

Excelsior College: Filling the nuclear industry's employment pipeline

A distance-learning institution based in Albany, N.Y., has become a center for nuclear education. Excelsior College is one of

Excelsior College, a distance-learning institution, is one of only two U.S. schools to offer an accredited B.S. degree in Nuclear Engineering Technology.

only two schools in the United States that has an ABET-accredited Bachelor of Science degree program in Nuclear Engineering Technology. (The University of North Texas is the other.) Excelsior is also the only distance-learning institution to have a student section of the American Nuclear Society, and in July, it will be the first distance-learning school to receive a charter for a chapter of ANS's Alpha Nu Sigma honor society.

Excelsior's four-year Nuclear Engineering Technology program has grown from 55 students in 2000 to about 650 students today. The program's goal is to develop employees for the nuclear industry who can work in areas such as reactor operations, health physics, quality assurance, chemistry, and instrumentation and controls. Since the program was accredited by ABET in 1997, 216 students have graduated from Excelsior with B.S. degrees in Nuclear Engineering Technology.

Excelsior was founded in 1971 by the New York State Board of Regents and is today the most experienced exclusively distance-learning college in the United States.

Known previously as Regents College, it received a charter as an independent, private, nonprofit college in 1998 and changed its name to Excelsior College in 2001. It has been accredited continuously since 1977 by the Commission on Higher Education of the Middle States Association of Colleges and Schools.

Excelsior offers associate's, bachelor's, and master's degrees through its four schools—Business and Technology, Health Sciences, Liberal Arts, and Nursing—and has a current enrollment of about 32 000 adult learners. More than 130 000 individuals around the world have earned degrees from the college.

Three college officials—Jane LeClair, head of the Nuclear Engineering Technology program; Bill Stewart, assistant vice president for Institutional Advancement; and Mary Insogna, senior academic advisor/outreach for Excelsior's School of Business and Technology—talked with Rick Michal, *NN* senior editor, about the nuclear program and its distance-learning aspect and remarkable growth.

The college's Web site is at <www.excelsior.edu>.

How has Excelsior's Nuclear Engineering Technology program been able to develop so quickly over a short period of time?

LeClair: Several factors have influenced this development. Our program became ABET-accredited in 1997, and at the turn of the millennium the industry itself began a renaissance of sorts. Around 2003, our faculty initiated a process of evaluating industry training programs for college-level equivalency, and we embarked on a more

active effort of outreach to communicate with nuclear facilities across the country. Plus, we have seen a greater interest in earning degrees among graduates of the U.S. Naval Nuclear Power School. All combined, these have contributed to the growth in our program.

Is the whole program taught through distance learning, meaning that there are no students sitting in classrooms at Excelsior?

LeClair: That's right. All of our students are enrolled as distance learners. They could be located in the same city or state, or anywhere in the United States or the world. All they would need is the ability to hook up to us by computer. Our format works well for our students. They are able to juggle the online format with their schedules and their lives. We get a lot of positive feedback about our program.

Continued

Who is your typical student in the program?

Stewart: Right now, our students are typically in their early 30s. They are likely to be in the nuclear Navy or already working in the nuclear industry and are seeking a college degree to get ahead in the workplace.

LeClair: Demographically, of the roughly 650 students enrolled in the program, about 92 percent of them are male and about 18 percent are minority students. The program also has a very large active-duty and military reserve component—about 67 percent of the total. And we have people from about 30 nuclear plants who are enrolled in the program.

What percentage of your program's students come to Excelsior having some experience in the nuclear field?

LeClair: At this point, literally all of them. We view our adult students as our main population, but as the industry is changing, our target population may also change to include younger, less-experienced students who definitely would have to take more courses than does our typical adult student. For a student starting from scratch, ours is a four-year, 124-credit program.



LeClair

How does a graduate from Excelsior's program differ from someone receiving a nuclear engineering degree from another university?

LeClair: The focus of our nuclear engineering technology program is more on the skills and education that technician-level workers need and employers are seeking. It's more practical-oriented than an engineering program. [See sidebar for program courses.]

