Walking the fine line of everyday ethics

Ever faced a sticky situation involving conflict of interest, signing and sealing another engineer's plans, rushed software testing, or perhaps moonlighting? These are just a few of the ethical dilemmas engineers typically face.

by Rachel Davis

To this day, retired professional engineer Richard Simberg remembers an unethical omission he made as a young engineer. While working in structural building design, he was called into the head architect's office, handed a set of shop drawings for a medium-sized office building, and instructed to have the drawings marked up and sent back the next day by any means necessary. Unable to get a week's worth of work done in one day, he sent the drawings back after an inadequate review.

"Fortunately, the drawings were reasonably well done, the building survived construction, and is probably standing today," says Simberg. "But that was good luck, not ethical engineering, and I have always looked back on that instance with regret."

Today, engineers continue to face similar ethical dilemmas on the job that can leave them unsure about the right course of action.

Tough choices

"The most common ethical dilemmas usually involve choices where there are no obviously right answers and often where a choice must be made between unsatisfactory alternatives," says Simberg, a National Society of Professional Engineers (NSPE) Board of Ethical Review (BER) member, who was formerly chief engineer of the New York State Department of Transportation (NYSDOT). He uses the 1999 BER ethics contest scenario as an example of such a dilemma, in which an engineer had to choose between his client's demands for confidentiality and the possible jeopardy of public safety. Often, engineers' worries over blacklisting and termination, loyalty to employer and client, market competition and tight project deadlines can also make ethical choices more complicated.

"Engineers now assume much greater responsibilities at an earlier age and are under greater pressure to produce projects cheaper and faster, in situations where they are more like subcontractors than employees," says Simberg. "Under these circumstances, the need for detailed knowledge of engineering ethics should be obvious."

Sticky situations involving conflict of interest, signing and sealing of engineering plans prepared by another engineer, rushed software testing, moonlighting and using an employer's equipment, participating as a government official on work related to a former firm, and working in the private sector after leaving employment in the same public sector area can fall into the grey areas of ethics. When the pressures of some demanding managers and corporate cultures are added, finding the ethical solution becomes an even murkier prospect.

Ethical harassment

Walter Elden, a recently retired PE (licensed professional engineer), experienced an ethical dilemma about five years ago that he coined "ethical harassment." He was a system architect at a *Fortune 500* company working on a very large proposal for the Department of Defense. An engineer under his charge told Elden that he was asked to test a software product from a certain supplier, but that he had been given constraints in time and resources that would lead to an unfair evaluation of the product.

The marketing people favoured a competing product supplier and did not want this product to receive a shining evaluation. Elden, who had posted the Institute of Electrical and Electronics Engineers Inc. (IEEE) Code of Ethics on the wall near his desk, advised the engineer that it would be unethical for him to perform an evaluation under these circumstances, which got Elden's supervisors steamed. Although they threatened to remove him from the project, Elden stood his ground and explained his position to the program manager. Eventually, his supervisors agreed to allow more time for testing of the product.

Ethics and work culture

In some cases, engineers may also be surrounded by a work culture of "loose" ethics that makes distinguishing the ethical choice difficult. A Pennsylvania electrical engineer and PE, who wishes to remain anonymous, says he worked for a firm of consulting forensic engineers that was regularly using software it didn't own for business purposes. Management seemed to accept that employees were violating software licence agreements by obtaining software from a third party and making copies of it for use at different workstations. He claims that the company would also obtain Underwriters Laboratories Inc. and American National Standards Institute standards for use in accident investigations by renting them through interlibrary loans and photocopying them. "They were charging clients for the knowledge they get from this information, but they weren't paying for it," he says.

He was also uncomfortable when his boss berated another engineer for slightly changing his opinion based on new information he had discovered, although the firm's forensic engineers include a clause in their opinions stating that findings are "subject to change" if more information becomes available. The change of opinion went against the client's case.

For Simberg, who worked in executive positions with NYSDOT, the most common ethical dilemmas occurred when political demands started to override engineering concerns. One example involved the placement of an additional intersection on a congested highway that would have benefited a large business, but would have jeopardized public safety on that section of road, Simberg explains. Simberg sided with public safety, and after his superiors threatened to take the matter out of his hands and continue with the project, Simberg told them that he was prepared to "go public" with the story. That conversation stopped the project, but "after a few tense months, we restored our prior harmonious working relations," he says.

Stephen Unger, a professor of computer science and electrical engineering at Columbia University, has helped engineers work through their ethical dilemmas, while leading ethics efforts at the IEEE. In one situation, he recalls, an electrical engineer and PE working for a state university found that a manager two steps above him, although not technically knowledgeable, would often make estimates on the cost of a project without consulting with his engineers. When the project was getting into trouble, the manager would pressure engineers into cutting corners to meet his unrealistic (usually undervalued) estimates. When the PE specified some fire detection devices and emergency exit lights for a building that was being renovated to include offices, the manager removed these items to save a modest amount of money. The engineer was fired when he tried to defend his principles of professional ethics.

"State licensing boards are prepared, at least in principle, to penalize PEs who violate the Code of Ethics, but they are not prepared to help the ones who get in trouble when they try to abide by the Code of Ethics," says Unger, who believes that engineering societies could play a useful role by informally helping to resolve ethics-related disputes between engineers and their employers, before they escalate to destructive confrontations.

[PEO's Code of Ethics (section 77 of Regulation 941) is intended to guide professional engineers in their ethical behaviour in their working lives. In Ontario, a breach of PEO's Code of Ethics alone is generally not considered to be professional misconduct. Professional misconduct is defined in section 72(2)(g) of Regulation 941 as "a breach of the Act or Regulations, other than an action that is solely a breach of the Code of Ethics." However, situations that breach the Code of Ethics also usually involve professional misconduct.]

Making judgment calls

How should engineers face difficult ethics problems? They can consult the NSPE Code of Ethics, BER ethics case studies, a university dean or mentor and Web resources, such as the "Ethics" section of www.nspe.org (under the "Professional Issues" tab) or the Online Ethics Center for Engineering and Science located at http://onlineethics.org/.

[For a copy of PEO's Code of Ethics, see www.peo.on.ca/EngPractice/guidelines.htm. PEO's *Guideline to Professional Practice* may also be a useful resource in dealing with common ethical issues, such as conflicts of interest and reviewing the work of another engineer. To obtain an electronic copy, visit the same hotlink. Printed copies of the professional practice guideline can be ordered by using the publications order form on p. 4 of *Gazette* or on PEO's website.]

Simberg recommends that engineers imagine the worst outcome has happened and that they must explain their decision in detail to a CEO, professional board or even a televised legislative committee. If they feel inadequate or ignorant, but sense that they have done their best, they have probably made an acceptable decision. "However, if you feel ashamed, it's time to start again and find a better course," he says.

"The fact that a problem has no easy answer does not mean there is no answer," says NSPE past president and professional engineer Paul Pritzker. And, after engineers have weighed all their choices and come to a balanced decision, they should accept the fact that some of their colleagues may not agree. "When one is right, he or she can be a 'majority of one,'" Pritzker says. ◆

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