



THE NUCLEAR NEWS INTERVIEW

Bob Holland: Introducing young people to the nuclear industry

Bob Holland, a career nuclear Navy man, joined the Shaw Group's nuclear division in 2006 to lead an effort to recruit young people to the commercial side of the nuclear power industry. As manager of training and development, Holland is in charge of the company's new scholarship/internship program, which is run in conjunction with the University of Massachusetts at Lowell (UMass Lowell). In 2007, the program's first year, seven engineering students were awarded with tuition scholarships to attend UMass Lowell during the school year, and with paid internships to work at Shaw during the summer months. The program seeks to introduce these students to the nuclear industry, the hope being that they will eventually choose nuclear as a career. Shaw is now in discussions with other Massachusetts universities to establish similar scholarship programs. In addition, Holland suggests, scholarship programs could be set up by other companies in the industry to draw young people as prospective employees.

Holland retired from the nuclear Navy in September 2006 after a career as a nuclear submariner. During his 30

The Shaw Group's Nuclear Division and the University of Massachusetts at Lowell are working together to introduce engineering students to careers in nuclear power.



Holland: "I can't see why other companies wouldn't want to do it."

years in the Navy, which included an interview with Adm. Hyman Rickover to gain acceptance into the nuclear program, he was an engineer, a junior officer, an executive officer on a Trident submarine after the Cold War, and a commanding officer of a fast-attack submarine during U.S. military operations involving Bosnia-Herzegovina. He also served as commodore of a submarine squadron, in charge of 10 submarines.

Holland calls submarining a young man's game because of the length of time a vessel stays at sea, sometimes for as long as six months. After more

than 20 years in the Navy, most of them aboard a submarine, he landed behind a desk on dry land as the head assignment officer for the submarine community, responsible for assigning enlisted personnel and officers to the Navy's 110 active submarines. Soon after, he was put in charge of assignments for almost 400 000 Navy personnel.

His twilight tour with the Navy, from 2003 until his retirement, was as professor of naval science, teaching courses at Harvard University, the Massachusetts Institute of Technology, Tufts University, Boston University, Boston College, and Northeastern University. During this time, he mentored about 220 students per year who were enrolled in the Naval Reserve Officers Training Corps, leading to their commissioning in the Navy or the Marine Corps.

When he retired from the Navy, Holland wasn't ready to sit on the shore with a fishing pole in hand, so he joined Shaw last year, still having the desire to work with young people and introduce them to nuclear power. Shaw

is a pioneer in design, engineering, maintenance, construction, startup and test, and new plant services. Shaw and Westinghouse Electric Company, its AP1000 Consortium partner, were recently selected to build the first four nuclear power plants in China's nuclear expansion program.

In this interview, Holland talks about the Navy's influence on the commercial side of the business and about the scholarship/internship program he now leads for Shaw. Shaw's program, by the way, was the subject of a presentation that Holland made at the American Nuclear Society's Annual Meeting in Boston in June. The interview was conducted by Rick Michal, *NN* senior editor.

Why is the Navy such a good training ground for nuclear novices?

The Navy's nuclear program is good at bringing undergraduate students up to speed on operating nuclear reactors. A student doesn't have to be pursuing an engineering degree. As long as the student has a solid background in math and calculus-based physics, the Navy can work with him or her. During the program, the students start with the classroom phase of nuclear power school, which lasts for six months. From there, it's on to six months of working on a prototype nuclear reactor. The Navy has two submarines moored at Charleston, S.C., that the students train on. The students actually operate the reactor, stand watch on the secondary side, and learn about turbine generators, motor generators, and electrical distribution. By the end of the program, the students know how everything works in a plant. The Navy also has some land-based reactors that are used in training. The bottom line is that the Navy trains people the way they're supposed to be trained.

Why isn't the Navy's nuclear program as popular as it once was?

It's still a popular and vital career path. However, the Navy doesn't have as many nuclear-powered ships as it once did. The Navy used to have all kinds of surface ships that were nuclear powered, but only the aircraft carriers are now. And for the submarine force, there used to be about 120 nuclear-powered subs, but now there are maybe 55 fast-attacks and 12 Tridents. So there are fewer personnel trained each year. The result is that the number of people that eventually move on from the Navy to the commercial side of the business has gone down. The challenge for the nuclear power industry is to figure out how to "grow their own," so to speak.

How did the training program develop at Shaw?



The seven students from the University of Massachusetts at Lowell who are participating in the scholar/intern program sponsored by the Shaw Group's nuclear division are (from left) Sovanda Mouy, James Parker, Ashley Dumais, Daria Keo, Nicole Sambursky, Michael Champagne, and Michael Dunlevy.

