

Applications of Modern Shipbuilding Design

Course Addresses shortage of skilled marine designers

By Raina O. Clark

As a result of a partnership between the shipbuilding industry and higher education, the University of Wisconsin-Marquette and the University of South Alabama will soon be offering the first continuing education shipbuilding course in the U.S. using the industry standard ShipConstructor software.

Currently, the only training of this type in North America is at the Memorial University of Newfoundland in Canada.

Course development was funded by a U.S. Navy National Shipbuilding Research Program (NSRP) grant, whose overall goal was to reduce the cost and cycle time required for second-tier ship design. Specifically, the course was a result of NSRP's Design Tool Enhancement III project.

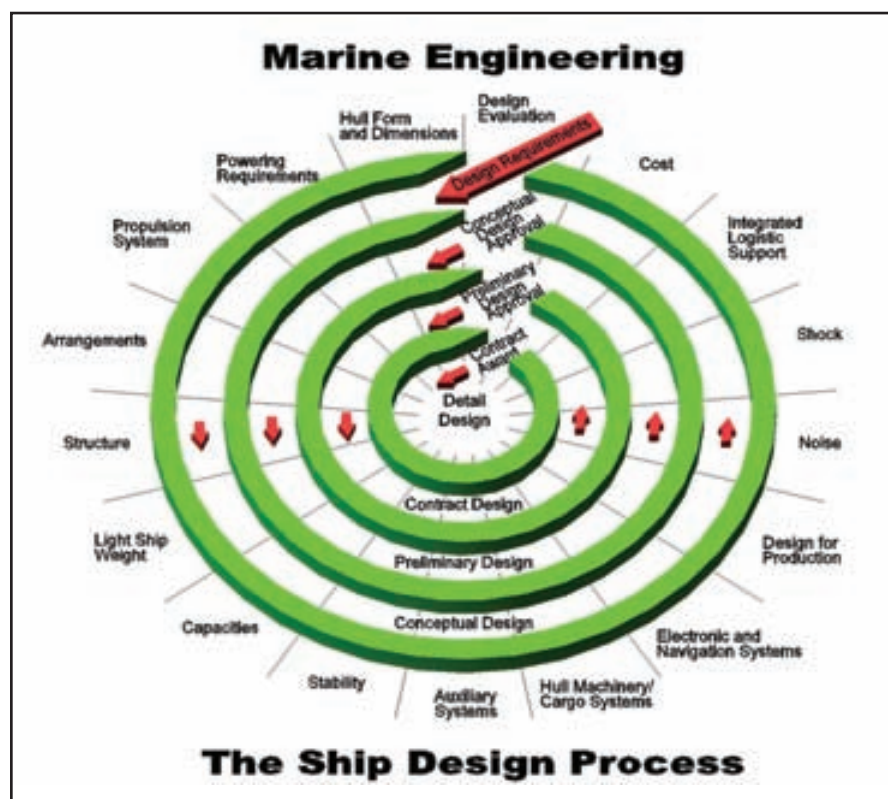
The first objective of the project was to add functionality to the ShipConstructor software platform; a 3D, database-driven, parametric modeling program that runs inside AutoCAD. Second, the project called for the development and implementation of marine design education and software training.

According to industry experts, a shortage of skilled marine designers is at least partially at fault for driving up the cost of new vessels. Fewer designers means higher turn over as personnel are recruited from one firm to another, forcing the price of designers up and, consequently, the price of ships.

\$635,000 of the NSRP Design Tool Enhancement III project funds were dedicated to creating training that would increase the pool of skilled designers. As a result, a team of university instructional specialists, shipyards, ship design firms and software experts has developed Applications of Modern Shipbuilding Design, a new course due to be offered in fall 2008.

Students are expected to begin the course with a basic understanding of AutoCAD, high school math and an interest in shipbuilding. Course graduates will gain the practical skills and knowledge necessary for entry level designers in a shipyard or marine design agency.

"It's exciting to be one of only two universities that will provide this training," said Paula Langteau, University of Wisconsin-Marquette's Campus Executive Officer and Dean.



Applications of Modern Shipbuilding Design

Four units covering 12 competencies:

Unit 1

- Components of the Shipbuilding Industry
- Shipbuilding Terms and Activities
- Shipbuilding Materials and Shapes

Unit 2

- 2D Industry Standard Drawings
- 3D Drafting

Unit 3

- Logical Build Strategy

Unit 4

- Basic Structural Assembly Drawings
- Piping System Drawings
- Basic Electrical System Drawings
- Basic HVAC Assembly Drawings
- Outfitting

This 60 semester hour course has a high expectation for work beyond class time. Students may spend 60 to 120 additional hours working on their own.

