



COMPANY BACKGROUND

Started in 1972, SPAR Associates, Inc. specializes in shipyard planning and operations management software applications. Specifically, these applications integrate cost estimating, planning and scheduling, purchasing, inventory control, labor work orders and time charge management, and multi-level job costing and earned value work performance reporting. They have been applied to both new construction and repair, commercial and military, domestic and foreign companies. SPAR further provides a variety of support services: independent cost estimating; project management; systems development and integration; training and management consulting.

SPAR employs a professional staff with extensive experience in state-of-the-art PC-based client/server SQL relational database and web-based applications. These systems are integrated with popular financial, desktop and CAD/CAE/CAM systems to provide easy-to-use and seamless management of information throughout a company's operation.

INDUSTRY KNOWLEDGE

Since 1972, SPAR has worked almost exclusively within the shipbuilding and repair industry in the United States, Canada and abroad (listing attached). Over this period of time, major advancements have been made in CAD and CAM systems. SPAR instead, has focused on shipyard planning and management systems. Major strides have been made towards improving production efficiencies by way of improved manufacturing and assembly facilities, but also in more productive ways to organize and execute work. Considerable cost savings have been achieved from modern shipbuilding methods including modular construction techniques, pre-outfitted hull blocks, zone outfit, and piece part manufacturing. SPAR systems have specialized features for supporting these methods and allowing the shipyard to recognize their benefits quickly and easily.

SPAR systems pioneered the earned value method of measuring production cost and schedule performance. This experience goes back to the company's early years of the 1970's when North American shipbuilders were beginning to recognize that foreign shipbuilders were achieving much lower production costs. SPAR's systems were developed to measure shipyard productivity and to better coordinate labor and material resources at earlier, more efficient stages of construction. With this capability, shipyard management is provided much more visibility of its costs and can react more quickly and effectively to correct problems long before they critically and adversely impact an otherwise successful contract. With an actively engaged management team, new cost saving ideas can be introduced and measured almost immediately, thus enabling the business to grow and become ever more competitive.

SPAR infused a special interest in developing its systems to be extremely flexible, a requirement to meet the constantly changing work and business environment of the shipyard industry. New construction requires good planning and management control, while repair work is more noted to be fast moving and highly variable in scope of work and time and resource requirements. ERP systems designed for other industries

are often too rigid and inflexible and therefore difficult at best to use. SPAR's systems were designed specifically for shipyards such that it fits its business needs directly. The software does not impose special constraints upon the shipyard's business practices, but helps the shipyard enhance its ability to improve its competitive position in the market place.

SPAR's primary source of business historically has been with small to medium size commercial shipbuilders (under 1,000 employees). SPAR also has worked with larger concerns as well as yards performing various government contracts (Navy & USCG). SPAR's systems have features that can be employed to satisfy the more rigorous planning and reporting requirements of these government contracts. Dealing with government agencies can be a daunting exercise, and SPAR and its systems can help streamline the shipyard's responses so that they do not adversely impact the effective operation of its business. SPAR's systems have highly integrated business functions. Easy access to important information at all levels of detail allows the shipyard to be more confident that all areas of their operation and administration are always kept informed and that the information is both timely and consistent across all aspects of its business.

SPAR'S *PERCEPTION*© SYSTEM FOR SHIPYARDS

SPAR's *PERCEPTION*© system is client/server system that is Windows-based. Its backbone is an SQL relational database that links all system functions. Additional system features include direct access to email (reports, bid estimates, purchase orders, customer invoices, etc.) as well as operation of the system over the Internet for remote users.

PERCEPTION fully integrates the following shipyard business functions:

- Cost estimating
- Planning & scheduling, including shipyard manpower planning & forecasting
- Engineering drawing & bills of material management (with interface to CAD systems)
- Project management & earned value cost/schedule performance reporting which are compatible with DoD reporting requirements
- Production work orders & time management (with interface to Payroll system, including off-site services)
- Purchasing (domestic & foreign funds) & material control, including flexible parts catalog and optional functions for kitting new construction work order material requirements
- Vendor invoice management (with interface to Accounts Payable system)
- Customer invoicing, time & material; progress invoicing, fixed price invoicing (with interface to Accounts/Receivable system)
- Small tools management

PERCEPTION does not include the HR and basic accounting functions: payroll, general ledger, accounts payable/receivable, and asset cost management. *PERCEPTION* has interfaced with many different 3rd party accounting and CAD systems. *PERCEPTION* provides convenient and flexible features for enabling a seamless and continuous interface with these 3rd party systems.

