
SPAR Scuttlebutt

September 2017

Royal Canadian Navy & Canadian Coast Guard

SPAR continues to support the Canadian Government by providing a third party review for the earned value management ("EVM") reporting of the non-combatant ships currently being built under the Canadian National Shipbuilding Procurement Strategy ("NSPS").

SPAR was awarded a three (3) year contract, with three option years, to provide Canada as represented by Public Works and Government Services Canada, with Earned Value Management support services during the construction of new government vessels: a series of three OFSV Offshore Fisheries Science Vessels, one OOSV Offshore Oceanographic Science Vessel, a series of three JSS Joint Support Ship fleet oilers, and a polar icebreaker. These ships are currently planned to be built at the Vancouver Ship Yard, Vancouver, BC.

SPAR continues to be an active participant in the EVM Integrated Product Team at the shipyard, reviewing shipyard EVM reports and data each week, providing independent EVM reports and forecasts each month using SPAR's shipbuilding *PERCEPTION®* ERP/EVM system, and providing briefings and attending meetings as required by the Canadian Government.

Looking For Cost Drivers

Designing and building a modern ship is a complicated business involving procurement of many different materials and subcontractors synchronized with various production fabrication, assembly and testing processes. Each of these elements need to be carefully planned and coordinated, and each adds to the cost of the final product: the ship.

Government agencies planning new shipbuilding programs are anxiously looking for how to satisfy their ship mission requirements within the limited funding levels available.

Commercial ship owners have financial objectives to meet the challenges of their business markets and maximize a return on investment.

Ship designers need to satisfy the ship owners ship performance requirements, and generate an engineered design that is more producible, easier and less costly to build. The management of the design and engineering processes further need to plan its efforts to directly support the shipbuilder and its ability to more efficiently execute the fabrication and assembly processes.

Shipbuilders need to offer ship products that can favorably compete against other shipbuilders on the open

markets and satisfy the general financial and construction requirements imposed by the customer. The shipbuilder further needs to review carefully steps to minimize cost and schedule risk: specifically, cost risks from potential problems with engineering and production performance.

All of these special interests place a very heavy focus on one single element that affects them all: cost

Within what typically is a limited time frame for cost evaluations, the prudent shipbuilder needs to at least review the costlier elements of its program proposal. These large cost items are called cost drivers, and their review can open up new opportunities to mitigate their costs, even open up innovation for applying new technologies and build strategies that can improve the program's overall price and/or improve the performance of the ship design in the water and reduce costs over the life of the vessel.

SPAR, a long-standing company, specializes its products and services on helping ship designers and shipbuilders better manage their costs. SPAR has authored a paper named "[Looking for Cost Drivers](#)". The discussion illustrates a many faceted approach to reviewing a program cost estimate and identifying what cost drivers are most significant. The discussion describes typical" hard cost

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

drivers” such as expensive machinery and equipment to “soft cost drivers” such as the producibility of the ship design and outfit density. Likewise, shipbuilder’s productivity and the cost/schedule performance of the engineering effort can be critical drivers of cost too.

Estimating Cost Models

ASC Pty Ltd of Australia purchased SPAR’s naval ship estimating cost model and the complimentary *PERCEPTION* cost estimating database system.

Lockheed Martin Corporation also has purchased SPAR’s naval ship estimating cost model as well as the complimentary *PERCEPTION* cost estimating database system.

SPAR offers a variety of cost models that focus on specific ship types (naval, commercial, mono-hull, catamaran and trimaran). The cost models produce estimates for design and construction with options for estimating life cycle costs.

The cost models are extensive Excel workbooks that provide a very wide range of equipment and ship system selections and options as well as a variety of structural materials including high strength steels, aluminum and composites. All material costs are linked to commodity-based escalation tables to provide consistent material costs relevant to the anticipated year for contract award. The cost models have been designed to provide quick cost estimates for various concept and preliminary design trade-off studies.

The models provide easy-to-use cost adjustments to accommodate the impact of design complexity, special operating requirements, and anticipated build strategy.