In addition to an on-campus course, UW-Marquette will offer distance delivery, making the course accessible from anywhere in the U.S. "It gives us the opportunity to serve not only local needs, but a huge national need as well," said Langteau.

"We have the resources of the entire University of Wisconsin System to help us deliver this course nationally, includ-

ing a fully integrated course delivery platform that can be accessed on-line."

UW-Marquette will be offering the course to groups of students, or cohorts. "We'll see who signs up and base the course schedule on the needs of that particular cohort," she said.

UW-Marquette anticipates working with shipyards and other employers who want to send groups of their employees

to the course. "We don't know what demand is going to look like, but we're going to serve everyone who is interested, including the partners in the project and the general public."

University of South Alabama, located near many shipyards, will offer an on-campus course only. "It's a unique opportunity to collaborate with ShipConstructor, Bender Shipbuilding, and others funded under the NSRP grant," said Patricia Miles of USA's Center for Continuing Education and Conference Services. "With eight shipyards located within a 150-mile radius of Mobile, the University is strategically positioned to help retool the region's labor pool to better serve the shipbuilding industry."

Part of the course development team's job is to ensure that the curriculum is identical in Alabama, Wisconsin and the distance course. The performance expectations are the same, regardless of location or delivery style, meaning shipbuilders can have the same level of confidence in all graduates.

Langteau outlined the course in a December 2007 presentation to the NSRP Joint Panel: Students will learn about marine materials, classification societies, safety issues, shipbuilding terminology, fabrication strategies and shipyard drawing standards. They will practice their skills modeling structural piping, HVAC and equipment parts with the ShipConstructor software tool. They will create realistic production output such as assembly drawings and parts nesting.

Graham Chamberlain, lead on the project for ShipConstructor Software Inc., was also integrally involved in developing the curriculum. "This course will bring junior designers up to a skill level where they're really employable," he said. The course is different than the training ShipConstructor usually provides because it's not just software instruction, but an education in ship design theory.

"The curriculum uses ShipConstructor in the background, like an accounting course might use Microsoft Excel," Chamberlain said.

"The software will showcase what they've learned and they'll walk away with a really good working knowledge of how ships are designed and the shipyard process."

Ron Selvidge of Art Anderson Associates, one of the project team members, heartily agrees there is a shortage of marine designers as well as degreed marine engineers in the field. The difference is that marine designers, the support personnel for engineers, have no educational standard to go by. "They don't require an engineering degree to do their job," Selvidge said, "but there is no other established certification for them. Unlike engineers, that doesn't exist on the designer side."

According to Chamberlain, about a dozen universities around the world teach ShipConstructor software courses as part of a larger marine degree program. However, that represents a four or five year commitment that often graduates marine engineers or naval architects, not marine designers.

The industry is aware of the lack of a national educational standard for junior marine designers. This is why the group involved in the NSRP curriculum project has proposed follow-on advanced courses complimented by a national certification process which shipyards could use as a prerequisite for hiring.

Chamberlain emphasized the importance of marine designers' work. "A junior designer has a huge amount of impact." For example, he said, "people often don't realize that the drawings the designer creates actually cut the steel. The designer's computer sends the information from the drawing to the steel cut-

ting machines."

Those considering a career as a marine designer might get some insight from Michelle Detroot, Senior Designer at Art Anderson Associates. She explained that "the best part of the job is seeing the ship in 3D with all your design in place and essentially walking through a virtu-

al ship. There's always something new to work on and the pay is better than a lot of other fields. There is a high demand for employees and that's been the case since I started in 2004."

Those interested in the Applications of Modern Shipbuilding Design course, either through distance delivery or at

UW-Marquette, should contact Jane Jones, Director of Continuing Education, at jane.jones@uwc.edu or call 715.735.4300. Those interested in the course at the University of South Alabama should contact Patricia Miles at pbmiles@usouthal.edu or 251-431-6411.



Major curriculum project partners:

Universities

- University of South Alabama
- University of Wisconsin-Marquette
- Memorial University of Newfoundland, Canada

Software developers

- ShipConstructor Software Inc.

Shipyards & ship designers

- Art Anderson Associates
- Austal
- Bender Shipbuilding & Repair Co.,
- Bollinger Shipyards, Inc.
- Elliot Bay Design Group
- Genoa Design International Ltd.
- Gibbs & Cox, Inc.
- Manitowoc Marine Group
- Northrop Grumman
- Todd Pacific Shipyards
- VT Halter Marine

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