TRAINING & EDUCATION

HANDS-ON LEARNING

BY TODD VORENKAMP

Like the oceans themselves, maritime training is in constant flux. New technological advances and evolving regulatory requirements demand constant adjustment. The schools themselves come in all shapes and sizes – from merchant marine academies, union-supported professional training centers and privately run schools to executive-level institutes and local, single-classroom certification centers. All have one goal in mind: ensuring safety at sea.

For the mariner, though, the keel meets the water during shiphandling simulation and electronic-based bridge simulation. That's where the benefits of experiential learning are fully achieved.

MANNED-MODEL TRAINING

Maryland Pilot Joe Schwartzstein recently returned from manned-model training at the Maritime Pilots Institute (MPI) in Covington, Louisiana. He says the true benefit of the manned-model program is that "It allows you to perform some maneuvers you wouldn't ever be able to practice in real life. You can't ask a ship captain to use a dredging anchor. The training can accurately model those maneuvers in ways a bridge simulator cannot."

Worldwide, five other institutes are known for this type of training: France's Port Revel Grenoble Shiphandling School, Massachusetts Maritime Academy, the UK's Warsash Maritime Academy at Southampton Solent University, Poland's Ilawa Ship Handling Research and Training Center at the Foundation for Safety of Navigation and Environment Protection, and Australia's Port Ash.

In the U.S., Massachusetts Maritime Academy is the only college to have a manned-model training program. Four model ships regularly ply the waters of Great Herring Pond. They simulate a twin-screw product tanker, a 906-foot VLCC and a pair of Navy supply ships. Two remote-control tugs with azimuth stern drives will soon be joining the fleet.

Mass. Maritime has been in the manned-model shiphandling business for over 10 years and offers a five-day course for mariners stepping up to their Chief Mate's/Masters license and harbor pilots complying with their associations' mandated training syllabus. Senior-year cadets in the school's Marine Transportation syllabus get some time "on the water" as well. Captain Michael Burns says that the shiphandling characteristics of the models are "proportionately the same" as the vessels they simulate, and the engines are calibrated to provide realistic thrust to match the model to the actual horsepower of the full-sized vessel. He adds that the 1/25th scale keeps the vessels at a "manageable size." The VLCC model is 37 feet in length.

France's Port Revel features courses that allow mariners to experience the handling characteristics of 20 different vessels by

modifying its 11 manned models. Four radio-controlled tractor tugs assist in docking and undocking maneuvers. Six of the models represent oil tankers or bulk carriers between 38,000 and 400,000 dwt. They are joined by two LNG tankers, two containerships and a modern cruise ship with two azimuthing pods. The models are designed so that even the Master's line of sight is similar to what he or she would experience on the actual vessel.

The ships operate on a man-made lake covering 13 acres and featuring wharfs, solid quays, an offshore platform, a scale-model Panama Canal lock and a mooring buoy. To add "weather" to the scenarios, the lake is equipped with wave, current and wind generators. Arthur De Graauw, Director of Port Revel, says that "Eighty to ninety percent of the center's trainees are pilots." He adds that the consensus among students is that the manned-model experience is much better for shiphandling training than electronic-based bridge simulators.

BRIDGE SIMULATORS

Nonetheless, simulators play an indispensable role in bridge management and navigational training, a lesson learned from the aviation industry, which had long used simulation technology. In fact, storied aviation builder Grumman partnered with Sperry in the building of the first bridge simulator at the U.S. Merchant Marine Academy (USMMA) in Kings Point, New York. The awkwardly-named Computer Aided Operations Research Facility (CAORF) was completed in 1976 at a cost of $12 million and is still operational today. Fully updated, a modern Kongsberg simulator has replaced the room-sized, reel-to-reel, tape-driven original.

Originally built for shiphandling research, CAORF was soon used to train USMMA midshipmen and commercial customers. Captain George Sandberg, former head of the Marine Transportation Department, asked students from the senior-year Bridge Resource Management class to recall one lesson learned from the weekly Friday lectures. Very few could. But when asked to recall lessons learned in CAORF, the memories were vivid and fresh. Sandberg says that studies have shown that retention rates of 80 percent or more are common when students are immersed in experiential learning environments while lecture retention is

Courtesy: MITAGS

less than 20 percent. Experiential learning, he says, is "extremely powerful."

