Professional Ethics for Engineers

An Online Continuing Education Course for Engineers

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Edward P. Brunet, Jr., P.E.

A Short History of Engineering Ethics

One definition of ***Ethics*** is:

> *The rules or standards governing the conduct of a person or the conduct of the members of a profession.*

Prior to 1900, professional societies generally subscribed to the belief that ethics was a matter of an engineer's personal responsibility and not appropriate for a written code. The American Society of Civil Engineers (ASCE), for example, stated in 1877 "*that it is inexpedient for the Society to instruct its members as to their duties in private professional matters*."

The earliest codes of ethical conduct for engineers were developed in the early 1900's. The American Institute of Electrical Engineers (now "the IEEE"), published ethical codes in 1912. These contained no explicit reference to the public or to the environment. The loyalty was to the employer. The AIEE code stated: "The engineer should consider the protection of a client's or employer's interests his first professional obligation, and therefore avoid every act contrary to this duty." Likewise, the original Code of Ethics published by the ASCE in 1914 focused mainly on engineers' relationships with their clients and their peers, and did not address responsibilities to the public.

Throughout the early to middle part of the 20th century, professional societies began to recognize the need for Codes of Conduct to address responsibility to the public. On October 28, 1946, the Board of Directors of the National Society of Professional Engineers (NSPE) adopted a "Canon of Ethics for Engineers" that was prepared by the Engineers' Council for Professional Development (ECPD), which is now the Accreditation Board for Engineering and Technology (ABET). Among the provisions of this code was:

> *"As the keystone of professional conduct is integrity, the engineer will discharge his duties with fidelity to the public, his employers and clients, and with fairness and impartiality to all. It is his duty to interest himself in public welfare, and to be ready to apply his special knowledge for the benefit of mankind."*

Today, dozens of professional engineering societies have published codes of ethics, which have evolved since the early days to include responsibilities to both the public and the environment, as well as responsibilities to an engineer's employer. Most of these codes of conduct follow the ECPD/ABET model and are quite similar to each other. A good example is the Fundamental Canons of the Code of Ethics for Engineers published by the NSPE (refer to Page 2).

Note the subject of Fundamental Canon #1 – "Hold paramount the safety, health, and welfare of the public". The "safety, health, and welfare" of the *public* is front and center in the NSPE Code of Ethics, which demonstrates how much the priorities have shifted since the early 1900's. Protecting the interest of one's employer is relegated to Fundamental Canon #4 in the current NSPE Code of Ethics.

Fundamental Canons of the NSPE Code of Ethics for Engineers

1. ***Hold paramount the safety, health, and welfare of the public.***
2. ***Perform services only in areas of their competence.***
3. ***Issue public statements only in an objective and truthful manner.***
4. ***Act for each employer or client as faithful agents or trustees.***
5. ***Avoid deceptive acts.***
6. ***Conduct themselves honorably, responsibly, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession.***

Why is it Important to Study and Practice Engineering Ethics?

We reviewed one definition of Ethics earlier in the course. A second definition of ***Ethics*** is:

> *Motivation based on ideas of right and wrong.*

There is a moral component to *Ethics*. Engineers should be motivated to "do the right thing". Seems obvious, doesn't it? Of course, you want to do the right thing. So, why do you need to study E*thics*?

Why Study Engineering Ethics?

We need to go back to the first definition of Ethics: *The rules or standards governing the conduct of a person or the conduct of the members of a profession.*
It is important to study engineering ethics so that you will understand the standards governing what is acceptable behavior in the practice of engineering.

The standards governing acceptable behavior for engineers have been developed in the form of Codes of Conduct adopted by professional organizations, such as NSPE. These standards represent the collective experience of many learned professionals who have studied Ethics and have adapted the Codes of Conduct based on observing the impacts of engineers' actions over

many years.. Many of these standards are intuitive. For example, NSPE Fundamental Canon #5 states "Avoid deceptive acts". It is pretty widely accepted in all walks of life that deception is unethical.

But, other topics covered by the Codes of Conduct may not be so intuitive. For example, the NSPE Code of Ethics for Engineers prohibits the acceptance of free engineering designs from equipment suppliers for specifying their product. On the surface, this arrangement looks like it might be a "win-win situation". You get help with the engineering and the vendor gets his foot in the door. But, the free engineering design provided to you by the vendor is a form of compensation that creates a conflict of interest. Conflicts of interest will be covered at the end of this course.

Why Practice Engineering Ethics?

OK, you know that it's important to study engineering ethics to learn what is considered to be appropriate behavior for professional engineers. Once you know what the rules are, why is it important to follow them?

Setting aside the issues of right and wrong for a moment - which is incentive enough for most of us to practice ethics – there are other reasons why it is important for you to act ethically in your professional practice. Below are some of the consequences that can result from unethical behavior:

- Personal injury and damage to property due to your engineering designs, which can result in litigation against you
- Disciplinary action by your state licensing board and any professional societies with whom you are a member
- Embarrassment to you, your employer and the engineering profession
- Loss of income due to termination by your employer or being ostracized within your local engineering community as a result of your actions

It is important to note that all of the state engineering boards have enacted laws and rules for engineers. Like the professional societies, the state licensing boards' rules of professional conduct follow many components of the ECPD/ABET model, which remains the *de facto* standard across the U.S.

The Most Common Ethics Violations

Covering every state licensing board's requirements is not feasible in this short course. In fact, just covering every point in the NSPE Code of Ethics would take an entire course in itself. The focus of this course, ***Professional Ethics for Engineers***, is the most common ethics violations and what you can do to ensure that you don't find yourself on the wrong side of a Board disciplinary hearing.

