metric Units
HULL			
LOA, Length Overall	187.45	M	
LWL, Length Waterline	187.45	M	default LWL=LOA if not known
Beam, Molded	27.43	M	
Depth, Molded	16.61	M	
Draft, Design Full Load, Molded	10.97	M	
Cubic Number (LWL x Beam x Depth)	85,420	CUNO(M)	
SVI, Ship Volume Indicator (LWL x Beam x Draft)	56,424	M3	
WEIGHTS			
Total Displacement at Full Load Draft	47,953	MTON	
Light Ship Weight	9,459	MTON	
Fuel & Load Items	-	MTON	
Gross Registered Tons (GRT)	27,798	GRT	
Net Tonnes	13,660	NET	
DWT	32,573	MTON	
CARGO CAPACITY			
Total Cargo Deck Space	-	SQM	
Number of TEUs	-	TEU	
Number of Vehicles at Capacity	-	NO.	
Number of Passengers	-	NO.	
Total Cargo Capacity	-	M3	
Liquid Cargo Capacity	-	BBL	
Bulk Cargo Capacity	-	MTON	
ACCOMMODATIONS			
Ship's Civilian Crew Number	12	CREW	
Number Commissioned Officers	-	CREW	
Number Non-Commissioned Officers	-	CREW	
Number Enlisted	-	CREW	
Number Troop Force	-	CREW	
Number Overnight Passengers	-	PAX	
Total Accommodations	12		

The “Ships Characteristics” worksheet provides for general information about the ship to be repaired. A number of CERs within the various detail cost worksheets can be linked back to this information.

The cost estimate generated within the Cost Model can be downloaded to SPAR's **PERCEPTION**® database system for additional reporting and detail estimating functions.

PERCEPTION is an optional software system that has options beyond cost estimating: production planning & scheduling; purchasing & material control; work order development & time charge management; earned value project management reporting of progress, cost and schedule forecasts; links to financial & accounting systems; links to CAD systems; etc.



PERCEPTION offers many different report formats and levels of detail.
Below are samples.

07/20/2012 13:12:20		SPAR Associates, Inc.						Page 1 of 3			
(Date format: MM/DD/YYYY)		Cost Item Listing by SWBS Groups(CI02)									
		Project Range: Repair to Repair		Group Range: 0 to ZZZZZZZ							
Cost Item	Description	Qty	UoM	Labor CER	Mat'l CER	Labor Hours	Labor Cost	Material Cost	Extended Cost	Last Updated	
Project Repair SPAR Repair Cost Model											
Group 2 - Docking-Services		0.00									
200.19	Warfaae	300.00	LOA FT/D	0.0000	1.2900	0	0	1,934	1,934	06/14/2012	
200.25	Drydock Prep	300.00	LOA FT/D	0.0000	24.7400	0	0	7,424	7,424	06/14/2012	
200.26	Drydock Haul (First Day) and Launch (Last Day)	300.00	LOA FT/D	0.0000	24.7400	0	0	14,847	14,847	06/14/2012	
200.27	Drydock Layover (Follow-on Days)	300.00	LOA FT/D	0.0000	22.2700	0	0	33,412	33,412	06/14/2012	
200.28	Remove Docking Plugs	2.00	EA	0.0000	97.9800	0	0	196	196	06/14/2012	
200.30	Re-Install Docking Plugs	2.00	EA	0.0000	97.9700	0	0	196	196	06/14/2012	
200.86	Gas Free Certificates	1.00	EA	0.0000	461.8000	0	0	462	462	06/14/2012	
200.90	Shore power - maintenance - per day	0.00	DAY	2.0000	0.0000	20	467	0	467	06/14/2012	
200.95	Shore Power Usage	0.00	AMPS/DAY	0.0000	1.0300	0	0	7	7	06/14/2012	
200.96	Accommodation electric heaters, electricity fee per day per heater	0.00	EA/DAY	0.0000	7.7000	0	0	53	53	06/14/2012	
200.98	Heat lamps - maintain per day fee	0.00	EA/DAY	0.0000	7.7000	0	0	53	53	06/14/2012	
200.101	Lighting - temporary per day	0.00	DAY	16.0000	0.0000	154	3,670	0	3,670	06/14/2012	
200.122	Shore steam - boiler maintenance per day	0.00	DAY	8.0000	0.0000	77	1,835	0	1,835	06/14/2012	
200.123	Shore steam - boiler rental per month excluding fuel cost	1.00	MONTH	0.0000	10,775.3100	0	0	10,775	10,775	06/14/2012	
200.126	Shore steam - plant supply 70 PSI - per day	0.00	DAY	0.0000	738.8800	0	0	5,101	5,101	06/14/2012	
200.130	Sewage system - additional disposal per day	0.00	DAY	0.0000	153.9300	0	0	1,063	1,063	06/14/2012	
200.133	Debris removal per day	0.00	DAY	12.0000	0.0000	116	2,769	0	2,769	06/14/2012	
200.141	Fire main - fire watchman per day	0.00	DAY	0.0000	230.9000	0	0	1,594	1,594	06/14/2012	
200.150	Ganqway - watch - per day	0.00	DAY	0.0000	369.4400	0	0	2,551	2,551	06/14/2012	
200.178	Temporary services - miscellaneous	0.00	DAY	48.0000	3,587.8800	463	11,043	24,771	35,814	06/14/2012	
200.193	Marine Chemist	0.00	DAY	0.0000	618.7400	0	0	4,272	4,272	06/14/2012	
200.194	Competant Person	0.00	DAY	0.0000	103.1200	0	0	712	712	06/14/2012	
				Group: 2 Totals		830	19,784	109,423	129,207		
Group 3 - Structural Repairs		0.00									
300.165	Manual Welding - Aluminum Fillet	100.00	FT	0.0187	0.0000	2	53	0	53	06/14/2012	
300.166	Manual Welding - Aluminum Bevel & "V"	100.00	FT	0.0217	0.0000	3	62	0	62	06/14/2012	
				Group: 3 Totals		5	116	0	116		