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

The cost models have options for estimating life cycle costs (“LCC”) using a unique approach for estimating operating, maintenance and repairs, and future upgrade costs. Extended features generate LCC estimates, including annual funding projections, not only for a lead ship, but also across a fleet of such vessels planned for the large acquisition program. A [presentation](#) of the LCC features can be viewed from SPAR’s web site.

EARNED VALUE MANAGEMENT PERFORMANCE REPORTING SERVICES:

SPAR provides earned value and management (EVM) reporting as an oversight service for new shipbuilding construction projects. Using the shipbuilder’s planning (budgets and schedules) and cost (labor and material) data, SPAR generates EVM reports from imports of the data into SPAR’s *PERCEPTION*® software system. From these reports, SPAR develops weekly and/or monthly narrative and graphical EVM reports that provide valuable insight into the

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shipbuilding cost and schedule performance for the program.

These reports can be generated not only at the total program summary level but also at any level of the work breakdown structure (WBS) including the stages of construction and the Product WBS.

With a skilled staff of analysts that have demonstrated EVM experience in the shipbuilding industry, SPAR generates these reports quickly and with the expertise expected from a third party technical expert. The analysis may identify cost and schedule issues that the shipbuilder’s management team must address before they escalate. Mitigation of these issues at an early stage and the ability to monitor them is essential to the success of the program.

Cost Estimating Contracts

SPAR has been awarded several more contracts to provide independent cost estimates and price to win services for designing and building various U.S. military vessels. These estimates were generated using SPAR’s parametric cost models, each customized to meet the requirements for the specific types of vessels being estimated.

On-Line Software Demos & Training

SPAR has provided a series of on-line software demos and training exercises to shipyards in Asia, India, the Middle East

and within the U.S. using the WebEx system over the Internet. WebEx provides a very clear and responsive transmission of on-line demonstration and training details, video and audio features between SPAR staff and shipyard personnel.

Estimating Higher Cost of High Outfit Density Ships

SPAR has been involved in a number of industry projects for developing new methods for planning and estimating ship design and construction.

SPAR has developed cost models that estimate the impact of ship outfit density on production costs. Ships packed with significant outfitting within very confined spaces tend to require many more labor hours to install, whether on board or even earlier on block. In addition, such heavily confined spaces often are more difficult for conducting operations and maintenance activities. They further severely limit the amount of space and weight margins available for future upgrades.

Modern European shipbuilders have been successfully working on solving these problems and are more often now producing

designs with larger hulls and outfit spaces. The larger ship volumes are reducing outfit labor hours, and better accommodate maintenance activities and future upgrades.

The added cost for larger ship structures is often much smaller than the resulting cost savings in construction and life cycle.

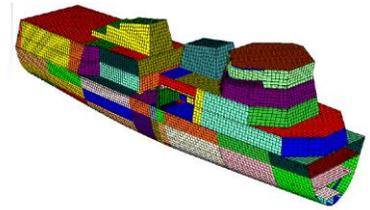
New ship volume density functions related to production labor cost have been fully implemented as options within SPAR estimating cost models.

SPAR Awarded NSRP Project

The team of Fincantieri Marinette Marine, Leonardo DRS Technologies, U.S. Navy NSWC-CD Code 65, consultants Peter Jaquith and Robert Keane and SPAR has successfully been awarded a research and development contract by Naval Ship Research Program (NSRP).

The title of the project is "Ship Structural Design Optimization for Improved Producibility and Enhanced Life-Cycle Performance. The focus of the project is to exploit the optimizing features of the DRS "MAESTRO" ship structures design capabilities and extend these features to better address the shipbuilder's production facilities and efficiencies.

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SPAR's contribution will be to link its estimating cost models to MAESTRO to automate estimates of structural fabrication and assembly costs as well as SPAR's cost models features for estimating costs of coating systems throughout various areas of the ship.

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.

If you have corrections to your address or would like to add a name to our mailing list, please complete the following form and **Send To:** SPAR Associates, Inc.- 927 West Street- Annapolis, MD 21401,USA

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