

# SPAR Scuttlebutt

January 2013

## SPAR's Cost Models

### **Design, Engineering & Construction Cost Models**

SPAR's continues to develop its new construction cost models to offer more design and system selection options.

Added to the features is a very quick and easy-to-use function for scheduling follow ships of a multi-ship construction program. The estimator estimates the shipbuilding labor learning cost curve, the expected reductions in overall ship construction time for each follow ship from start to delivery and also any planned overlaps of each ship's schedule with the previous ship in the series. The cost model displays the results in a visual chart presentation overlaid with an estimate of the overall labor time phased manpower requirements for the entire production program. Very simple changes in these scheduling parameters allow the estimator to set overall program manpower requirements to any level required.

These cost models further generate estimates of cost risk based on expected levels of engineering, shipyard, and schedule performance criteria.

These models are available for both commercial and naval ship designs; mono-hulls, catamarans and trimarans.

Each model provides a wide selection of propulsion power systems, structural materials, equipment/machinery, auxiliary, and outfit systems.

A pdf [presentation](#) and the [user manual](#) for the cost model are available for download from the [spar website](#).

### **Naval and Coast Guard Ship Life Cycle Cost Model**

The Naval Ship Life Cycle Cost Model extends the Ship Design & Construction Cost Model described above by estimating costs for operations, repairs, maintenance and upgrades over the life of the ship.

LCC Cost Summary	Average Cost/Annum	\$/Annum	\$/OPS Hour
Average Capital Cost	\$	5,107,942	\$ 2,554
Manning	\$	12,120,661	\$ 6,060
Manning TAD & PCS	\$	247,360	\$ 124
Manning Training	\$	989,442	\$ 495
Fuel	\$	4,817,546	\$ 2,409
Stores & Supplies	\$	480,597	\$ 240
Maintenance & Repairs	\$	1,880,405	\$ 940
Modernization & Upgrades	\$	2,519,111	\$ 1,260
Casualty Repairs	\$	12	\$ 0
Engineering & Technical Service	\$	-	\$ -
Miscellaneous	\$	-	\$ -
Decommissioning/Disposal	\$	-	\$ -
Total \$ per Annum	\$	25,643,952	\$ 14,082

This cost model uses a unique method for estimating maintenance, repairs, & modernization costs. Data entries define each of these cost segments for the primary ship systems (structure, propulsion, electric generation, electrical systems, electronics, auxiliary systems, outfit systems, and coatings. For each of the system categories the estimate is broken down into basic stages: regular maintenance and major refit cycles. Where estimated costs are not known directly, the estimator can

define these costs as a percentage of the original construction cost provided by the design & construction sections of the cost model.

Finally, the cost model estimates operational hours and costs lost from maintenance, repairs, and modernization. special features expedite estimating C4 software costs for cyclic refreshing and replacement activities throughout the course of a ship's life time.

The cost model is designed to support engineering and operations trade-off studies to minimize life cycle costs and minimize lost time and cost of operations

The data from the cost models can be transferred to the *PERCEPTION ESTI-MATE* database system automatically for additional reports and adding detail bills of material.

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### **Commercial Ship Life Cycle & Required Freight Rate Cost Model**

The Commercial Ship Life Cycle Cost Model extends the Ship Design & Construction Cost Model described above by estimating costs for capital investment, operations, repairs, maintenance and upgrades over

*"Over 40 Years of Providing Planning & Production Management Systems to Shipyards"*

the life of the ship. In addition, the cost model provides features for defining a commercial trade route between two or three different ports with transfers of container and/or trailer cargo at each port identified.

The cost model provides breakdowns of port charges for the ship and to load and unload its cargo. The cost model is designed to support trade-off studies of trade routes and operational characteristics so that costs can be minimized for lower required freight rates in a competitive trade industry.

The data from the cost models can be transferred to the *PERCEPTION ESTI-MATE* database system automatically for additional reports and adding detail bills of material.

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### Ship Repair, Maintenance & Modernization Cost Model

To expand beyond its selections of design and construction and life cycle cost models, SPAR has introduced its new cost model for ship repair, maintenance and modernization.

This new cost model provides a wide range of typical ship repair and maintenance activities (ship yard services and production processes) 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 15 group work breakdown structure as shown in the following figure.

	RSWBS
	Group
<a href="#">Surveys &amp; Inspections</a>	100
<a href="#">Docking &amp; Services</a>	200
<a href="#">Structural Repairs</a>	300
<a href="#">Machinery Repairs</a>	400
<a href="#">Piping Repairs</a>	500
<a href="#">HVAC Repairs</a>	600
<a href="#">Hull Outfit Repairs</a>	700
<a href="#">Clean &amp; Paint Repairs</a>	800
<a href="#">Accommodations Repairs</a>	900
<a href="#">Electrical Repairs</a>	1000
<a href="#">Electronics Repairs</a>	1100
<a href="#">Armament Repairs</a>	1200
<a href="#">Technical Support ( 10.0% )</a>	1300
<a href="#">Miscellaneous Support</a>	1400
<a href="#">Contingency, Bonds &amp; Insurance</a>	1500
<b>Ship Totals:</b>	

The cost model provides the following features:

- The cost model is an Excel Workbook that is familiar to operate and easy to use.
- Over 1400 repair cost items available for selection
- Capability to add additional cost items as needed
- Capability to modify existing cost items as experience indicates
- Capability to pick and choose cost items as required for most any ship repair, maintenance and/or modernization scope of work.
- Automatic escalation of all material costs to a common year. Each material cost item is linked to its individual commodity-based escalation table to help keep material costs current and to provide reasonable forecasts of material costs into the future.
- Ranges of shipyard productivity factors to match expected work performance.
- Unique cost risk assessments based on expected levels of engineering, shipyard, and schedule performance criteria.