Detail Cost Item Listing Displaying CERS

(Date format: MM/DD/YYYY)

Cost Item Value Report by SWBS Groups(CI14)

Contract CostModels - SPAR Cost Model Imports

Project Range: Repair to Repair Zone Range: 0 to ZZZZZZZZ Assembly Range: 0 to ZZZZZZZZ Department: 0 to ZZZZZZZZ
 Group Range: 0 to ZZZZZZZZ Outfit Zone Range: 0 to ZZZZZZZZ Sub Assembly Range: 0 to ZZZZZZZZ Process: 0 to ZZZZZZZZ
 Account Range: 0 to ZZZZZZZZ Unit/Block Range: 0 to ZZZZZZZZ MGF Part Range: 0 to ZZZZZZZZ Trade: 0 to ZZZZZZZZ
 Work Center Range: 0 to ZZZZZZZZ CLINs Range: 0 to ZZZZZZZZ Planned Start: 01/01/1950 to 01/01/2050

Cost Item	Description	Labor Hours	Labor Cost	Material Cost	Direct Cost	Taxes	Indirect Cost	Total Cost	Profit	Total Price
Project Repair - SPAR Repair Cost Model										
Group 2 - Docking-Services										
Center SY - Shipyard Production Departments										
200.19	Warfare	0	0	1,934	1,934	0	116	2,050	308	2,358
200.25	Drydock Prep	0	0	7,424	7,424	0	445	7,869	1,180	9,050
200.26	Drydock Haul (First Day) and Launch (Last Day)	0	0	14,847	14,847	0	891	15,738	2,361	18,098
200.27	Drydock Lavover (Follow-on Days)	0	0	33,412	33,412	0	2,005	35,417	5,313	40,729
200.28	Remove Docking Plugs	0	0	196	196	0	12	208	31	239
200.30	Re-Install Docking Plugs	0	0	196	196	0	12	208	31	239
200.86	Gas Free Certificates	0	0	462	462	0	28	490	73	563
200.90	Shore power - maintenance - per day	20	467	0	467	0	747	1,214	182	1,397
200.95	Shore Power Usage	0	0	7	7	0	0	7	1	9
200.96	Accommodation electric heaters, electricity fee per day per heater	0	0	53	53	0	3	56	8	65
200.98	Heat lamps - maintain per day fee	0	0	53	53	0	3	56	8	65
200.101	Lighting - temporary per day	154	3,670	0	3,670	0	5,872	9,542	1,431	10,973
200.122	Shore steam - boiler maintenance per day	77	1,835	0	1,835	0	2,936	4,771	716	5,486
200.123	Shore steam - boiler rental per month excluding fuel cost	0	0	10,775	10,775	0	647	11,422	1,713	13,135
200.126	Shore steam - plant supply 70 PSI - per day	0	0	5,101	5,101	0	306	5,407	811	6,218
200.130	Sewage system - additional disposal per day	0	0	1,063	1,063	0	64	1,127	169	1,296
200.133	Debris removal per day	116	2,769	0	2,769	0	4,430	7,200	1,080	8,279
200.141	Fire main - fire watchman per day	0	0	1,594	1,594	0	96	1,690	253	1,943
200.150	Gangway - watch - per day	0	0	2,551	2,551	0	153	2,704	406	3,110
200.178	Temporary services - miscellaneous	463	11,043	24,771	35,814	0	19,155	54,969	8,245	63,214
200.193	Marine Chemist	0	0	4,272	4,272	0	256	4,528	679	5,208
200.194	Competant Person	0	0	712	712	0	43	755	113	868
Group: 2 Totals		830	19,784	109,423	129,207	0	38,219	167,426	25,114	192,540
Group 3 - Structural Repairs										
Center SY - Shipyard Production Departments										
300.165	Manual Welding - Aluminum Fillet	2	53	0	53	0	85	139	21	160
300.166	Manual Welding - Aluminum Bevel & "V"	3	62	0	62	0	100	162	24	186
Group: 3 Totals		5	116	0	116	0	185	301	45	346

