

Coatings: New Players
New Ways of Thinking

Going Deep
Subsea & Hi-Tech Solutions

Marine Propulsion
Getting Greener Easier

November/December 2008

The MARITIME EXECUTIVE

INTERNATIONAL CAPITAL FOR EXECUTIVES



Joseph S. **Compofelice**
Chairman & CEO

TRICO MARINE

The MARITIME EXECUTIVE

INTELLECTUAL CAPITAL FOR EXECUTIVES



Photo courtesy Trico Marine

18 | Case Study:

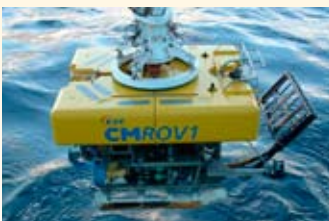
Trico Marine

Trico Marine's Unique Business Model: Well-Grounded and Not Likely to Be Duplicated Any Time Soon
by Joseph Keefe

28 | Executive Interview:

Joseph S. Compofelice

Chairman and CEO, Trico Marine
by Joseph Keefe



14 | Who Says Cleaner Vessels Always Mean Higher Costs?

IMO's New Emission Standards and The American Advantage
by John McCown

38 | Calico Coatings Slick, Fast and Clean

Helping Solve the Engine Problems of the Workboat Industry
by Joseph Keefe

42 | Marine Propulsion Systems

It's All About Choice
by Larry Pearson

48 | Offshore Security of a Different Kind

Equipment Tracking and Cataloguing
by Joseph Keefe

54 | On the Hull, In the Tank & Making Sure

Marine Coatings Step Up to Meet the Maritime Industry's Changing Needs
by MarEx Staff

60 | Passion For Innovation:

Dassault Systemes and the Science of Shipbuilding
by Barry Parker

64 | INMARSAT:

Covering the Global Village
by Tony Munoz

MarEx Departments

Executive Achievement

8 | Richard Bludworth, President & CEO, Bludworth Marine LLC

Naval Architecture, Marine Engineering, and Vessel Repair
by MarEx Staff

Washington Insider

10 | National Election Results Action for Maritime Policy

Change is Coming
by Larry Kiern

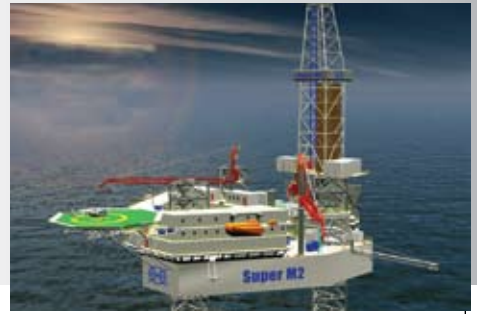
Upgrades and Downgrades

16 | Where Are They Now?

Harvey Gulf and Rigdon Marine Make News - And Waves
by Jack O'Connell

72 | MarEx Crossword

by Myles Mellor



By Barry Parker

PASSION FOR INNOVATION:

Dassault Systèmes and the Science of Shipbuilding

A REVOLUTIONARY NEW WAY OF BUILDING SHIPS AND OFFSHORE platforms is leading to reduced man hours and costs and fewer accidents. With computers and sophisticated software programs taking the place of physical models, design and construction techniques are extending to places never before reached. Dassault Systèmes is a leader in the technology known as Process Lifecycle Management or PLM, which makes it all possible. Read on to learn how innovations first used in the aerospace industry are now being applied to shipbuilding – and with extraordinary results.

Complexity and Transformation

At first glance, sheer complexity is the common denominator of DDG 1000 (a new generation of U.S. Navy destroyer), and the Sevan Hummingbird (the world's first cylinder-shaped FPSO, currently producing oil in the North Sea). In each case, the respective builders, Bath Iron Works in Maine and Yantai Raffles in China, were tasked with delivering vessels never previously built. Thus building these vessels required not only the designs and diagrams familiar to naval architects and builders but also the actual transformation of the yards' standard business processes. Rather than being discrete activities, design and production planning have moved to a common platform, thereby lowering costs and offering significant time savings.

"A common platform certainly lowers costs," says Rob Beadling, the sales manager for Marine & Offshore Industries at Dassault Systèmes (DS), one of the leading solution providers in a category of systems called Product Lifecycle Management (PLM). Paris-based Dassault Systèmes (not to be confused with aerospace leader Dassault Aviation) is a global company whose design and collaboration applications are being used by the yards cited above and many others.

