

Summary of Ethics Case Studies and Exercises

As engineers, our work has significant impact on society and we have a responsibility to protect the public. The technical complexity of issues within our profession, coupled with rapid changes in technology, mean that the public cannot be protected through explicit laws alone, since the laws cannot always be current enough or provide sufficient detail to handle all relevant situations and still encourage responsible innovation. Development of and adherence to a professional code of ethics is therefore necessary. Enforcement of the code is accomplished through a civil court system which uses professional peers to advise juries concerning reasonable engineering practices.

In addition to responsibilities to society, an engineer also has responsibilities to her/his employer, to fellow employees (and professional peers), and to himself/herself. Ethical problems arise when situations produce conflicts between two or more of the above responsibilities. In addition to protecting the public, a code of ethics provides the engineer with guidance concerning resolution of such conflicts.

If a situation arises where the code of ethics does not provide sufficient guidance, the engineer is encouraged to discuss the issue with peers, to consult appropriate resources within her/his professional organization, and to seek resources within other relevant organizations. A list of resources within IEEE (including an ethics hotline) and other relevant organizations was provided during Class #2 and is posted on the class web page.

Key points of Ford Pinto case study:

- 1) An engineer has a responsibility to employ reasonable engineering practices concerning the safety of the products he or she develops.
- 2) As a society, we elect to take certain risks because of the possible benefits we may gain. For example, we choose to have a 70 mph speed limit on highways rather than drive at 20 mph, which would reduce the number of accidents, because the higher speed limit allows us to reach our destinations much faster. The key to society taking these risks is that the members of society give an informed consent.
- 3) Because of their technical background, engineers are more likely to grasp the possible societal and safety implications of a technology or a product than either company management or the general public. An engineer has the responsibility to inform management of possible safety hazards in products he or she is developing. If management does not respond appropriately, the engineer has a responsibility to work within his/her company to make sure that his/her concerns are known and given due consideration. The engineer may also have a responsibility to inform the public (i.e., to blow the whistle).
- 4) Engineers have ethical responsibilities concerning the public's safety which are more stringent than legal obligations.

Key points in exercise to develop a code of ethics:

- 1) The main theme of a professional code of ethics is that an engineer has professional responsibilities. These responsibilities can be divided into four groups:
 - a) Responsibilities to society
 - b) Responsibilities to an employer
 - c) Responsibilities to fellow workers
 - d) Responsibilities to self
- 2) Ethical problems arise when there are conflicts between responsibilities in two or more of the above groups.
- 3) A good code of professional ethics will enumerate the professional responsibilities discussed in item 1 and give guidelines for resolving conflicts discussed in item 2. Most professional societies (such as IEEE and NSPE) have a code of professional ethics.

- 4) When a code of ethics does not provide sufficient guidance, you can discuss issues with your peers and also make use of professional resources such as web pages and ethics hotlines.

Key points in Von Braun case study:

- 1) An engineer's work can have a very significant impact on society.
- 2) It is unethical for an engineer to develop a product (or technology) not caring about how it will be used or about its impact on society. An engineer cannot divorce himself or herself from the societal impact of his or her work. An engineer also has a responsibility not to work for the support of immoral or evil causes.
- 3) It is unethical for an engineer to exploit unfair labor conditions to develop a product or technology.
- 4) Society and history will often credit an engineer for his or her technical accomplishments without holding the engineer responsible for his or her behavior. Such "hero-making" is wrong.
- 5) Governments can behave unethically. This does not excuse unethical behavior on the part of the engineer.
- 6) Ethical mistakes can compound. You can start with a small error in judgement which will later precipitate a larger error in judgement, etc. The way to avoid the "slippery slope" is to make proper ethical judgements in the first place.