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# SPAR Scuttlebutt

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May 2011

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**It has been a while since our last newsletter. So, to bring us up to date,.....**

## **SPAR's Cost Models**

Recent changes to SPAR's cost models include the following:

1. The selection of structural assemblies has been expanded significantly. Each has been programmed for its own specific production costs (labor hours per ton) appropriate to the specific manufacturing and assembly processes normally involved.
2. All commodity-based escalation tables have been updated and with revisions of forecast future year cost factors.
3. A productivity factor that is a measure of ship outfit density has been added. The greater the density, the higher the factor and the expected labor costs to install. Military vessels are typically more heavily packed with systems and equipment within limited ship spaces; this is one reason that naval ships carry premium price tags compared to commercial vessels.
4. Outfit density also is a measure of the detail non-recurring engineering requirements. The cost

models now provide automated estimates for non-recurring labor hours based on the outfit density and the size of the ship. The estimator may substitute a manual estimate to account for added technical efforts beyond the assumptions made for the automated estimate.

SPAR has developed its cost models since the late 1990's. These models have been applied to a wide variety of hull forms (mono-hulls, catamarans and trimarans) and for different commercial, military and dual-use missions.

## **ESTI-MATE™ Gets a New Facelift**

*ESTI-MATE* (aka *PODAC Cost Model*), which is a module (or stand-alone) of SPAR's *PERCEPTION®* system, operates on a central database where there are various catalogues for storing shipbuilding and ship repair production rates and productivity factors, each with its own unit of measure. These cost estimating relationships (CERs) can be simple man-hours and/or material costs per meter or foot of length, or more complex equations of multiple variables (for example, man-hours per meter and pipe diameter. These equations can

use almost any number of different mathematical functions and variable relationships.

Another feature of the system is a catalog for standard work packages that can contain any number of CER line items, each assigned to different trades/crafts/work centers. These line items can reference CERs from the CER catalogs described above; they also can reference costs managed by the system's parts catalog. There is a lot of flexibility in use of the system.

The system can accept data from various other systems, including Excel, CAD and other ERP systems. *ESTI-MATE* also has features for automating the transition from an estimate to a production plan including preliminary work orders and material requisitions that are processed by other modules in the *PERCEPTION* system.

The system supports the multi-level work breakdown structures. Any project (contract) set up on the system may have its own unique WBS. Large-scale projects may have multiple sections that will roll up for a total bid package. For example, non-recurring design and engineering and construction can be set up into separate projects that roll up for a total contract package. This feature also facilitates projects for multiple ship programs under a single contract package.

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Since the system supports multiple WBS structures simultaneously, a standard internal shipyard WBS may be established, while still addressing the requirements of a ship owner's own WBS for reporting purposes.

The latest upgrade of *ESTI-MATE* greatly simplifies the use of the system as well as improves upon its estimating capabilities.

## **Cost Estimating Services**

SPAR continues to provide independent cost estimating services to various clients, including Navy and USCG contractors; shipyards; naval architects and marine engineers, both domestic and foreign.

SPAR has been assisting Herbert Engineering Corp., of Annapolis, MD and Alameda, CA focusing mostly on estimating capital costs (CAPEX) and operating costs (OPEX) and determining required freight rates (RFR) for a range of ship designs being developed for American Marine Highways, including special options for multi-use Navy Defense Funding. Some of this work has been performed for the Center for the Commercial Development of Transportation Technologies (CCDoTT) under the Office of Naval Research (ONR) funding as well as other projects for the Maritime Administration (MARAD). SPAR's efforts are helping determine the economic feasibility of these ship designs for East or West Coast container and/or RO-RO transportation markets as alternatives to

trucking on increasingly congested Interstate highways. These designs cover the gamut of ship types: mono-hulls, trimarans, seatrains, and ATBs.

SPAR also has provided pro bono cost estimates in support of academic programs at University of New Orleans (catamaran patrol boat) and the University of Michigan (ice breaking subsea construction, maintenance and repair vessel).

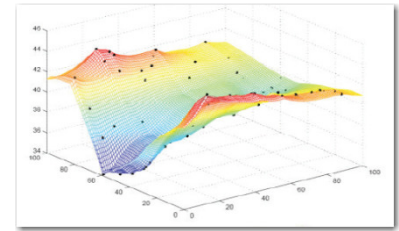
On the non-commercial front, SPAR's cost estimating has supported engineering trade-off studies for the up-coming USCG Offshore Patrol Cutter (OPC) and estimates for military fast patrol vessels constructed of steel and of aluminum for possible foreign export.

Finally, SPAR provided costs in support of various offshore power energy generation systems. Using SPAR's extensive libraries of detail production process costs, the cost estimates detailed the industrial fabrication processes for the many structural components.

## **SPAR's Cost Model Integrated within CSC's ModelCenter**

CSC has developed a Multilevel Hierarchical System (MLHS) to the ship design process which integrates various ship design and analysis tools. These design tools range at different levels of detail and focusing on various important areas of a ship design's evolution in order to determine an optimized set of design characteristics.