Detail Cost Item Listing Displaying Extended Costs

07/20/2012 13:16:22

(Date format: MM/DD/YYYY)

SPAR Associates, Inc.

Page 1 of 2

SWBS Group Summary Report (SUM02)

Contract CostModels - SPAR Cost Model Imports

Project Repair - SPAR Repair Cost Model

Project Range: Repair to Repair Group Range: 0 to ZZZZZZZZ

Group	Description	Labor Hours	Labor Cost	Material Cost	Direct Cost	Taxes	Indirect Cost	Total Cost	Profit	Total Price
2	Docking-Services	830	19,784	109,423	129,207	0	38,219	167,426	25,114	192,540
3	Structural Repairs	5	116	0	116	0	185	301	45	346
5	Piping Repairs	952	22,686	2,643	25,329	0	36,456	61,786	9,268	71,053
8	Clean & Paint	515	12,277	11,858	24,135	0	20,355	44,490	6,674	51,164
13	Technical Support	253	7,236	25,000	32,236	0	13,077	45,313	6,797	52,110
14	Fees	322	7,673	335,738	343,411	0	32,422	375,833	56,375	432,208
	Project: Repair Totals	2,877	69,772	484,662	554,434	0	140,714	695,148	104,272	799,420
	Contract: CostModels Totals	2,877	69,772	484,662	554,434	0	140,714	695,148	104,272	799,420

SWBS Summary Cost Report



Estimate Date

07/20/2012

TO CUSTOMER

SPAR Associates, Inc
927 West Street
Annapolis MD 21401 USA

ESTIMATE

PROPOSAL FROM

SPAR Associates, Inc.
927 West Street
Annapolis MD 21401 USA

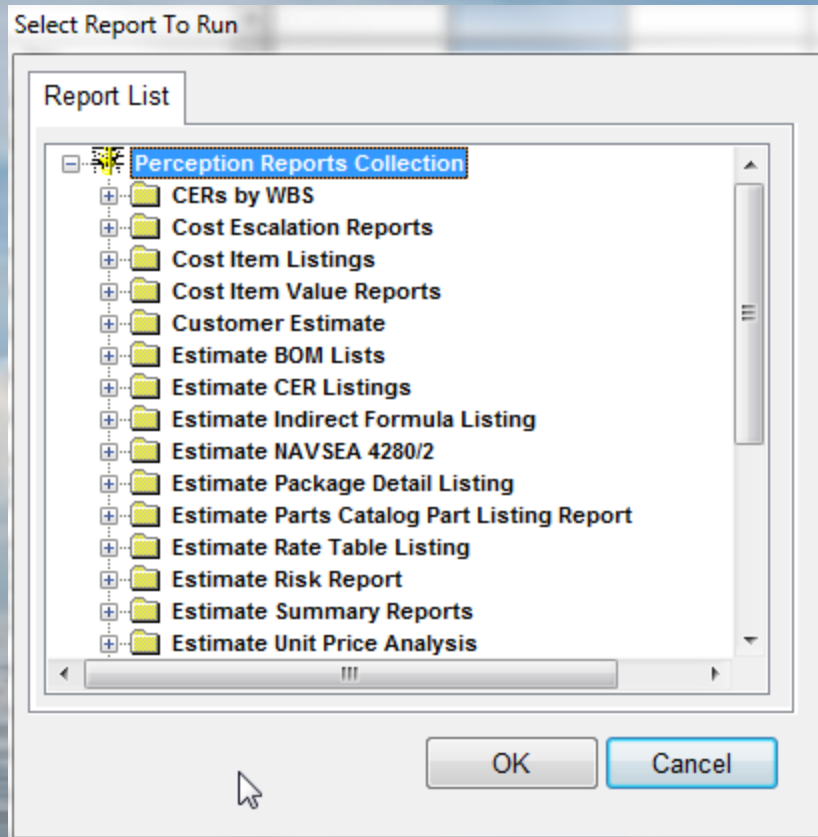
Contract CostModels - SPAR Cost Model Imports

