

ENGINEERING STAR



## Marybeth Miceli: Engineer, Pioneer, and Advocate

[By Akbar Ali]

Marybeth Miceli is perhaps the rarest of the rare when it comes to engineers: young, outspoken, female, and on a mission. As chief operating officer of Material Technologies Inc., a research and development company which creates new measurement and monitoring technologies for metal structures and equipment, she is responsible for overseeing the company's innovative efforts in detecting metal fatigue and cracks on bridges and railroads. She is also an award-winning expert whose professional crusade has been to spread awareness of the importance of nondestructive evaluation and testing methods.

Miceli's attraction to engineering was rooted in her lifelong passion for scientific study and innovation. She had originally enrolled as a civil engineering major at Johns Hopkins University when something caught her attention the first week of class: an article by Dr. Robert Green in the materials science department, who, at the time, was the head of Hopkins's Center for Nondestructive Testing. Reading that article proved to be a pivotal turning point in her career, introducing her to the different kinds of technologies utilized to diagnose structural issues in bridges.

"I changed my major and went to work in one of Dr. Green's laboratories my freshman year. I've been in the nondestructive evaluation and testing field ever since," she says.

The materials science and engineering department at Johns Hopkins was the most influential factor in Miceli's decision to pursue engineering. The university served as the base for the Center for Nondestructive Evaluation during her time as an undergraduate, providing her and others with a dynamic outlet for NDE research and innovation.

She recalls, "As an undergraduate I was able to participate in many NDE research projects and present my results at the CNDE annual meeting. It was a tremendous opportunity."

The university also allowed her to establish important contact with individuals at the Federal Highway Administration, later leading to an internship in its NDE Validation Center.

While at Johns Hopkins, Miceli further immersed herself in the engineering discipline by becoming involved with several organizations. She served as co-president of the student chapter of the Materials Research Society and was a member of the American Society for Nondestructive Testing (ASNT), of which she is now director. It wasn't all science and engineering, though,

for Miceli: she managed to find time for an a cappella singing group and the university theater troupe.

She continued her education in engineering by pursuing her Master of Science degree at Virginia Tech, where she studied under Dr. John C. Duke, a former pupil of Dr. Robert Green. Her thesis project dealt with the subject of infrared thermography damage detection of FRP bridge decks in the laboratory and in the field.

Miceli landed her first job after graduation at Lucius Pitkin Inc., a failure-analysis firm in New York City. Her primary duties included working on a multitude of high-profile and critical local projects, including the remaining life assessment on train fleets for the Long Island Railroad, testing of the antenna of the Empire State Building, roof stress analysis of the Miller Park baseball stadium, and six months of condition assessment of the remaining buildings at Ground Zero in the aftermath of the attacks on September 11. The challenges of such projects were substantial, but Miceli was able to consistently utilize her background in civil infrastructure, failure analysis, and quality assurance to meet their demands and simultaneously implement new procedures and technologies for future use.

Shortly thereafter, Miceli began working with a new client, Material Technologies

**Q. What do you do for fun?**

**A.** Play my flute and sing. Watch and play sports. Hang out with my husband (he's a lot of fun).

**Q. What CD is in your CD player right now?**

**A.** *Joni Mitchell's Greatest Hits.*

**Q. What is the last magazine you read?**

**A.** *The Week.*

**Q. What is your favorite TV show?**

**A.** Of all time, it was *Alias*. On a regular basis, it's Mets baseball, Giants football, Devils hockey, and Jazz basketball.

**Q. Who is your role model?**

**A.** My mom.

**Q. What makes you laugh?**

**A.** My husband, Damien.

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(MATECH), which was involved in developing a specialized sensor designed to detect growing cracks in bridges. In light of the recent tragic collapse of the I-35 W Mississippi River bridge in Minneapolis, public demand for such industry innovations has increased exponentially, particularly as a number of studies have noted that more than 73,000 bridges nationwide are classified by experts as “structurally deficient.”

Miceli continued her association with MATECH after she moved on to Sam Schwartz Engineering, PLLC, in New York, where she served as the director of infrastructure engineering, ultimately being recruited to the position of MATECH’s COO.

The most memorable moments of Miceli’s career thus far have been the most challenging: testing the antenna of the Empire State Building, conducting roof stress analysis of the Miller Park baseball stadium (“I was on the roof performing strain-gage installation and analysis”), and her work with Lucius Pitkin performing condition assessment of the Manhattan buildings left intact in the area desecrated by the September 11 attacks.

Miceli says her time spent at Ground Zero taught her an invaluable lesson about the resilience of human beings confronted with profound devastation. While working at Ground Zero she observed that “tremendous feats can be accomplished when people pour their hearts and souls into their work.”

A decidedly less intense experience came when she served as the transportation engineer project manager for the New York Mets baseball team while working at Sam Schwartz Engineering:

“I worked with them for over a year as they managed the challenge of constructing a stadium in an urban environment within the current parking lots. It proposed a parking and transit challenge that many agencies had to team up together to solve.”

In 2004, Miceli received a Young NDT Professional Award. She also won a research scholarship from the ASNT in 2000 and has had numerous articles published in *Materials Evaluation*, the ASNT’s monthly journal for nondestructive testing, evaluation, and inspection.

Miceli confesses that there have been countless mentors and colleagues who have played key roles in her career, but the most important have been her parents, who have demonstrated to her the ability to balance a career with a personal life. She also credits her current boss, Robert M. Bernstein, with having afforded her “tremendous opportunities.”

With so much successful experience under her belt, Miceli advocates four key points to young professionals just starting out:

“Pay attention to the details. Learn how to communicate in writing and orally. Be patient. Do what you are passionate about.”

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