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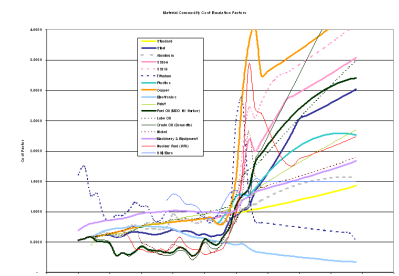


SPAR's cost model was successfully integrated within CSC's ModelCenter systems that also link, among others, the Navy's ASSET design system. A demonstration of this integrated system was successfully completed for evaluating the operational and cost benefits for a proposed new Navy oiler, the T-AO(X).

## **New Construction & Ship Repair Cost Libraries**

SPAR's extensive cost libraries have been updated and are ready for 2011 cost estimating. The upgrades include revised commodity-based escalation tables that reflect current changes in prices for materials (steel, aluminum, paint, copper, fuels, etc.) and equipment.

European machinery, electronic & equipment prices have been linked to the latest U.S. dollar to Euro and to British pound exchange rates.



*Time-Phased Commodity-Based Escalation Tables*

These cost libraries are available for purchase either in the form of Excel workbooks or pre-loaded into SPAR's *PERCEPTION® ESTI-MATE®* cost estimating system and database.

## **SPAR Expands its Marketing Potential in China**

In 2006, China's highly regarded Harbin Engineering University purchased a license of SPAR's *PERCEPTION* system to both localize for use in China and to integrate within the university's ship design and construction academic programs. Recently, the university purchased SPAR's commercial shipbuilding cost estimating relationship (CER) libraries and a specialized parametric cost model that SPAR has developed for estimating costs to replace forebodies of bulk carriers.

As part of these new developments, SPAR has entered into a marketing agreement with Heilongjiang Real Link International Trade Co., Ltd. to introduce SPAR's products to the Chinese shipbuilding industry.

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

*PERCEPTION* is a 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.

### **What are the advantages for using the system?**

1. *PERCEPTION* provides a simple and direct means to plan work to better coordinate the shipyard's workforce, subcontractors and material requirements. Without a reasonable and achievable plan, there is always the high risk that costs will be greater than they should and schedules are more likely to not meet expectations. Cost over runs and schedule delays do not make for a happy ship owner, who then is more likely to limit future business with your shipyard.
  2. *PERCEPTION* provides a central database of information, eliminating duplicate data entries and providing consistent information across all shipyard functions: estimating; planning; purchasing, receiving, and production material control; and production process departments. This allows quick and direct cross referencing of various inter-departmental transactions to ensure material and workforce requirements are available when scheduled for the most efficient early stages of construction.
  3. *PERCEPTION* provides real-time cost and schedule information. This gives management immediate access to important status of your projects when problems need to be recognized and resolved quickly. Untimely information will lead to higher costs and schedule delays when too much time is wasted to implement remedial
- actions. Real-time cost reporting that includes not only actual expenditures, but also committed costs for purchases not yet invoiced by vendors are a very important feature for ship repair contracts.
4. *PERCEPTION* employs specialized earned value management ("EVM") reporting analysis that accurately informs management of actual work progress and the full status of costs and schedules at all levels of each projects from summary levels down to the details when needed. These EVM features also forecast final costs and schedules which an aware management will monitor to ensure any corrective actions being taken are proving successful or need redirection. These unique reporting features assess contract cost and schedule performance not only by contract, but also by shipyard work center; this lets management focus attention on each area of production to ensure each is performing as expected and identify areas that can be better streamlined to make the shipyard more competitive.
  5. *PERCEPTION* has been designed specifically for the shipbuilding/repair industry. It is not a product developed for other industries that lack the familiar and unique operating features of a shipyard. The system addresses the special differences between managing new construction and ship repair activities. The system also is effective in planning and managing industrial fabrication work as well as plant maintenance.

How much money will the shipyard save over what systems the shipyard presently uses?

Many smaller shipyard operations do suffer problems of having to rely on many different and isolated systems to process the necessary information to effectively run the operations. Unlike *PERCEPTION* which consolidates most of the shipyard's information processes in a single system, having to use multiple systems typically means information often is not timely, not consistent and cannot produce the quality of cost and schedule performance monitoring and analysis needed to keep management fully and effectively informed.

Also, relying strictly on accounting systems to do this work too often fails to address the real needs for planning and managing production. While accounting systems do the job of providing financial reports, making payroll and paying bills, they are not designed to pull together necessary planning information with production costs and to measure true production cost and schedule performance to ensure the shipyard maintains its competitive edge and maximizes the productivity of its work.

The system does not automatically promise benefits and more profitable results. It requires a fully committed shipyard management to implement the system correctly and to effectively act on the

planning and contract performance information generated by the system.

What are the disadvantages or difficulties in using the system?

Implementing the system is straight forward and requires minimal training. Because the system has been designed specifically for shipyards, it uses terminologies and procedures that are familiar and fairly common to the industry around the world. This is not a system that requires major changes in a shipyard's operations just to fit the shipyard to the requirements of a software system.

## **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;

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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 has the following publications available to help shipyards plan and manage their operations:

- **"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)

Publications are available in pdf file format via electronic mail.

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