## SPAR Scuttlebutt

Models are available for both metric units of measure as well as US units.

Reports are provided in graphical and tabular formats, breaking out labor and material costs. An estimate of shipyard manpower requirements is also generated by the cost model.

The data from the cost models can be transferred to the *PERCEPTION ESTI-MATE* database system automatically for additional reports and adding detail bills of material.

A pdf [presentation](#) and the [user manual](#) for the cost model are available for download from the [spar website](#).

### **PERCEPTION, An Integrated Shipyard ERP/EVM System**

*PERCEPTION* is SPAR's system that links and integrates information across most business areas of the shipyard: cost estimating; planning & scheduling; work orders & time charge management; purchasing & material control; and cost/schedule/progress reporting & forecasting.

*PERCEPTION* interfaces with financial and accounting systems (payroll, HR, accounts receivable, payables, and general ledger) as well as popular ship design and engineering software systems.

A major benefit from using *PERCEPTION* is its ability to measure directly cost and schedule performance not only

by contract work breakdown structure, but perhaps more importantly by shipyard work centers. Keeping management informed not only of what has transpired so far, but trends and forecasts of where performance is most likely to go toward the end of contracts.

Clarity of real cost and schedule performance provides management more time to identify and correct production problems before they fester and sink a successful contract.

## **PERCEPTION,** **also Benefits the** **Ship Repair** **Business**

*PERCEPTION* streamlines the process of going from ship owner request for proposal (RFP) to shipyard proposal (cost estimate) and upon contract award, immediate generation from the proposal data to budgeted material requisitions and production work orders. The purchasing, expediting and material control functions of the system all flow directly from the requisitioning information. The system collects time charges against contract work orders.

Cost and schedule status reports track costs against the proposal and original /modified budgets (contract cost management reporting).

At the end of the contract, the system will generate customer invoices according the proposal (editable) with or without change orders. Charges may be invoiced as milestones and/or actual time and materials that are linked to the given contract

rate tables (labor rates, overhead, profit, and material markups).

## **Cost Estimating** **Services**

SPAR provides cost estimating services for ships: new construction, ship repair, maintenance, modernization and for life cycle operations. SPAR has developed various cost models that address the requirements of all these activities. SPAR has provided independent cost estimates for design agents, shipyards, shipping companies, and for government agencies (U.S. Navy, USCG and for MARAD).

SPAR's cost estimating includes assessments of cost risk from technical, design and engineering, build strategy and shipyard management and production performance points of view.

SPAR's more recent cost models provide various options for minimizing life cycle costs via selections of alternative ship systems, changes in ship mission requirements, and differences in build strategies. These cost models generate estimates of cost implications for maximizing material readiness and achieving or exceeding service life.

Cost model options also are available for estimating costs and benefits of various "green" sub-systems that can be included in the design and operation of the ship. Options now are available for estimating costs to design/build or convert existing engine operations to use LNG fuel.

## **SPAR Scuttlebutt**

### **SPAR Expands** **Marketing Reach**

SPAR recently signed an agreement with the company ABM Global Solutions Pte. Ltd. in Singapore to market SPAR products in Singapore, Malaysia, Indonesia and Philippines. This arrangement expands SPAR's marketing presence in Southeast Asia.

Other SPAR representatives in the Asian market are located in Thailand, Republic of Korea, and China.



SPAR has enrolled with the Department of Homeland Security's E-Verify program. All new SPAR employees working on Federal contracts will require a Work Authorization from E-Verify.

### **SPAR Web Site** **Updates**

SPAR's web site, [www.sparusa.com](http://www.sparusa.com), has been updated in a number of areas. Added are a series of new training documents for its *PERCEPTION* integrated shipyard planning and management system

### **SPAR Associates,** **Inc.**

SPAR has been providing shipyard production planning and management control software since 1972. In addition to its software

products, SPAR offers a variety of support services, including custom software design and development; training and software maintenance services; independent cost estimating; supplemental shipyard planning and scheduling services; and management consulting to various interests in the marine industries.

We are always available to address whatever questions that you might have. Your success is ours.

## **SPAR** **Publications**

SPAR offers free downloads of its software user manuals, user

tutorials and product/service presentation from its web site [www.sparusa.com](http://www.sparusa.com).

In addition, SPAR has the following publications available for order to help shipyards plan and manage their operations:

- **"Estimating Coating Costs for Ships: Simple Methods for Estimating Ship Surface Areas"**  
(US \$50.00)
- **"Planning New Construction & Major Ship Conversion"**  
(US \$75.00)
- **"Shipyard Cost Estimating"**  
(US \$125.00)
- **"Guide for Shipyard Material Control"**

(US \$75.00)

- **"Full Implementation of a Shipbuilder's Earned Value Management System (EVMS)"**  
(US \$75.00)
- **"Comparing Methods of Measuring Progress, Earned Values & Estimates at Completion (EAC)"** *FREE*
- **"Expanded Modularization, Ship Design & Construction"**  
(US \$75.00)

All publications are available in pdf file format via electronic mail.

Publications requiring purchase are processed on the web site via PayPal.

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