



Defending the  
**Public**



## Professional engineers must adhere to a higher calling to use their skills to protect the public welfare and improve society—no matter the consequences.

BY DANIELLE BOYKIN

**N**SPE'S CODE OF ETHICS CALLS ON ENGINEERS to hold paramount the safety, health, and welfare of the public. Professional engineers must commit themselves to using their technical skills and knowledge for the betterment of society. However, the duty to protect the public isn't always about making decisions that may have life or death consequences. Protecting the public welfare also means that engineers must safeguard the well-being and quality of life in their communities. Engineering ethics experts shared with *PE* their insights on how engineers can adhere to the highest calling of the profession.

The role that professional engineers play in protecting the public can be experienced in various ways and in many different sectors, including government, private practice, and industry. Curtis Beck, P.E., F.NSPE, past chair of NSPE's Board of Ethical Review, believes that the first question an engineer must answer is: What is the appropriate level of safety, health, and welfare that needs to be maintained to hold this obligation paramount? "Engineers have been active participants in the development of industry standards, design codes, state and county building codes and ordinances, and government standards," says Beck, who serves as a manager with the Hawaii Electric Light Company in Hilo. "Once society has consensus on the appropriate level of protection for the public, the role of the engineer is to be the guardian of these standards and codes, and to assure that they are consistently and appropriately applied to the design and construction of products and facilities for public use."

Engineers protect the public welfare by making life better for people, says William Lhota, P.E. Lhota's 37-year career in electric power production and delivery allowed him to provide a valuable service to enhance the well-being of the public. "Many of the things we did supplied a reliable product that provided comfort to people and necessary power to hospitals, television and radio stations, and police stations," says Lhota, a past chair of the BER. "Everything that enhances the life of the general public."

When it comes to seeking guidance from the Code of Ethics and how it applies to professional duties, Lhota recommends against reviewing the Code in isolation. "You've got to read the Code totally, and some canons will conflict," says Lhota, who recently retired as president/CEO of the Central Ohio Transit Authority. When in doubt, look to the number one canon: Hold paramount the safety, health, and welfare of the public. "In my opinion, that trumps all other aspects of the code," he says.

#### Courage of Your Convictions

Engineers must be willing to follow the Code of Ethics regardless of the consequences, says Lhota. "It is not easy when a job is at risk or the company is in trouble, but ethics is not something that can be followed just in good times and ignored in bad times," he says. "You have to have the courage of your convictions and do the right thing every time."

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In his 50-year career, Neil Norman, P.E., F.NSPE, has worked in a variety of engineering positions for seven companies. In six of those companies, Norman was asked to do things that he considered fraudulent or unethical. Each time, he refused. "The Code of Ethics is demanding, and for some individuals it will be tough to meet the required responsibilities," says Norman, who serves as a corresponding member of the Board of Ethical Review (BER). "It requires you to be



willing to look your employer or client in the eye and say, 'No, I can't commit that fraud,' or 'No, we can't build it that way,' or 'No, we can't launch the shuttle in this weather.'"

When a drought struck San Francisco during the 1980s, city officials decided to stop irrigating Golden Gate Park and other parts of the city—essentially allowing some of the trees, grass, and flowers to die. Norman and other engineers decided to speak up in the interest of the public welfare when they advised the city to use gray water (which was being pumped into the Pacific Ocean) to safely irrigate the parks and other green space. The city

refused. "We wrote an articulate letter to the *San Francisco Chronicle* newspaper. The city eventually started using gray water after this information got out to the public. They are still using it to this day," he says. "We said, 'Look, if you won't do what makes sense, maybe someone else can talk you into it.' This wasn't a life or death situation, but it was in the public's interest. It didn't cost any money and it saved a public park."

Honest ethical practices will most likely produce a product that will fulfill the intentions of the engineer who designed it and meet public expectations, says BER Chair Michael Shirley, P.E., F.NSPE. "This contributes to welfare in the sense that the public will be satisfied because the product works properly," he says. "This is a softer side of protecting the public welfare."

Shirley's career in the automotive industry often required him and department colleagues to put the public's welfare first by lobbying within the company to convince nonengineering supervisors that additional testing of product components were needed, regardless of the expense. "Manufacturers who did not properly test and make changes to the products ran a higher risk of having to make safety recalls," says Shirley, the owner of Innovators Research Inc. in Waterloo, Indiana. "Safety recalls don't always involve personal injuries, but they always involve extra expense. You may have to pay a little more upfront to have the product be in a more robust form. We made wise choices, and we were successful in bringing the products up a notch and to a higher level of performance."