Technology Moving Down-Market

Beadling explained that Dassault Systèmes and its technology gained traction in the early 1980s, working with Boeing while the aerospace giant was designing the "777" jetliner. Beadling, who is based in Yorktown, VA, explains, "This was the first plane to be designed totally digitally – through 3D visualizations. If you can design this way, you eliminate the need for physical mockups. That's an example of a transformation accompanied by an enormous savings and quicker design cycle." He added, "We have developed a maritime business offering similar applications to the larger yards. Now, we have created a pathway for the midsized and smaller yards to enjoy access to the same tools as the world's largest facilities. These yards can become much more efficient and increase their throughput." The title of an article recently written by Beadling and aimed at the broad swath of yards drives the point home, "The Big Boys' Technology Can Now Be Yours."

Dassault Systèmes is itself technology-driven. With 2007 revenues just short of \$2 billion, nearly one quarter of this top-line number is put into research and development at 22 labs around the world. Some 45 percent of its 7,500 employees (spread over 27 countries) work in R&D. In conversations, Rob Beadling shows how DS and its PLM solutions have evolved, outlining the progression from CAD on mainframes, through UNIX workstations and then MS Windows computers, and into the future: "Now we can see the next wave advancing. The Internet and high-speed communications are bringing new capabilities to enable global collaboration and facilitate project management." On the horizon now are realistic 3D simulations and lifelike visualizations where vessel designers and builders (who might be separated across continents), can quickly assess impacts of decisions. They can use virtual reality to walk through a pump room on a tanker, for example,

Product Lifecycle Management ...includes design and analysis tools well-known to naval architects...and the additional dimensions of collaboration, business and process management, and much more.

and instantly see the effects of upgrading to a more versatile pump (with a significant impact on piping) before a change order is issued.

Dassault Systèmes' Offerings to Shipyards

Product Lifecycle Management, the marketplace where Dassault Systèmes claims pole position (with 100,000 customers spread across 11 core markets, including shipbuilders), includes design and analysis tools well-known to naval architects (including drawing and finite element analysis). But these are really the tip of the PLM iceberg, which adds the additional dimensions of collaboration, business and process management, and much more.

Citing the example of the tanker's pump room, the connective nature of the six DS applications, all built around a common architecture, allows for management and checking of interferences. The changed pump may require rerouting of piping which, in turn, may necessitate shifting locations of equipment elsewhere (in a cargo tank, perhaps). As a result, a changed manufacturing workflow for cutting internal tank sections would be needed. The PLM system would automatically revise the relevant plans throughout the design (include those in the tanks) but would also prepare revised cost estimates and workflow specifications to guide the yard's production department.

The starting point for many PLM strategies is DS's CATIA solution – a portfolio of applications for 3D-modeling of vessel arrangements, structures and piping, electrical systems and nearly everything in a new vessel. Because of its applicability for so many ship-design processes (the CATIA software portfolio supports 165 of them), CATIA can be used to handle tasks that otherwise would be done on disparate systems. CATIA integrates with Dassault Systèmes' other applications so that, for example, the piping design can communicate with software driving the actual pipe fabrication and installation.

Designs can be evaluated virtually using SIMULIA, which provides a collaborative platform for finite element analysis (FEA) and other types of simulation – an intermediate step where designs can be tested prior to the production process. The American Bureau of Shipping recently selected Abaqus, an application of the SIMULIA suite, to evaluate how jackup rigs will perform in actual conditions, including harsh weather environments.

With increasingly complex vessels and oil production units, the entire manufacturing process may require modifications. All aspects of the produc-

tion process of a vessel can be engineered with DELMIA, which is widely used in the aerospace and automotive industries. For shipbuilders, process planning and simulations of factory flow, scheduling of component deliveries to the shop floor, planning of workloads, and simulation of robotic tasks can all be accomplished with this part of the PLM suite, contributing to an efficient and lean manufacturing process.

The entire picture is optimized with the ENOVIA portfolio, which enables the tighter collaboration among engineering and production teams that characterizes modern ship development, as well as with external suppliers and outside vendors, using an open Web-based services architecture. DMU (i.e., "digital mockup"), a methodology for handling "interference" issues, also resides in ENOVIA. DMU is the visualization of all parts in a working whole, allowing for clash detection and other broader-scope design review activities. Data from financial systems, ERP, CRM and sourcing applications are all pulled into the product design and production process via ENOVIA.

