Developing The Workforce: Next-Generation Ships Will Be Built By Next-Generation Workers

A shipbuilder holds a rope to help guide John C. Stennis' (CVN 74) port side anchor to the ground for repairs at Huntington Ingalls Newport News Shipbuilding. *HUNTINGTON INGALLS INDUSTRIES / Ashley Cowan*

U.S. shipyards are busy building the next generation of Navy ships and Coast Guard cutters. As the current workforce is retiring, and taking their skills and knowledge with them, the next generation of naval architects, naval engineers, tradesmen and technicians are needed.

The Navy is building guided missile destroyers, amphibious ships, attack submarines, littoral combat ships, and replenishment oilers and embarking on a new guided missile frigate, large surface combatant and ballistic missile submarine programs, not to mention a number of new, smaller ships. The Coast Guard is introducing the national security cutter and fast response cutter and starting the offshore patrol cutter, polar security cutter and waterway commerce cutter programs.

Formal apprenticeship and internship programs are delivering long-lasting results. Many graduates of these programs stay with their organizations for a full career and rise to leadership positions.

The Apprentice School, located at Huntington Ingalls Newport News Shipbuilding in Newport News, Virginia, was founded in 1919 and has delivered more than 10,000 graduates since its founding.

“We’re considered as the leadership factory of the company,” said Latitia McCane, The school’s director of education. The program is in high demand. “We have 4,000 applications for 200 slots,” McCane said.

The company has a pre-apprentice program that gives high school students an early start with a job at the shipyard and preparatory courses to get them ready for school. The Apprentice School and its leadership are structured within Newport News Shipbuilding, a division of Huntington Ingalls Industries.

The school’s facilities range from traditional classrooms to waterfront production facilities.

“We have more than 70 craft instructors who are apprentice graduates,” McCane said.

Retired Rear Adm. Brad Williamson, executive director of the Hampton Roads Maritime Industrial Base Ecosystem (MIBE), said senior-level workers are retiring faster than new ones can be hired.

“The senior workers have a wealth of practical experience that they are taking with them into retirement,” he said, adding that shipyards and other marine industry employers are all looking for talent. “When it comes to these challenges, we’re not alone in shipbuilding. It’s all of the trades, in every industry.”

Williamson called for cooperation instead of competition to help everyone obtain the workforce they need.

“It’s better to come together and to think as a team instead of individual companies,” he said.

Craig Savage, director of communications and external affairs at Mobile, Alabama-based Austal USA, said the workforce development programs benefit everyone.

“Apprenticeship programs not only benefit our industry, but they also provide opportunities for our local communities to learn a valuable trade and apply that skill to either our industry of defense and maritime manufacturing, or other industries in our region,” he said. “These programs are a win-win all the way around.”

Austal currently builds the all-aluminum Independence-class variant of the littoral combat ship and expeditionary fast transport for the Navy. As those programs wind down, the company is transitioning to a capability to build steel ships for the Navy.

AIDT Maritime Training Center, a subsidiary of Alabama Industrial Development Training (AIDT), provides company-specific job training in welding, pipefitting, design, structural fitter, safety and leadership to support Alabama’s shipbuilding industry. The center is co-located with the Austal USA shipyard and trains workers to Austal’s methods, tools and standards, and will be vital to training the existing and new workers on steel ship fabrication.

Nuclear Quality Division’s (Code 2350) Nuclear Quality Support Specialist Catherine Hobb observes her brother Rigging and Equipment Operation’s (Code 740) Apprentice Noah Coburn as he rigs up equipment. *HUNTINGTON INGALLS INDUSTRIES / Shelby West*

Starting Young

Fincantieri Marinette Marine (FMM) in Wisconsin is building the Freedom-class variant of LCS and multi-mission surface combatant for Saudi Arabia. It has also been selected to build the Navy’s new Constellation-class guided missile frigate, which requires reconfiguring the yard and upgrading facilities to build the larger ships – and hiring more workers.