Stewart: One of the founding philosophies of the college is that what you know is more important than where or how you have learned it. A tremendous amount of



Stewart

industry training has been evaluated for college-level equivalency that can be used toward our degree program. When a student applies to Excelsior, we are able to give college credit for the completion of courses from the Navy's Nuclear Power School or from the industry's accredited training programs. We are then able to add in the courses that the student needs to complete our program, including courses in liberal arts and the humanities,

in order to develop the student's critical-thinking skills. When students graduate from our program, they have obtained knowledge in technical areas as well as in areas that make them more well-rounded and better equipped for decision-making and for participating in group and management activities.

Could you give examples of credits transferred on a student's behalf?

LeClair: A student who had been in the nuclear Navy, for example, might come in with as many as 50 credits based on experience in the Navy's Nuclear Power School.

A student who has worked at a nuclear plant and was certified there through accredited operations training programs could get anywhere from 30 to 50 credits for that work. We give students credit for programs that have been reviewed by our faculty or the American Council on Education and that have been legitimately approved.

How do you match up a student's previous credits and training with your degree requirements?

Insogna: As advisors, we evaluate each student's transcripts or certifications and compare them with the program's requirements and curriculum. There could be students who are only 12 credits away from earning their bachelor of science degrees based on the transfer of credit from either the military, accredited industry training, or college classes that they have already



Insogna

taken with us or elsewhere. We are able to evaluate that and apply it to the program. If something is missing, the student will work with an advisor to plan how to finish the program, which for working adults, typically takes two to three years, depending on their work schedules.

At the time the program was accredited at Excelsior, the feeling in the United States was that nuclear power was ratcheting down. Why did you start growing your program at that time?

LeClair: We did that because we saw a need within the nuclear industry. My background includes work at the Nine Mile Point nuclear plant in several areas, including training, for 20 years before coming to Excelsior. One of the first things I

did while I was there was to contact the college—Excelsior was called Regents College at the time—to try to establish a program specifically for workers at our plant. This was in the early 1990s. I knew even then that our people needed college degrees. At that time, before our program was accredited by ABET, Excelsior offered a degree program in nuclear technology. Then, when the college sought ABET accreditation, the best fit for the curriculum was in nuclear engineering technology, so that is what it became. One of the things I did was to try to get the plant's employees enrolled in the college

“We have people from about 30 nuclear plants who are enrolled in the Nuclear Engineering Technology program.”

and to help them determine what courses they needed so that they could move up the industry ladder. As plant workers, they were adult learners who couldn't readily make themselves available to physically go to a college that offered such a program. After all, most nuclear plants are located away from major population centers, and there usually aren't colleges nearby that offer nuclear programs. Even if there were, the employees are shift-workers and they wouldn't be able to get to the classes on a regular basis.

Insogna: In many ways, the Three Mile Island-2 incident in 1979 was a pivotal point in the industry. Back then, we had faculty members who were charged with and were part of the effort to determine how to educate the industry's employees and how to make sure that they had the necessary background and education for the job. And so, the college developed its program in response to industry needs and in collaboration with the industry.

How many instructors do you have for your 650 students?

Stewart: We have about 20 instructors for the program. Some are located here at the college, but most are already teaching at other institutions. They generally are tenured faculty somewhere else or are senior practitioners in the industry, and they work through Excelsior to provide the distance education.

How does Excelsior's distance learning work, and is it interactive?

LeClair: Distance learning simply means that faculty and students are not in

Nuclear Engineering Technology program courses at Excelsior

A bachelor of science degree in Nuclear Engineering Technology at Excelsior College requires the completion of 124 credit hours. The curriculum consists of the following three components:

■ **Arts and Sciences** (60 credit hours), which consists of *Arts and Social Sciences/Humanities* (24 credit hours), with core courses in English Composition, Ethics, and Communications; *Mathematics and Natural Sciences* (24 credit hours), with core courses in Math (Algebra, Calculus I and II) and Natural Sciences (Physics I and II with lab, Chemistry with lab, Atomic Physics, Nuclear Physics, and Thermodynamics); and *Arts & Sciences Electives* (12 credit hours), which can be in any of the above Arts and Sciences disciplines, but

most often are used by students for courses that provide them with more in-depth study in areas specific to their respective occupational specialty, such as reactor operator, health physics technologist, and chemistry technician.