Shaw hired me to establish a training program, to help "grow our own." When Shaw acquired the assets of Stone & Webster in 2000, the company gained a lot of longtime employees. These employees had a lot of corporate tribal knowledge that needed to be passed on to the younger generation. I was hired, based on my experience in personnel management and working with young people, to start developing our workforce for the renaissance of the nuclear power industry. Considering that it takes 10 to 15 years from initial planning to commercial operation of a new nuclear plant, we'd better be getting these young people in the door right now. If we wait too long it will be too late, as much of the

"tribal knowledge holders" will have moved on. So, our challenge was to transfer knowledge from the older employees to the younger ones. A large part of our training program involves our veteran employees' conducting training sessions for the young people, so that they can learn from the veterans who built the plants back in the 1970s. In fact, we call that our mentoring program.

Is the mentoring program different from the scholar/intern program?

Yes, the two programs are separate but related. The mentor program really has two subsets, informal and formal. Informally, corporate leaders such as Bill Griffith, our

vice president for operations, and Dave Barry, president of Shaw's nuclear division, meet over lunch with our new employees and student interns to discuss their own career paths and experiences. The formal mentoring program, on the other hand,

Are the scholarship winners all nuclear engineering majors?

No, on the contrary, only one of the seven students in the program is studying nuclear engineering. We are hoping that because of their internship experience, some of the oth-

ers will opt to pursue nuclear engineering technical electives as part of their majors.

How did the students qualify for the program?

At UMass Lowell, the engineering

dean's office coordinator, Bette Fortin, advertised it to the engineering classes. At the start of the year, the students filled out standard scholarship request forms. They provided their resumes and had to show that their grade point average was at least 3.0. They also had to be engineering majors. For the first year of the program, there were about 30 applicants. From there it was reduced to 20 prospects. I did a phone interview with a number of them, but some weeded themselves out because they weren't really interested in doing the internship, they just wanted the scholarship money. A selection process ultimately picked the top students. Once they are in the program, we look at their grade point averages every semester. We give them a warning letter if their grades aren't up to standards. If they turn their grades around, they are kept on scholarship. Those who cannot may have the scholarship suspended, but we still retain the ability

to keep them on as interns as an incentive while they work on improving their classroom performance.

For all students in the program, we offer winter semester break and summer internships. At the end of each internship opportunity, they fill out a feedback form to let us know what we can

do to improve the program. At the same time, their immediate supervisor on the job provides comments on whether or not to continue to invite the student back to the program. So far, we've found that every one of the students is a fired-up individual. It's been a very positive experience for all of us.

What is the breakdown by class year of the students?

Of the seven, there is one senior, one junior, and the other five are freshmen. Be-

sides the other requirements, the senior was selected because we are hoping that he will come to work for us upon graduation, so it would be a quick return for our work in setting up the program. The junior was selected because it looks like he is going to opt to take the nuclear engineering electives as part of his mechanical engineering program. And then, the freshmen—three of whom are women, by the way—at this point are still investigating which path to take. But that's okay, because if they become civil engineers, chemical engineers, or mechanical engineers, they're going to be needed for building new power plants. Our thought was to involve them early in their university experience.

What are your expectations for hiring these students once they graduate?

We entered into this program realizing that not all seven or eight students per year are going to come work for us. We would like to hire a majority of them, but the real goal is to raise the overall profile of power generation careers for the mechanical, electrical, civil, and chemical engineers who are not familiar enough with our industry because the industry has not been at colleges supporting or recruiting them.

What do the interns experience while on the job?

We worked with Florida Power & Light, which runs the Seabrook pressurized water reactor in New Hampshire, to allow the interns to spend a day at the plant. Going forward, they'll be visiting Pilgrim, a boiling water reactor in Massachusetts. We've also

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hooks up our veterans with the young people, who are already employed by Shaw, in one-on-one long-term career counseling and advisory roles.

Meanwhile, the scholar/intern program is for college students who we want to bring into the nuclear industry. The participants gain financial support for classroom education, and also gain invaluable funded hands-on experience, working alongside skilled professionals in the nuclear field.

How did the scholar/intern program develop?