“We’re working very closely with community partners to help us to find the majority of those positions locally,” said Bethany Skorik, senior manager of public affairs and government

relations with FMM. “We’re working with our local school systems, from elementary to middle to high school, on how we can get students interested in shipbuilding. They can start thinking about the really satisfying careers in manufacturing and being able to make something complex like a ship from start to finish.”

Skorik said the shipyard is the largest employer in the region, but occasionally has to remind people the yard is growing and hiring.

“We’re working closely with the area technical colleges. The students come to learn about what we’re doing, tour the shipyard and talk to our employees. We help the schools build curriculum, so that students have a direct path to a job. They can get a two-year degree and an actual job, and we have programs where students can start working towards a tech degree while they’re in high school. And we can hire them right out of high school.”

Skorik said FMM partners with the Northeast Wisconsin Technical College, which built an impressive facility a block away from the shipyard.

“They have welding booths and a ship mock-up to teach electrical work, for example. They not only train people who can come work for us, but we send our employees there to get specific marine electrical training, conduct research or expand their knowledge,” she said.

While some shipyards have grown, a number have also downsized or failed, leaving skilled workers without jobs. In those communities where naval ship construction and repair work has dwindled, public-private partnerships have strived to keep good paying maritime jobs in their regions. When the Philadelphia Naval Shipyard and commercial shipyards building ships for the Navy closed, a consortium of educators, the Collegiate Consortium for Workforce and Economic Development

(CCWED), came together to help displaced civilian workers retrain, retool and find other jobs.

Karen Kozachyn, vice president of workforce and economic development at Delaware County Community College in Media, Pennsylvania, and a member of the Business Development Team for CCWED, said the local community colleges have worked together to provide skilled employees.

“If a company asks for training in advanced welding, the consortium team evaluates the need, develops a training plan, locates a training site and then assigns the training to whoever has the capacity,” Kozachyn said. “The curriculum and competencies of the training are established by the employer, so it aligns to the company’s need – it’s never hit or miss.”

Those opportunities exist along a broad spectrum. The Maritime Administration recognizes this and is supporting 27 community colleges, training academies and organizations as Centers of Excellence.

“We are no longer focused only on mariners who go to sea on big ships, but coastal and inland mariners, as well as the shore jobs and trades related to the maritime industry,” said Shashi Kumar, MARAD national coordinator for maritime education and training.

“These smaller institutions, many of which are near ports or waterways, understand the local need. They’re more agile, and can create new programs and accomplish things faster,” he said.

Submarine construction is growing at the General Dynamics Electric Boat submarine construction yards at Quonset, Rhode Island, and Groton, Connecticut, as are new state-of-the art facilities to fabricate and assemble them. Electric Boat expects to hire 2,400 engineers, tradesmen and support personnel this year alone, but finding enough trained and qualified workers continues to be elusive.

The Southeastern New England Defense Industry Alliance (SENEDIA) is a next-generation industry partnership supported by workforce development stakeholders. SENEDIA membership include 130 companies, mostly in southeastern new England, but beyond as well supporting submarine construction and undersea technology. It has an $18.6 million DoD contract to develop the Next Generation Submarine Shipbuilding Supply Chain Partnership in Connecticut, Massachusetts and Rhode Island. The partnership is comprised of state workforce agencies, academic institutions, training providers, and Manufacturing Extension Partnerships and Procurement Technical Assistance Centers in the region.

According to SENEDIA Executive Director Molly Magee, the partner organizations are teaching basic trade skills to make new shipyard workers immediately productive.

“One of our key goals at SENEDIA is to help engage the next generation workforce so that they see and consider the many high-wage, high-demand, high-growth opportunities, whether STEM or trade/industrial skill related, there are through defense-related career pathways,” Magee said.

Complex Skillsets

Building complex warships can take place far from the waterfront, for equipment such as sensors, propulsion plants and integrated combat systems.

James Birge, president of Massachusetts College of Liberal Arts (MCLA), located in North Adams, sees a mutually beneficial relationship between his school and the largest engineering and manufacturing employer in the region, General Dynamics Mission Systems in Pittsfield.

