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OLD DOMINION'S ENTERPRISE CENTERS

*Center for Advanced Ship Repair  
and Maintenance*

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*CASRM works in cooperation with area shipyards, including Newport News Shipbuilding where the barge used for the water-treatment system was constructed. Photo courtesy of Newport News Shipbuilding.*

# Shipyards Clean Up Thanks To Maritime Center

BY JAMES SCHULTZ

Wash behind your ears, keep your fingernails clean and always use soap: These parental admonitions are issued every generation to legions of the unscrubbed young. Just like the littlest humans, large oceangoing vessels need a thorough shower — and, like children, their washing can provoke howls of protest.

Ironically, clean often leads to dirty. When a ship is put into drydock, effluent from cleaning flushes toxic byproducts from antifouling compounds used on hulls directly into coastal waters, threatening sensitive ecosystems and the marine food chain. Pending, stringent regulations aim to put a stop to the practice, but at great expense to shipyards and shipping concerns.

Enter Old Dominion University's Center for Advanced Ship Repair and Maintenance (CASRM), which appears to have found a cost-effective solution. The center has worked with local industry to develop a portable, barge-mounted water-treatment system that will drastically reduce or eliminate altogether the dangers posed by tributyltin, or TBT. Because the compound is such a potent biocide, TBT has been incorporated into antifouling paint used on nearly 75 percent of the vessels in the world's commercial fleets to control or prevent the growth of marine organisms.

CASRM's portable system will shuttle between six different drydocks in the Hampton Roads area. Wash water will be pumped into the barge holding tanks and treated by a series of interconnected water-treatment modules, which will progressively remove solids and dissolved pollutants from the waste stream. The plant will be able to treat water at the rate of 100 gallons per minute for 24 hours of continuous operation. CASRM has been awarded a National Pollution Discharge Elimination System permit to discharge processed water. Barge tanks will be used to store any untreated water.

"What we're doing will have a very big effect on the water in this region," says CASRM Executive Director Thomas Fox. "It's real environmental engineering; it's vital work."



## Up To A New Standard

The new standard will be quite rigorous: 50 parts per trillion of TBT by Dec. 31, 2002. The international body governing marine maintenance and repair has suggested an outright, but voluntary, TBT ban by 2003 and mandatory elimination of the compound by 2008.

Two years ago, one local shipyard, Norshipco, took the initiative to test water treatment options. A proof-of-concept trial demonstrated that TBT levels could be slashed from 185,000 parts per trillion to 250, five times higher than the ultimate 2002 target, but many times less than any system now in existence. The new barge-based prototype is a combined refinement of that design, the adoption of a treatment process known as the dissolved air flotation system and other significant modifications, including sensor monitoring of water influent and effluent and chemical inputs.

Fox says the design of the water treatment system was no radical departure from known technology, but rather one that makes new use of existing techniques and components. Such an approach is at the core of the CASRM's mission: once given a specific task, figure out the best way to accomplish it efficiently and cost effectively.

"We were handed a very specific problem," he points out. "Here's a 50-gallon barrel of water. It's got TBT in it. How do you get the TBT out?"

One of eight Old Dominion Enterprise Centers, CASRM was formed in 1995 as a result of previous discus-

sions between Old Dominion and senior executives of Norfolk-based Norshipco, the largest shipyard in the United States devoted exclusively to ship maintenance and repair. CASRM was initially funded for two years at \$1.5 million, in a joint effort by the university, the city of Norfolk, Virginia's Center for Innovative Technology and a Norshipco-led group of area shipyards. Other public and private monies have since followed; CASRM's current budget, including project outlays, stands at \$2 million.

"Essentially we're a virtual organization. We don't even have a lab," Fox says. "But we have access — to Old Dominion laboratories, to shipyards with big ships and drydocks and to between 20 and 30 regular collaborators. We pull expertise directly out of this region.

"One of my main jobs is to figure out what industry needs and carve out of that university projects

that faculty and students can tackle. We know what the research is going to be used for. All we have to do is do it right."

CASRM's involvement with environmental issues will only intensify, predicts Fox. Within the next decade, in this country and abroad, maritime interests will likely feel heightened pressure from regulatory bodies and the general public to conform to cleaner-water standards.

"All shipyards are competing brutally against one another," he points out. "There's one common challenge: environmental concerns. Facing environmental challenges drive up costs dramatically. We're trying to figure a way to meet these challenges without erecting further regulatory barriers. In short: We're changing the process."

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*Left: Ships coming for maintenance or repair often are so enormous that giant scaffolding must be constructed before work can begin. This propeller, when repaired, will again power the mammoth vessel.*

Photo courtesy of Norshipco.

*Right: Tom Fox is executive director of CASRM.*

Photo courtesy of Newport News Shipbuilding.