More Power for the Smaller Yards

Like all advanced technologies, Dassault Systèmes' PLM solutions combine many years of refinements in numerous other industries, leveraging the collective experiences of thousands of users. And after substantially penetrating the market for military construction at the big U.S. yards, DS's PLM software for maritime markets is at a point of inflection as it moves down its own product lifecycle. DS is now in a position to offer its tools to smaller facilities. Beadling told Maritime Executive, "The beauty of Dassault Systèmes' PLM is that it isn't monolithic enterprise software, like ERP. Customers can get their feet wet slowly, implementing a subset of the overall suite. For instance, they can benefit from the pure modeling power of CATIA but choose not to use certain applications within the PLM portfolio. As yards' projects grow in complexity, they can add more collaboration or production planning capabilities to their PLM implementation." He added that designing a superyacht (comparable in size to a small merchant ship) might require "50 percent of what's used by the U.S. Navy."

Superyachts Flying Over the Water

DS has built a significant franchise in the Superyacht arena, according to Francois Mathieu, DS's development leader for the yachting market. When asked about customers, he mentioned well-known yacht builders Beneteau

Forensic experts: **Workboats**

Regulations/Code of Practice
Maritime Security and ISPS Code
Protection of the Environment:
Oil Pollution, HAZMAT
Navigation
Stability
Safe Working Conditions
Towing Operations

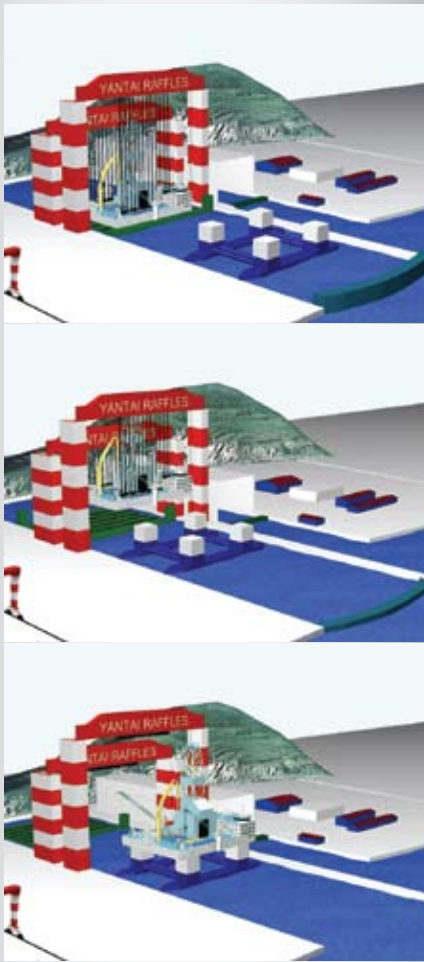
Cargo Handling Operations
Safety and Firefighting
Vessel Repair and Shipyard
Operations
On-board Injuries
Machinery and Electrical
Marine Propulsion

Experienced maritime professionals including:

- Director, Office of Marine Safety, NTSB (ret.)
- Chief Engineers, U.S. Merchant Marine
- Captains, U.S. Merchant Marine
- Professional Marine Engineers and Naval Architects

800.813.6736
robsonforensic.com

Robson Forensic
Engineers, Architects, Scientists & Fire Investigators



(builder of the powerboat "Monte Carlo 37" with a patented aerodynamic "AirStep" hull) and CMN Yachts, as well as Isonaval (collaborating with Viudes Shipyard). DS has now teamed up with German PLM partner CENIT, to offer a new product- "CENIT Naval Architect," which Mathieu says enables integrated boat design in the new package combining CATIA with an object-oriented modeling package known as MAAT.

Mathieu amplified, "A lot of very famous names in naval architecture, like the Argentine Juan Yacht Design or the French Berret-Racoupeau Yacht Design, are using both CATIA and MAAT and will benefit from the integration coming with the 'CENIT Naval Architect' module." He suggested that other existing customers would likely be candidates for the new offering.

Game-Changing Process Redesign for Offshore Equipment Builders

The specialty of the Yantai Raffles yard in Shandong Province, the industrial heartland of northeast China, is the burgeoning offshore sector, where the frontier of ultra deep water drilling has moved to depths of as much as 10,000 feet. Its chairman, Brian Chang, told Maritime Executive that he first became involved in the offshore sector in the late 1960s and has seen the dramatic evolution of technologies from the jackup units prevalent in that era to the latest generation of Floating Production, Storage and Offloading (FPSO) units and semi-submersible drilling rigs. Mr. Chang, who founded the yard in 1994, said that one of the nine rigs on order at the yard will be able to drill to 14,000 feet.