“The company’s business of developing and building complex combat management systems is growing, and there is a need for electrical engineering skill sets – that’s just one discipline – that we could be responsive to. And we want to offer good

jobs to our graduates."

Birge said MCLA is looking at its course offerings as "future-based," in that "some of the jobs our students will have don't exist today."

Ellen Kennedy, president of Berkshire Community College, said her school works with employers and industry sectors in her service area in western Massachusetts to develop a stable and prepared workforce.

"We and MCLA meet with General Dynamics on a regular basis to make sure that our programming aligns with their needs," she said.

Students from both MCLA and Berkshire, along with other schools, can have internships at General Dynamics.

"Interns are an incredible pipeline to our future workforce," said Brenda Burdick, director of marketing and public relations for General Dynamics Mission Systems. "We typically see a 65-75% conversion rate from interns to full-time employee."

General Dynamics Mission Systems invests in its employees and their education and professional development. Employees can be assigned mentors and allow them to participate in rotational assignments that allow them to explore their areas of interest and learn about each facet of the company. It also funds graduate education to develop leaders, business managers and executives, and technical experts.

Lauryn-Mae Pang started her career at Pearl Harbor Naval Shipyard and Intermediate Maintenance Facility in the apprenticeship program and working as a diesel mechanic in the crane shop. Ten years later she's a nuclear mechanical engineer at PHNSY-IMF. *U.S. NAVY*

Government Yards

Like industry, the four government-owned yards have had a large workload coming into shipyard and have been hiring a lot of people. According to John Snell, director for Training and Workforce Development Program Manager for the naval shipyards at Naval Sea Systems Command, there has been a seismic shift in demographics at the yards.

“We used to train our young mechanics said under a few experienced master mechanics, but those senior people have or are now retiring. As these young people have been coming aboard, we’ve needed to get them up to speed quickly.”

Snell said in the not too distant past the Navy was delivering the training in brick-and-mortar schoolhouses, with PowerPoint presentations and a little bit on hands-on training with displays in the back of the classrooms.

“We realized that this was not the path we needed to take to get us into the future,” he said.

That’s why the Navy is updating its training systems to provide more relevant learning that is appropriate for today’s workforce.

“We believe a mechanic needs to touch things – turn a valve, turn a wrench, strike an arc. It’s not the kind of training people can do remotely from home. Most of the online, on-demand training is leadership and supervisory training,” Snell said. “But we are always looking for new simulation capabilities and online tools that can improve and accelerate learning.”

While someone can get a good direct-hire job at one of the naval shipyards, he said the yards’ apprentice programs are a pathway to rewarding, life-long careers.

“The apprenticeship program teaches a lot of things about shipbuilding and repair besides the more-narrow technical skills for a particular trade, and it provides the associate’s

degree from one of our community college partners," he said.

The Pearl Harbor Naval Shipyard and Intermediate Maintenance Facility (PHNSY & IMF) Apprenticeship Training Program is certified by the U.S. Department of Labor and administered through a contract between Honolulu Community College and PHNSY & IMF. The program offers 7,200 hours or more of on-the-job training, trade theory and academic study, culminating in an applied science degree in applied trades and a journeyman job in the shipyard.

Classes are taught in a Honolulu Community College facility on the yard. Jobs are available in structural, mechanical, electrical/electronic engineering, piping, air conditioning and refrigeration and other trades. Qualified and motivated apprentice program graduates can pursue a four-year degree through the Apprentice to Engineer program.

Lauryn-Mae Pang was working several jobs when she found out about the PHNSY & IMF apprentice program. She wanted more than assorted jobs: She wanted a career. She applied, was accepted and completed the apprentice program, becoming a diesel mechanic in the shipyard's crane shop. Pang took advantage of the Apprentice to Engineer program and went on to receive a Bachelor of Science from the University of Hawaii. She is now serving as a nuclear mechanical engineer at the shipyard.

"Some of the people coming into the apprenticeship programs are looking for structure. We give them an educational program with academic standards and teach them a trade with performance standards they have to adhere to," Snell said. "They grow in that environment. And the next thing you know, they're leaders in the shipyard."