If an engineer is asked to create a product or perform a service that could be harmful to a user, he or she has to make it a priority to persuade the supervisor of the risks involved and to work through a process within the company. "There are technical ways to do this through a structured risk analysis. If that's unsuccessful,

try and take the concern as far up in the company as you can," says Shirley. "Try to keep the issue in the company as long as possible. If it's still not resolved, that's the point where the engineer needs to take it to an external source, such as an industry or governmental agency."

When Angela Newland, P.E., F.NSPE, thinks of how to protect the public, she believes in being proactive to solve potential problems in order to do what's best for the general population. "If professional engineers and their organizations take the time upfront to address issues that can affect the public welfare, whether it's sustainability or climate change issues, in the long run it may require less money, time, and resources," says Newland, assistant director of aviation-airport development in the Broward County Aviation Department in Florida.

Newland is currently dealing with an issue of putting health, safety, and welfare first by protecting her fellow employees. Her department recently discovered that new rules issued by the Federal Aviation Administration do not protect the workers who are responsible for maintaining the airport runways. "If you think that a rule or law is not covering some aspect of the public welfare, it doesn't mean it shouldn't be changed to do so," she says. "We initially submitted what we thought was a good change, but they rejected the change. Now we are providing more details to help support our case."

Newland's advice to professional engineers who are involved in a situation where they see a potential risk to the public welfare is to use the company or organization's mission statement to support their case. "Most employers have a mission statement or strategic plan that addresses ethical conduct and not just focusing on making a profit," she says. "An individual can use that mission to make his or her case to do what's right for the public."

### Building Relationships

Professional engineers can initially improve how they protect the public welfare through continuing education and staying up to date on the latest technologies, codes, and regulations. The ability to form and maintain positive working relationships is a skill that a professional engineer needs in his

arsenal to get a product or service delivered in a manner that also protects the public. "Relationships are important for engineers in trying to get their values across to other employees in the company who approach the same product with a different goal in mind, such as keeping costs low and maximizing profits," says Shirley. "You, as the engineer, need to help them understand how you see products from an engineering standpoint and how it will benefit the company in the end."

Lhota recommends that professional engineers network and have peers that they can turn to when they need a clearer understanding of an issue. "It's important to do some research and get other ideas. As you escalate that issue, get other opinions," he says. "You always want to have a good friend before you need a good friend, or a good colleague before you need a good colleague."

Norman says that being professionally competent and ethical are just two components necessary to ensure that professional engineers can protect the public welfare. Engineers must be prepared to make an articulate argument to support his or her judgment. They will need good communication skills to effectively get their message across, particularly to nontechnical professional colleagues and clients. "I've had people work for me who were technically competent and 100% ethical, but they couldn't communicate with the client effectively and with the right [temperament] and approach," he says. "You've got to have empathy for the person that you're talking to. They have a point of view and a reason for having it."

What if the client or supervisor continues to disagree? "If the client insists on a plan of action that will violate the law or endanger the health, safety, or welfare of the public, the engineer must withdraw from the project and may have to argue the issue at a higher level in the company or even publically," says Norman.

Norman realizes that standing up for the public welfare means that the engineers must prepare to put their contract or even their employment on the line. "They may fire you, but you've got to hold your line anyway," he says. "Some of us believe that honor and integrity are more important than a job. I do." ■

## A PE's Courage

On January 28, 1986, what should have been an inspirational event for the nation quickly turned into tragedy as NASA's space shuttle *Challenger* exploded, killing seven crewmembers. Roger Boisjoly, P.E., and other engineers warned management that the O-ring seals in the shuttle's booster could fail in cold weather. This disaster should have never happened.

Almost 10 years after the tragedy, Boisjoly shared his story with *Engineering Times* in the August 1995 issue. He detailed the effort to prevent a launch of the shuttle and the professional and personal aftermath of the event.

Boisjoly died on January 6 at the age of 73 in Nephi, Utah. The courage that he showed by speaking up serves as a lasting testament to the duty that professional engineers have to protect the safety, health, and welfare of the public—no matter the consequences.

*Read the complete Engineering Times article on the NSPE Blog at <http://community.nspe.org/blogs>.*



VIEW FROM BELOW OF THE LAUNCH OF THE STS 51-F *CHALLENGER* CAPTURED BY A 35MM CAMERA MOUNTED IN A FIREBOX ON THE ROTATING SERVICE STRUCTURE ON PAD 39A AT THE KENNEDY SPACE CENTER.