For Yantai Raffles, DS's PLM applications have played an integral role not only in the production of the FPSOs and semis, but also in developing a building process that gives the yard a competitive advantage. In talking about an order of three units for Awilco, an offshore leader, Chang explained: "PLM enabled us to fundamentally change the way that we build the semi-submersibles. We needed a large crane – and we built it – the "Taisun," the largest crane in the world. It is rated at 20,000

Superior Thermal Insulation No Matter The Destination

- **Exceptional Thermal Insulation**
- **Anti-Condensation/Anti-Sweat**
- **Stops radiant heat transfer**
- **Rapid application with minimum labor reduces construction time**
- **Non-combustible**
- **No Corrosion Under Insulation**
- **Surface inspectability at all times**
- **All major marine approvals**



Call today to find out how the Mascoat Products can help to protect your vessel.

800.549.0083
www.mascoat.com

Photo Credit: Ryan M. Moody

Servicing Puerto Rico and the Dominican Republic

2008 US EPA SmartWay Program Award Excellence Winner

Trailer Bridge, Inc.

800.727.3859
www.trailerbridge.com

The savings are dramatic. Brian Chang estimated that the seven million man hours needed to build a large deep sea rig (such as those being delivered to Awilco) without the Taisun have been reduced already to roughly four million man hours, using the new crane.

tons' lifting capacity. We asked ourselves how we could build the best yard; we had the vision, and we have made positive changes in our processes that will let us be the best."

He further described the role of PLM as the enabler of a truly powerful transformation process underway at the yard: "First of all, it helped us design the crane and simulate its construction – the crane itself involves enhancements from a typical gantry." Then he added, "For building offshore equipment, there is an enormous savings in man hours compared to the previous methods. With the Taisun, we can build heavy sections on land, as you would want, and hoist them up. Then we can float out the unit." After describing the process where a completed top section must be lifted over the bottom columns and pontoons, he continued, "The old way, there was a lot of very dangerous work at high levels – crews climbing up on ladders, that sort of thing. Now we can lift entire sections that are built at a lower level. We have a 14,000-ton lift coming up in November; there is a 17,000-ton lift also scheduled within our backlog."

Brian Chang continued, "So now we can reduce our costs dramatically and get our projects completed more rapidly. With PLM, customers we have in Norway, like Sevan Marine and Awilco, can participate collaboratively

when we design their rigs. The industry has a lot to learn from aerospace – that's our model, and there is a long way to go so that everyone benefits from the potential. We are at a point now where we can be far more efficient; we can build massive sections in a controlled way, on land, and then hoist them up."

The Value of PLM

The discussion turned to an actual quantification of the efficiencies at Yantai Raffles. The savings are dramatic. Brian Chang estimated that the seven million man hours needed to build a large deep sea rig (such as those being delivered to Awilco) without the Taisun have been reduced already to roughly four million man hours, using the new crane. He told Maritime Executive, "The industry has room for substantial gains through better collaboration when we build these massive structures. If we could get everyone involved – the subcontractors, the suppliers, the class society, all using PLM, we could probably save an additional two million man hours. In other words, what once took seven million man hours of work could be accomplished with two million man hours of work. That's the value of PLM."

MarEx

CENTA Corporation

TORSIONAL COUPLING INNOVATION

25+ Types of Flexible Couplings. Thru 125,000HP



Trust the Innovator!

Leaders in Carbon Fiber Shafting



Power Transmission
Leading by Innovation



CENTA Corporation
2570 Beverly Drive #128
Aurora, IL 60502-8588
Ph 630.236.3500
Fx 630.236.3565

www.centa.info
info@centacorp.com



NORDIC

SHIP CONSULTANTS INC.

Marine towage and consulting firm established in 1980

- Merchant Mariner Owners with extensive background in ocean-towing world wide.
- Towing services all around the US Coast, South America, the Atlantic and Pacific Oceans, Europe, the Middle East, and Asia.
- NSCI enjoys a long track-record of successful, reliable service.
- We serve all destinations with a deep knowledge base and valuable time saving service infrastructure.
- Worldwide sale & purchase of commercial & offshore vessels of all types and configurations.
- Management services & operational staff with vast insight and long, "hands on" field-experience.

www.nordicship.com | **954 524 0025**