Practicing what you teach

Sarah Fister Gale

As a boy in Alexandria, Egypt, Sami Rizkalla dreamed of becoming an engineer.

"Engineering was the ultimate profession in Egypt at that time," he says.

He studied hard and received a full scholarship to Alexandria University. When he graduated in 1965 he was invited to become a university instructor while he worked on his master's degree. At the same time, he joined his professor's consulting firm designing reinforced concrete structures.

"I was very fortunate to be able to work with my professor, Dr. Gouda, who was a famous structural engineer in Alexandria," he says.

> *"Before I do any research, I consult with PCI members and ask them about the problems they face. Then I look for solutions. There is nothing better than being able to provide a solution that industry can use."*

After graduating from Alexandria University, Rizkalla worked there as a full-time instructor during the day and practiced as a structural engineer well into the night.

"I had the privilege of designing many unique structures during that time, including an open-air thin-shell concrete theater that is still in use today," he says.

Those early days of working in both industry and academia shaped Rizkalla's approach to his career in concrete.

In 1971 he moved to the United States to pursue his doctorate at North Carolina State University in Raleigh on another scholarship. His doctoral research was on segmental construction of nuclear cooling towers. His advisor, Paul Zia, was a founding member of PCI and one of the pioneers of the precast concrete industry.

"Paul became like a father to me, both academically and personally," Rizkalla says. "He got me involved in many projects over the years. I was very lucky to have the opportunity to work with him over many years."

Upon completing his PhD, he became a postdoctoral fellow at the University of Alberta in Edmonton and then a professor at the University of Manitoba in Winnipeg, where he taught for more than 20 years. Much of his research related to critical industry challenges, and his work focused on the use of prestressed, precast concrete for load-bearing wall panels. He also developed the first shear key connections, which are used to attach precast concrete shear wall panels.

In 2000 he returned to North Carolina State University as a Distinguished Professor of Civil Engineering and Construction and director of the Constructed Facilities Laboratory.

"It was a very attractive opportunity I couldn't turn down," he says.

Rizkalla continues to teach, conduct research, and work with members of the industry to solve key design problems. That combination of industry and academia has allowed his career to thrive.

"My success as a professor is based on the fact that I have had hands-on experience in the industry," he says.

That experience helps him engage and excite his students about real-world applications for prestressed, precast concrete. It also steers his research toward the real-world challenges faced by industry, such as how to reduce cracks in L-shaped ledge beams and how to strengthen precast concrete systems using fiber-reinforced polymers.

"Before I do any research, I consult with PCI members and ask them about the problems they face. Then I look for solutions," he says. "There is nothing better than being able to provide a solution that industry can use."

His commitment to providing real-world solutions helped him win several PCI awards over the years, including the Harry H. Edwards Industry Advancement Award for the Taylor Smart Highway Bridge in 1999, the distinguished educator award in 2008, and the Charles C. Zollman Award in 2012. The American Society of Civil Engineers named him one of the recipients of the T. Y. Lin Award in 2013.

Rizkalla says he hopes that the next generation of PCI members will also see the value that such industry-academic partnerships can bring.

"We can't function unless we work together," he says. "Industry identifies the problems, and researchers provide the answers. That's how innovation happens."