One of the keys to successful simulator training is intense scenario planning on the part of the instructors. Sandberg spent an average of ten hours planning a one-hour bridge simulation. He says that proper instructor preparation and student feedback help reinforce good habits in students. Adds Captain John Hagedorn, current CAORF Instructor at USMMA, "The focus of this training is to build the student's confidence."

The Maritime Institute of Technology & Graduate Studies (MITAGS) near Baltimore, Maryland features two full-mission bridge simulators and two tug simulators. Its sister campus, the Pacific Maritime Institute (PMI) in Seattle, Washington, houses a single bridge simulator and two tug sims. Both PMI and MITAGS uniquely feature the Navigation Skills Assessment Program (NSAP) designed to quantifiably evaluate a mariner's performance in bridge simulation scenarios.

Glen Paine, Executive Director, says the NSAP program is not mandated by a regulatory agency but "is about people realizing that the maximum risk for a vessel is during transit." Several shipping companies are putting their senior officers through the course for rigorous evaluation and, starting later this year, all applicant members of the International Organization of Masters, Mates, and Pilots (MMP) will have to attend and pass the NSAP program. Paine emphasizes that NSAP provides "repeatable training of skill-sets that you cannot practice at sea" and adds that "the data elements can be used to gauge learning and improvement" in individual students.

Newport, Rhode Island's United States Maritime Resource Center (USMRC) traces its roots back to the original CAORF operation at USMMC. The Marine Simulation Institute branch of USMRC regularly conducts bridge resource management classes for mariners as well as research. President Brian Holden says, "We are subject-matter experts and globally recognized as specialists in employing simulation technologies in a manner that yields value-added outcomes for clients who bring complex operational problem-sets to us."

Using a full-mission bridge simulator with proprietary in-house software and third-party modeling tools, the Institute is able to create customized simulation functions and data output for a variety of research needs. In a recent marine terminal development project involving maneuvering in a very confined waterway, USMRC was able to provide, through modeling and simulation, a recommended solution involving placement and operation of ultra-high visibility, parallel sector range-light technology to clearly mark channel boundaries.

The Dania Beach STAR (Simulation, Training, Assessment and Research) Center features two full-mission bridge simulators as well as two engine room simulators for its American Maritime Officers (AMO) union membership. STAR Center was the first ISO 9000 certified training center in the U.S. and has a robust instructor training program. STAR Center can link its simulators together

to place more than one "manned" vessel in a scenario if needed.

When it comes to accuracy, Graeme Holman, Head of Operations, likes to tell the following story: "While training the first crew of a new ship prior to its launch, the master noted a very strange sway in DP mode prior to coming alongside the dock. Initially, it was thought to be what is known in the aviation world as a 'sim-ism.' When the ship docked in Miami on completion of her maiden voyage, our team went onboard. In speaking with the captain, he couldn't believe that the very same thing happened when he brought the vessel alongside. It's a testament to the fidelity of our Kongsberg simulation hydrodynamics."

ECDIS, Ltd. of the U.K. specializes in simulation training as well as the building of bridge simulators. Not only does the company install simulators, but it can add customized vessel and harbor designs to existing simulators. When it comes to simulator training, Lead Instructor Nick Harding says, "The simulator is one the most useful training tools we have. It provides the closest environment to 'real life,' and no one is exposed to danger."

A "TWO-WAY STREET"

Learning, in the best environments, is a two-way street, and Harding sees the simulator as a perfect venue for his staff to learn from the students. He says the simulator has "the ability to capture new knowledge and to transfer it forward to others in the maritime industry. ECDIS Ltd.'s instructors find that it is not just the students who undergo training but the instructors as well as they continuously learn new approaches and techniques. Practice makes perfect."

While not the only maritime high school to have a full-mission bridge simulator, the New York Harbor School (NYHS) on Governor's Island in New York Harbor has a new training system donated by Transas and installed by the students. NYHS student Joseph Roberto says, "Everything was pretty much built by the students, the seniors especially, with the exception of the software installation. It went from an idea to a bold process and finally completion in such a quick period of time that my sophomore self would have never thought it possible. The simulator has so much ability and potential that it has become an integral part of the vessel operations program and the school in general." ***Mar**Ex*

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