PERCEPTION has performed across a wide range of shipyard business opportunities: new construction, ship repair and overhauls, and cost/schedule management of overhead and plant maintenance

activities. Each of these business activities exhibit their own unique operational characteristics which *PERCEPTION*, with its flexibility accommodates easily.

- For new construction, special features support modern shipbuilding methods for modular construction, zone outfit, and piece parts manufacturing as well as time-phased production support activities (for example, technical, testing, quality control and temporary services)
- For the repair business, *PERCEPTION* supports not only pre-planned material requisitioning and procurement, but also a special “quick” purchase and “quick” stock withdraw functions that expedite production without unnecessary steps and transactions (the system, when these “quick” functions are used, generates the added transaction automatically to ensure a full accounting of costs is not sacrificed). Invoicing for repair work may be done real time as long as time charges and material usage transactions are kept current.
- For overhead and plant maintenance activities, *PERCEPTION* allows management to set realistic budgets that can result in lower indirect costs for the shipyard. Repair costs and plant equipment can be easily reported so that more informed equipment replacement decisions can be made.

PERCEPTION has Microsoft Project embedded within it planning and scheduling functions so that direct links to production work orders and purchase orders can be established.

PERCEPTION can be linked directly to Microsoft Office products Outlook, Word and Excel. Information from these products can be easily imported into *PERCEPTION* and easily exported to these products. Features supporting these interfaces include cut/copy/paste, and more comprehensive data mapping.

PERCEPTION offers a very wide range of reporting function capable of generating reports (on-line, tabular and graphical) at many different levels of details and selection criteria determined by the user. The system also has features for downloading report data to 3rd party products including Excel, Crystal and others.

PERCEPTION has special features for interfacing with ShipConstructor, a popular 3rd party CAD system. Interfacing with AutoCAD will depend on the version of AutoCAD and what bills of material/parts catalog is available. *PERCEPTION* has its standard interfacing features for mapping and linking into various databases including ACCESS and more powerful SQL databases such as Microsoft SQL Server, SAP/Sybase SQL Anywhere, and Oracle. Customizing an interface may also be considered.

SPAR's system modules can be operated independently, or integrated for a complete contract management capability. These modules also can be integrated with traditional financial and accounting systems and with advanced computer-aided design (CAD) and engineering (CAE) systems. This integration of software products eliminates duplicating data entry costs and ensures that consistent, current and accurate information is readily available when needed throughout the company organization.

ESTIMATING COST MODELS

SPAR maintains a large library of ship construction costs (labor hours and material \$) as well as ship overhaul and repair (labor hours and material \$). These costs have been compiled into appropriate cost estimating relationships *(CERs) that provide the backbone of SPAR's Design & Construction Cost Models and SPAR's Ship Repair Cost Models. Without a wide range of good cost data, developing any meaningful cost estimating capability is not possible.

SPAR's Design & New Construction Cost Models provide a wide range selection of equipment, systems, materials, machinery, components and shipyard services to be included in a developing cost estimate. Several variants of the new construction cost models focus on different ship types: naval and commercial, mono-hull and multihull. For instances at early stages of design, where some of the details of the ship design are not yet known, the cost models provide default design parameters based on detailed parametric surveys of similar ship designs and characteristics.

SPAR's Ship Repair, Maintenance & Upgrade Cost Models also provide a wide selection of shipyard activity and production rip-out/repair/replace process options that can be specified and selected for an estimate.

SPAR's Life Cycle Cost (LCC) Models work from design information directly available from SPAR's Design & Construction Cost Model: structural definitions of weights and type materials of hull and superstructure; type and size of propulsion machinery; type and size of electrical power generation and distributed systems; electronics & navigation systems; selection and capacities of piping and HVAC systems; coating surface areas and coating specification for various ship areas (bottom, topsides, superstructure and internal spaces); specifications for accommodations areas; deck equipment; and armament; etc.

The LCC model accepts entries of typical planned schedules for maintenance, repair, overhaul and modernization activities over the life time of a ship. Relatively simple inputs of estimated equipment repairs, maintenance overhaul and replacement activities can be readily defined from the design specifications available from the construction model while the ship repair, maintenance and overhaul costs that can be related to that equipment.

