



Monday, 01 February 2010

Engineers on the Homefront

Shortage of quality workers still exists, but schools are working to turn situation around in time for huge potential projects.

By Louise Freeman

The University of Alaska, high schools in Anchorage and Fairbanks, as well as nonprofit corporations and private industry are making great strides in addressing Alaska's chronic shortage of engineers.

Despite their efforts, the shortage is expected to grow at least through 2016, with an average of 50 new engineer jobs being added each year, according to the Department of Labor and Workforce Development's occupational projections. In addition, each year another 70 openings will become available through turnover and retirement as more and more baby boomers reach retirement age.

'Overwhelmed'

"What's coming for us is the potential for these large projects, like the gas pipeline. What we're finding is that if these hit, we're going to be overwhelmed," said Gerry Brown, president of the Anchorage Chapter of the Alaska Society of Professional Engineers (ASPE). The U.S. Army Corps of Engineers is also anticipating new large-scale projects that will require more engineers, including "projects to address the risks villages are experiencing on the coastline, and other flood, erosion or thawing permafrost areas," said Trish Opheen, chief, Engineering Division Alaska District. "I anticipate emergency evacuation roads and emergency shelters to be the first phase. We know there are upwards of 10 villages that are in need of 'immediate' actions."

'Revolving Door'

Recruitment of new engineers to tackle such projects is always a problem in Alaska, with high turnover rates despite attractive starting salaries of \$50,000 to \$80,000. "People stay only two, three, five years. It's a revolving door. They learn about how to do engineering in Alaska and then leave," said Robert Lang, dean of the UAA School of Engineering. Many of the engineers working in the state are nonresidents. Half the state's 5,000 licensed engineers retain out-of-state residence addresses, according to the Alaska Division of Occupational Licensing's Architecture, Engineering, and Land Surveying Board.

The U.S. Army Corps of Engineers has found that filling job openings with engineers from outside Alaska is an expensive solution to the ongoing shortage. Costs for relocating new employees is high, said Opheen, with additional expenses for extra training in dealing with cold region design and the logistical challenges presented by the remoteness. The Corps recruits engineers through the UAA and UAF job fairs, national level job fairs through various professional organizations, and the Army's and their own internship programs.

Homegrowns Needed

In an effort to create more homegrown engineers and to keep the work in Alaska, the University of Alaska is scrambling to meet present and future industry demands by expanding their engineering programs at UAF and UAA. In 2006, the university graduated just half of the national average of engineers per capita, according to the American Society of Engineering Education. Three years ago, the Board of Regents set the goal of more than doubling the yearly number of engineering graduates, aiming for a total of 200 a year by 2012. In 2009, the number of baccalaureate graduates reached 94.

"Employers are clamoring for more graduates," said Lang. Both UAA and UAF offer baccalaureate and/or master's degrees in such standard areas as civil, mechanical, electrical, and environmental engineering. In addition, UAF's College of Engineering and Mines offers degrees in geological, mining and petroleum engineering. UAA also offers a bachelor's degree in geomatics, a relatively new field involving land surveying and the use of GIS and other types of earth mapping. Both universities are unusual in that students may earn a degree in the growing field of Arctic engineering.

High Hopes

The university is expanding capacity in its engineering program as fast as it can. UAA hired eight new professors in the school of engineering this year alone; however, the school is hampered by a building that is too small and lacks lab space. UAF's College of Engineering and Mines also suffers from inadequate facilities, with a pressing need for more lab as well as teaching space. UAA and UAF have submitted a total of \$10 million in capital budget requests for fiscal year 2011 for the planning and design of new facilities. In addition, a pre-engineering program, now in its second year, is currently being developed at the University of Alaska Southeast.

"Our numbers are still small as we are still a very new program, but they are growing," said Program Coordinator Lori Sowa. "The program has a lot of support from the local engineering community."

With retention of engineers a continuing and thorny problem, many engineering firms are focusing their recruitment efforts closer to home: they hope to attract new engineers fresh out of the University of Alaska.

"To get a young engineer, you have to establish a relationship with him when he's still in college," Brown said. "So most of the time, if you don't have an internship program, then you are missing an opportunity. Internship is huge if you're in Anchorage."

Mentoring Programs

There is an increasing awareness that the mentor-student relationship may need to be established even before the college level through mentoring programs aimed at high school students.

"We're just about to get started in Alaska," said Pamela Mullender, president of the ACE Mentor Program of America, a nonprofit corporation whose goal is to attract high school students nationwide to the fields of architecture, construction and engineering. ACE is currently recruiting mentors and hopes to have a program in place in Alaska by early 2010. Both ACE and ASPE offer scholarships to students who intend to go into engineering.

Kids Too

UAA also has a strong K-12 outreach program. One highly successful program is the Alaska Native Science & Engineering Program (ANSEP). ANSEP works with students from the time they are freshmen in high school all the way through graduate school with the goal of increasing the recruitment and retention of Alaska Native students in the fields of science, technology, engineering and mathematics. Components of this innovative program include summer bridge programs, student cohorts, peer and professional mentoring, and internships.

"ANSEP opens the door for a lot of students throughout Alaska who are interested in what we have to offer," said Lang.

The UAA School of Engineering recently started working with Dimond Engineering Academy, a school within a school at Dimond High School in Anchorage. Of the 200 students enrolled in the school, now in its second year, Lang said, "Those are great potential future students for us." A similar program exists in Fairbanks at the Lathrop Engineering Academy at Lathrop High School. The academy, also started in the '08-09 school year, currently has approximately 130 students taking engineering classes, including several classes in robotics. Each year the academy holds a robotics competition, which is sponsored by UAF.

"They get really good hands-on exposure to equipment so they'll have a pretty good idea what they're getting into at the university," said Larry Ehnert, lead teacher at the academy.

With all these high school and college students in the engineering pipeline, it can be expected that within a few years, the number of new engineers entering the field in Alaska will rise. With luck, many of these new engineers will choose to stay in Alaska and help address the unique engineering challenges presented by the state's physical geography and climate.