A survey of recent disciplinary actions imposed by the Texas Board of Professional Engineers and the Florida Board of Professional Engineers, two of the nation's largest licensing jurisdictions, indicates that the following are the most common violations of the Boards' Laws and Rules:

- Advertising and/or practicing engineering without a license.
- Sealing plans or documents for which the engineer lacked competence in the subject matter or the engineer had no direct control or supervision of the preparation of the plan or document.
- Sealing plans or documents which indicates gross negligence or a lack of care and diligence (i.e. not conforming to applicable codes and standards)

The violations listed above, which are covered under Fundamental Canons #1 and #2 of the NSPE Code of Ethics for Engineers, are illegal in Texas and Florida, as well as all other U.S. licensing jurisdictions.

Advertising and/or Practicing Engineering without a License

If you are a professional engineer, you may think there's no way you can possibly run afoul of Rule of Practice #1e (a subset of Fundamental Canon #1) of the NSPE Code of Ethics, which states:

> *Engineers shall not aid or abet the unlawful practice of engineering by a person or firm.*

Unlicensed practice of engineering is one of the most common violations prosecuted by U.S. state engineering licensing boards. An individual who has never been licensed as an engineer (and in some cases has no engineering training whatsoever) will advertise that his company performs "Engineering Services" in the local edition of the Yellow Pages. Or an individual with an expired PE registration will continue to perform "Engineering Services" after the effective date that his PE registration expires. If you are registered as a professional engineer and your registration is current, then Rule of Practice #1e doesn't apply to you. Right?

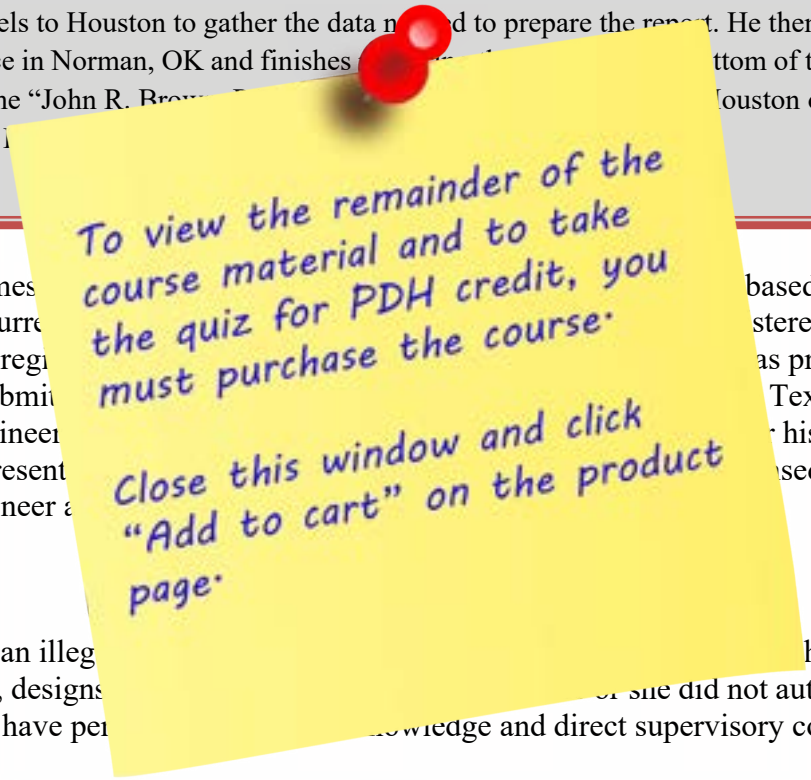
There are instances where a registered professional engineer in good standing can unintentionally violate Rule of Practice #1e of the NSPE Code of Ethics and subject himself to disciplinary action by one of the state licensing boards. Case Study #1 is one example:

Case Study #1

Mr. John Brown works for the ABC Consulting Company in their Norman, OK office. He is a registered professional engineer in his home state of Oklahoma. Mr. Brown's primary job responsibility is the preparation of environmental impact reports for the proposed construction projects initiated by the municipalities in the state of Oklahoma.

Mr. Brown receives a call from ABC's Houston, TX office. The engineer in the Houston office that is responsible for preparing environmental impact reports has just resigned. The Houston office has a contract to prepare an environmental impact report for a construction project that is planned by the Houston Independent School District (HISD).

Mr. Brown travels to Houston to gather the data n d to prepare the rep t. He then travels back to his office in Norman, OK and finishes ttom of the report, he signs his name "John R. Bro ouston office for submittal to the



Although the names based on a real-world scenario that occurre stered in another state, he was not regi as prepared. Since the report was submi Texas Board of Professional Engineer his name in the Texas report represent sed in Texas as a professional engineer a

Plan Stamping

Plan stamping is an illeg her registration seal on drawings, designs he did not author or for which he or she did not have per owledge and direct supervisory control and responsibility.

Rule of Practice #2b in the NSPE's Code of Ethics for Engineers states the following:

> *Engineers shall not affix their signatures to any plans or documents dealing with subject matter in which they lack competence, nor to any plan or document not prepared under their direction and control.*

There are two primary ways in which engineers get in trouble with Rule of Practice #2b:

1) Sealing documents for engineering work in areas for which the engineer lacks competence.
2) Sealing documents for engineering work in areas where the engineer is competent, but the engineer did not supervise the work (plan stamping).