■ **Nuclear Engineering Technology** (48 credit hours), which includes Electric Theory, Computer Applications, Materials Science, Nuclear Materials, Health Physics/Radiation Protection, Radiation Measurement Lab, Plant Systems Overview, Reactor Core Fundamentals, Fluids, Heat Transfer, and Integrated Technology Assessment.

■ **Free Electives** (16 credit hours), which can be classes in any college-level subject.—R.M.

the same place. But because they are not together, that doesn't mean that they don't interact. There are a number of ways that faculty and students can interact, and students interact with each other. Our online courses

They can interact with faculty at times other than when the course is live. It is common across all of our programs, and especially in this program, where we will have students engaging each other in discussions

“In April 2008, Excelsior received a student section charter from the American Nuclear Society, the first one in the country for an online education program.”

es are not just classroom materials posted to the Web. It takes a team made up of faculty, instructional designers, and IT professionals to bring them “to life,” and online courses can employ all sorts of technology. Otherwise, just like classroom-delivered instruction, they are prepared ahead of time and they carry weekly assignments. The courses could have a “live chat” in there as well. The courses are delivered on a semester calendar with 15 weeks per semester. We have standard texts that everybody in the nuclear engineering business uses. Course-wise, everything is pretty standard.

Stewart: The courses are interactive, but not all the activity takes place at the same time. They are available asynchronously because students doing shift work at the nuclear plants aren't always available when the live chats are going on. But students have the benefit of the archived discussions between the instructors and other students.

about real-world situations at their respective facilities and how they may have dealt with them, or how the course work they are doing is helping them to deal with situations they are facing at their own facility. We could have someone in New York online with others in Wash-

ington state and Alabama and Mississippi, or onboard a ship in the Navy.

Could you review some of the hands-on aspects of your program?

LeClair: From a strictly academic perspective, our students must complete five lab requirements. Since our students are largely working in the industry while earning their degrees, however, they have the opportunity to see the application of what they are learning every day on the job. They work side by side with experienced individuals who can mentor them. The meaning of “hands-on” for Excelsior students goes beyond lab simulations and is a part of their everyday routine.

Does your program offer online laboratories?

LeClair: We are in the process of developing labs in the nuclear program, specifi-

cally for radiation measurement. One lab would be for nuclear materials and two others, for physics. We already have labs in our ABET-accredited Electronics Engineering Technology program.

Do you have collaborations with other organizations to feed students into your program?

Insogna: We have articulation agreements with community colleges, and we've also established partnerships with several organizations in the industry. For example, we have teamed up with Constellation Energy and the International Brotherhood of Electrical Workers to make our programs available to their employees and members. We work with EPCE [the Energy Providers Coalition for Education], and we have assessed training programs for college credit from General Physics Corporation and Idaho National Laboratory.

How are your ANS student chapter meetings conducted?

LeClair: Online, of course. In April 2008, we received a student section charter from the American Nuclear Society, the first one in the country for an online education program. Currently, about 150 students are members of our section, and over 60 of those are members of the national ANS. We hold our ANS meetings online because our students are everywhere. We have an array of wonderful speakers who come in and give our students the opportunity to get a feel for the industry. One of them was Dr. Robert Long, who is an ANS past president and an Excelsior faculty member. The current ANS president, Dr. William Burchill, is scheduled for our online meeting in June.

Insogna: The feedback we get from the students is that being a member of the ANS Student Section is a great networking opportunity.

Does the nuclear industry have input into your program?

LeClair: Yes. We have a very active Industry Advisory Council, which is made up of people who are currently in the field and includes representation from utilities. They meet with our dean, Dr. Murray Block, to make sure that we're staying abreast of current and future changes in the industry. They look at whether our graduates are ready to go right to work, and whether the quality of our program is meeting the needs of the industry. One of the selling points of our program is that utilities are waiting to hire our students once they graduate. Our graduates are now working at a number of plants, including Indian Point, Nine Mile Point, Diablo Canyon, Turkey Point, and Palo Verde. There is such a need for people in the industry that students rightfully see our program as part of their career path. **■**