Project Repair - SPAR Repair Cost Model

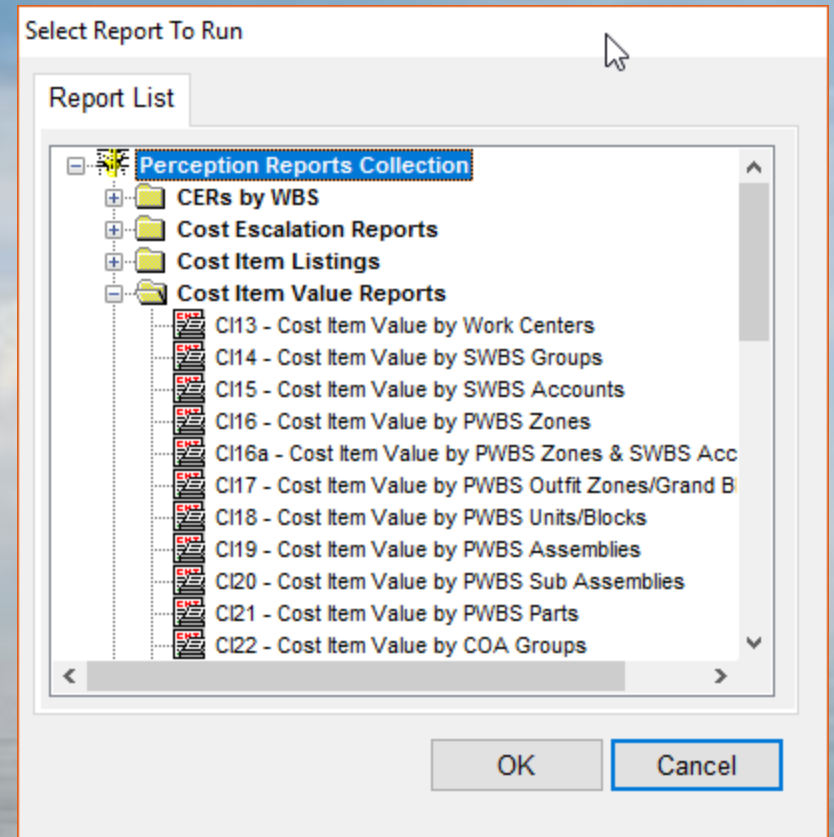
Cost Item #	Quantity	UoM	Description	Unit Price	Extended Cost
<u>Account 200</u>			<u>Docking-Services</u>		
200.19	300.00	LOA FT/D	Warfage	7.86	2,357.55
200.25	300.00	LOA FT/D	Drydock Prep	30.17	9,049.86
200.26	300.00	LOA FT/D	Drydock Haul (First Day) and Launch (Last	60.33	18,098.49
200.27	300.00	LOA FT/D	Drydock Layover (Follow-on Days)	135.76	40,729.23
200.28	2.00	EA	Remove Docking Plugs	119.46	238.92
200.30	2.00	EA	Re-Install Docking Plugs	119.46	238.92
200.86	1.00	EA	Gas Free Certificates	563.18	563.18
200.90		DAY	Shore power - maintenance - per day	2.00	1,396.54
200.95		AMPS/DAY	Shore Power Usage	1.03	8.53
200.96		EA/DAY	Accommodation electric heaters, electricity	7.70	64.61

Customer Cost Estimate Report

PERCEPTION offers many different report formats and levels of the cost estimate.



Selections of Report Categories



Reports within Category Selections

PERCEPTION, which uses an SQL relational database, can be accessed by third party report writers (e.g., Crystal).

Reports also can be downloaded in Microsoft Excel and pdf formats

Accuracy

How accurate are the cost estimating relationships (CERs)? As accurate as possible considering they have been compiled from known costs. Nevertheless, a prudent user of the cost model will review the results from the model to ensure they reflect your own cost experience and appropriately fit the specific requirements for the project being estimated. No cost fits all jobs. Good estimates are custom made for a particular project and for particular contractor through judgment, analysis and experience.

The cost model will generate preliminary estimates, to cross-check costs from other sources and from subcontract bids and when no actual costs are available. The cost model will reduce the chance of error or omission on estimates, speed “ball park” estimates, and be a good guide when there is no time to get quotes.

Users are expected to adjust the applied cost and pricing data so that they reflect more accurately the cost and price performance anticipated for a specific shipyard.

User Caution

Users of a cost model are cautioned that it is intended to provide only an estimate of cost information. There are limits to the capabilities of these calculations beyond which results may not be accurate.

The data provided in the cost model is not a substitute for judgment, analysis and sound estimating practice. The cost model is an aid in developing an informed opinion of cost. If you are using the cost model as your sole cost authority for contract bids, you are reading more into the cost model than what has been intended.

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