GENERAL IMPLEMENTATION

No system should be installed unless it is done so properly. SPAR will ensure that its systems are implemented properly and that users are trained to operate the software correctly and can gain maximum benefits as quickly as possible.

SPAR offers training courses and management seminars both in the use of SPAR's systems and in the fundamentals of company planning, scheduling and cost/schedule control monitoring. These formal courses can be conducted either on-site or at SPAR's office in Annapolis, Maryland. These courses provide a full range of educational topics designed to help the customer establish sound directions for implementing effective program planning and cost and schedule controls.

A comprehensive set of training tutorials, user manuals and other related documents also are provided which users may follow at their pace.

Installation of *PERCEPTION* requires approximately 3 work days for the following:

- Load the software and its database on the shipyard server
- Install the system on individual shipyard PCs (a setup program is provided to automate each set up)
- Set up the shipyard's set of operating business rules (listing provided in the Systems Administration Manual)
- Assign user passwords and functions each will be allowed to access.

Users of SPAR's software typically are grouped by department application: estimating; planning; engineering for bills of material transactions; production work orders and time charge management; accounting for interface transactions; purchasing; stores; production; and IT. Training is then provided by group (usually limited to about 12) so that each can focus on those transactions and features that support their individual job duties within the shipyard organization. Training averages about 2-3 days per group at \$1,160 (current pricing) per day plus travel, accommodations, and per diem expenses billable at cost. Additional "hand holding" is available either on-site or via phone/emails.

During start-up periods, the shipyard may elect to allow SPAR limited Internet access to its SPAR system installation in order to address user questions and issues as they arise. This arrangement allows SPAR to respond quickly and almost immediately to problems and questions.

MAINTENANCE SERVICES:

After a software purchase warranty period, SPAR offers software maintenance services, which includes delivery of software enhancements and improvements as they are made available to SPAR customers.

Maintenance services can be provided according to various arrangements, including quick and easy email updates and installation instructions to the customer.

SPAR provides a hot line service during normal working hours and emergency service after hours.

CUSTOMIZED SOFTWARE DEVELOPMENT:

SPAR is in the business to make certain our software meets every customer's special needs. We will modify our systems; even develop new ones, so that the customer can get exactly what is required to suit specific business requirements. SPAR's advanced software technology allows these changes to be implemented quickly and at a much lower cost.

SPAR has implemented computer technology across the entire spectrum of computer technologies: mainframes, minicomputers and PC-based client/server networks. Today's client/server software products are exciting and ever more powerful, yet economical. SPAR's systems now operate exclusively on industry standard personal computers that will run technical and office automation applications. The software environment is Microsoft's Windows which has become the de facto standard around the world.

SPAR systems have been developed using state-of-the-art object-oriented software development tools (SAP/SYBASE's PowerBuilder) and advanced relational databases (Oracle, Microsoft SQL Server &

SAP/Sybase SQL Anywhere) allowing SPAR software to work better and more conveniently than ever before. SPAR has been developing its systems to operate on a global integration of systems that link company operations (engineering, purchasing, production and financial management) directly with manufacturing vendors and suppliers and with many popular office desktop products.

SPAR's technology has been geared towards the distributed client computing and open systems concepts. These are technical approaches that have been embraced by the computer industry worldwide. SPAR continues to be actively engaged in implementing advanced technologies.

MANAGEMENT CONSULTING & PROJECT MANAGEMENT:

SPAR offers turnkey services for planning, estimating, scheduling and cost/schedule management progress reporting.

As a result of years of experience in the development of management plans and procedures for commercial and government programs and for applications in heavy industry worldwide, SPAR consultants can provide valuable services in scheduling customer projects and assist in developing manpower and material requirements. Once developed, SPAR can maintain the database and issue weekly management reports and project performance analysis.

SPAR consultants have considerable experience helping companies better identify areas where improvements can be realized with better planning and integration of company functions.

SPAR services are designed to simplify the planning process, yet increase the visibility of costs and schedules of a project. With the guidance of SPAR's expert planning staff, an organization can expect to minimize the complexities and uncertainties of structuring projects. Every facet of a project is considered and integrated into an executable plan. From the initial concept to the finished product, the staff provides the necessary information for better project control by unifying all the components of costs and schedules.

INDEPENDENT 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 and 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. SPAR's commercial life cycle cost estimating models develop estimates of required freight rates (RFR) by modeling various options of operating characteristics and trade route scenarios.

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.

