

by Kathryn Levy Feldman

High-voltage Entrepreneur


Erik Limpaccher '01 fights to bring his power companies to life

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Erik Limpaccher '01 has started not one but two power technology companies, doing some of his work from his dorm room.

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Princeton senior and electrical engineering student Erik Limpaecher arrived at Princeton from Andover with the intention of becoming a physicist, like his father, but he was hardly in a hurry to do so. "I slept through my freshman and sophomore years," he admits. "I was cocky, lazy, and unmotivated."

An e-mail from a Marine Corps recruiter changed all that. For Limpaecher, whose parents are both from Germany, the idea of becoming a Marine appealed to his strong sense of civic duty. "It was a way of giving back," he says. "The United States gave my father, a farm boy from Germany, so many opportunities that I wanted to serve my country." Following a lengthy application and screening process, Limpaecher was accepted into Marine Corps Officer Candidate School and spent the summer after his sophomore year in Quantico, Virginia, at the first of two required six-week boot camp sessions.

"It was hot, humid, and incredibly motivating," Limpaecher says. In short order, Candidate Limpaecher was "hitting the rack" (going to bed) at 2200 (10 P.M.), rising at 0500 (5 A.M.), hiking through the woods with a 60-pound pack, and learning to be responsible not only for himself but for his platoon. "If someone made a mistake, it was the entire platoon's fault," Limpaecher explains. Conversely, a great job was never great enough. "If your area was clean, the officer would ask you why the one next to you looked like a rag," he says.

Back on campus for his junior year, Limpaecher found himself a changed person. "My attitude and actions totally changed during the first summer of OCS and I never reverted back to my old self," he says. "Months after leaving OCS, I would still go running with combat boots in the rain just to stay in the rhythm of working out every day."

The transformation could not have come at a better time.

Limpaecher and his father, Dr. Rudy Limpaecher, had written a patent for a power conversion technology during Erik's sophomore year, forming a company called NewVAR. Soon after Erik's first experience with Marine boot camp, Rudy secured an angel investor to fund a prototype of the product, called a VAR compensator (VAR stands for Voltage-Ampere-Reactive). The compensator delivers "clean" (purer) power without specialty hardware at a significantly lower cost, higher efficiency, and better quality than existing systems.

In January 2000, Limpaecher, his father, and a technician began to construct the prototype in the Limpaecher garage. Last summer, they completed the work and installed the compensator in leased lab space in Massachusetts. And last fall, to fulfill the class project requirement for ELE 464: Embedded Computing, Limpaecher and his lab partner John Lerch '01 decided to design, program, debug, and implement the control system for the prototype.

But it was in Professor Ed Zschau '61's course, High-Tech Entrepreneurship (ELE 491), which Limpaecher also took last semester, that all the pieces began to come together. "Before I took ELE 491, I knew about NewVAR's technology, but I knew very little about what makes a successful startup company," he says. The course, which introduces students to

the analysis and actions necessary for launching a successful high-tech company, changed that. "Professor Zschau's class made me more technically and tactically proficient and emphasized the importance of making sound and timely decisions," Limpaecher says. "Plus his personal example showed me the enthusiasm, initiative, and knowledge necessary to succeed in the startup world." All of these skills, Limpaecher stresses, are Marine Corps principles and tenets.

Limpaecher wrote an analysis of the commercial potential of the new AC-AC conversion technology — part of his patent — to fulfill one of the requirements in Zschau's course, and Zschau is serving as an independent adviser to another Limpaecher startup venture called Power Silence, which is developing a 1MW voltage regulator for industry and manufacturing consumers in the growing \$5.78 billion power quality market.

Limpaecher is learning firsthand about the volatile nature of startups. "It is exciting but sometimes frustrating work," he says. He and Lerch recently tested the NewVAR prototype over a full AC cycle, to prove, beyond a doubt, that the technology is viable. They are currently working on making the unit run continuously at twice the speed. They're also trying to find NewVAR a partner in the Mexican power industry; Limpaecher spent four days of his intersession break with his father, the NewVAR CEO, and NewVAR's angel investor in Mexico City negotiating with Conduemex, Mexico's largest utility company, for a possible deal. Last fall, promising discussions with Conduemex about manufacturing the system in Mexico disappeared when their contact with the power company changed jobs. "We were this close," Limpaecher indicates with his fingers only slightly spread.

On the Power Silence front, the story is similar, though a chapter or two behind. Limpaecher recently persuaded Lerch to forgo a consulting job to work with him on the company, and Zschau is helping them in their search for angel investors and/or strategic partners to fund their prototype. "We're basically looking for advice on how to do it right the first time," Limpaecher explains.

On the technical front, their work is gaining notice. Limpaecher's father's employer, Science Applications International Corporation, recently received a large contract from the Office of Naval Research to investigate the Power Silence technology's variable-speed drive applications. "SAIC is helping develop the technology in parallel," Limpaecher explains. "They're not a utility, so they're not a potential client, and they're not involved in the commercial aspects of the technology, so they're not a competitor." Best of all, Limpaecher and Lerch are getting compensated as consultants to SAIC.

Limpaecher admits that both NewVAR and Power Silence have a long way to go, but he refuses to be deterred. "I learned you have to eat, sleep, and breathe your company with a passion in order to make it happen," he says. "One of our speakers [in Zschau's class] told us that if you are going to start a company you have to will that sucker into existence. My companies are my passion, and I'm determined to make them work." ■

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