Michael O'Connell, a Shaw employee, set it up with Prof. Gilbert Brown, of the nuclear engineering program at UMass Lowell. The two of them were talking at an American Nuclear Society local section meeting about how important it was to get a nuclear engineering person on the departmental advisory board at the university because of the input the board provides to the curriculum and accreditation effort. Michael brought a real-world perspective to the campus meetings to show that the demand signal was growing for nuclear education. One of the challenges discussed by the board was how to get more people into the nuclear pipeline. Shaw decided it would be a good idea to provide scholarships as a way to introduce students to possible careers in the nuclear industry. Shaw offered \$20 000 to establish the scholar/intern program at UMass Lowell. That's when I came on board with the company, so I took on heading the effort to set up the program. It turned out that the state of Massachusetts would match our funds, and so combined, there was \$40 000 available for the program. As part of the program, we also set up summer internships at Shaw for the students. These are paid internships, at very competitive wages, so the students are making decent money for their efforts. We are very flexible, too. We realize that a lot of them want to go on family vacations or be with friends during the summer. They told us when they wanted to work and we were flexible with them on it.

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started a mentoring program for them to work side by side with our employees at Shaw. Students are currently working on domestic AP1000 construction preparations, China AP1000 support efforts, and various site-specific jobs, such as for the Millstone nuclear plant. At our offices in Stoughton, Mass., we have a group of 25 young employees who are going through training now. We incorporated the interns into that group, so the interns have a peer group. Some of the young employees have

worked elsewhere, so they have a lot of good experience that they can relate to the young interns.

In addition, we funded every one of the interns to go to ANS's national meeting in Boston this year. They were able to get more involved with the younger folks in the industry and see the spectrum of what is going on in nuclear power, not just what we do at Shaw.

Will your program be funded each year?

Yes. We have dedicated ourselves to it, and we'll eventually expand it at UMass Lowell and enter into new partnerships with other schools. We're working with Gil Brown and his colleague, Prof. John White, to develop nuclear courses that may be given to our employees or exported to other Massachusetts state colleges. Regarding internships, we've entered into informal

agreements with Northeastern University students who would intern with us for six months and then go back to school for six months. We just brought in our first intern from the Massachusetts Maritime Academy, a state school that provides a lot of employees for the two operating plants in the area—Seabrook and Pilgrim.

We've also entered into initial talks with Tufts University, where full tuition for one student is about \$35 000 per year. Instead of paying for all of that, we're talking about funding a single student's design project, which could be done at a

cost of a few thousand dollars. We would then have that student come down to be

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mentored by our engineers in Stoughton. In addition, we've gotten our first intern from the Wentworth Institute of Technology in Massachusetts. We're trying to develop partnerships with all the different campuses around the area, even if it's to provide only a one-summer internship program.

Do you see the program funding only eight students at one time, or would a new set of eight get funding each year, so that after four years the program would be funding 32 students?

While we currently fund just eight per year at UMass Lowell, we are looking to add some additional billets there. But we are also attempting to spread the wealth among diverse campuses in other areas. Examples include Drexel, out of Philadelphia, for our office in Cherry Hill, N.J., and the University of North Carolina at Charlotte and North Carolina State University for our office in Charlotte, N.C. In addition, students and faculty from various universities across the country contact us about internship opportunities. Students who attend far-flung campuses but happen to live near our corporate offices when school is not in session are sometimes available for a cooperative work experience while residing at home. We diligently work to try to match up qualified students with worthwhile job experiences in these cases as well.

Can other companies adopt this program?

Yes, it is easily transportable. We encourage other companies to get engaged at the college level—by participating in freshman engineering lectures, for example—to inform students about power and, more specifically, the nuclear industry, before they start thinking about majors and possible careers. We're more than willing to help any company that wants to do something like this. There's a lot to be gained from it. For example, we've found that the enthusiasm of our senior employees has improved by having the young workers in the office building, adding a bit of energy to the whole unit. I can't see why other companies wouldn't want to do it. **■**



WESTINGHOUSE WOMEN IN NUCLEAR (WIN) awarded a \$1000 scholarship to Melanie Worek, a freshman at Case Western Reserve University, to help her pursue a career in engineering. The scholarship was the first of its kind given out by the Westinghouse chapter of WIN. Worek, pictured above in June with Westinghouse President and Chief Executive Officer Steve Tritch, said she intends to study mechanical or chemical engineering. Worek, of Apollo, Pa., was selected for the award based on her answers to two essay questions and a review of academic achievements, extracurricular activities, and letters of recommendation. Westinghouse WIN is an association of Westinghouse Electric Company employees that provides a network through which women in nuclear energy and nuclear technologies can further their professional development. The awarding of the scholarship supports the association's mission to educate the public on the benefits of nuclear and encourage young people to explore careers in engineering and science. (Photo: Westinghouse)