

ECE 101

HW

I. Ethics in Engineering (group discussion and individual homework)

Ethics refers to standards of conduct which are accepted by society as being morally right, such as being honest, causing no harm, and acting in the best interest of public welfare. Engineers often face ethical questions. We need to weigh potential harm or benefit to the public, our employer, our customer and our fellow workers. Sometimes the answers are not clear. Should we work on a product that could be beneficial, but could potentially be misused in a harmful way? Must we follow every regulation to the letter or are there times when it's acceptable to fudge a little, such as to preserve jobs for people who need them?

Many professional engineering societies have a code of ethics. Most are based on the Model Rules of Professional Conduct given by the NCEES (National Council of Examiners for Engineering and Surveying) – the organization that develops and administers the Professional Engineer licensing exam. These rules are included at the end of this handout.

In your group, discuss how you would deal with each (or at least some) of the six ethical dilemmas below. Try to consider the problem from a personal perspective, i.e., this is not just an abstract problem that you're advising someone else how to handle, this is your problem and you need to live with the solution.

For your individual homework, pick one of the six situations and think about it in more detail; come up with at least two possible responses and describe the arguments for and against each response. Then decide which response you would advocate, and why. Write a short paper presenting your (i) situation, (ii) options, (iii) arguments and (iv) decision. Along with your own thoughts, you should refer to the Model Rules of Professional Conduct for guidance.

1) You work for the FDA, evaluating a pharmaceutical company's new drug. The company wants to release the drug immediately, not just to make money but also because the drug shows promise to help people who are very sick right now. So far, their testing has not shown any serious side effects, but the testing is not complete. For example, the drug has only been tested on adult males, and not for long-term usage. Do you approve the drug now or wait for more testing?

2) You are the quality control engineer evaluating a product that is scheduled for release now. The product is not quite ready – it basically works and is not dangerous, but it is not perfect. For example, maybe it breaks easily or some of the advanced options don't work. If the company releases it, people will waste money on an inferior product, and the company's reputation may suffer. If the company misses the release date, the customer will cancel the contract. The company will lose money and lay off workers. Do you approve the product for release or not?

3) You are the supervisor for a team of electronics production technicians. You are supposed to follow a rigorous set of government safety regulations, but the technicians routinely ignore them. They say that the regulations are cumbersome, uncomfortable, unnecessary and inefficient. For example, they are supposed to wear safety goggles while soldering, but they say that it is hard to see clearly through the goggles, it takes them longer and they make more mistakes. The technicians are all very experienced and competent, and have never been injured on the job. Do you insist on compliance with the safety regulations, or let the technicians ignore them?

4) You are the manager of a project to produce an item for a customer. The contract is for a certain amount of money, based on a detailed analysis of what it will cost your company to produce the item. While working on the project, one of your engineers has discovered that the item can be made just as well with a less expensive material, which will cut the cost significantly. If you tell the customer, they may want to renegotiate your contract for less money. Do you tell them?

5) You are in charge of monitoring the levels of toxic chemicals your company releases into a local river. One chemical exceeds the permitted level by a very small amount, a fraction of a percent. If you report it, your company will have to introduce a very expensive procedure to treat this chemical. In these hard economic times, that expense may mean the company will have to cut jobs. Do you report it or let it slide?

6) You work for a company developing high-tech security systems, including extensive audio and visual surveillance equipment and biometric monitoring devices. You are concerned that companies can use this surveillance to spy on employees without their knowledge, violating their privacy, and that the personal data collected could be sold, stolen or otherwise misused. What is your responsibility here? Should you refuse to work on ethically questionable technologies, or is it the sole responsibility of the customer who buys the equipment?

240.15 Rules of Professional Conduct

A. Licensee's Obligation to Society

1. Licensees, in the performance of their services for clients, employers, and customers, shall be cognizant that their first and foremost responsibility is to the public welfare.
2. Licensees shall approve and seal only those design documents and surveys that conform to accepted engineering and surveying standards and safeguard the life, health, property, and welfare of the public.
3. Licensees shall notify their employer or client and such other authority as may be appropriate when their professional judgment is overruled under circumstances where the life, health, property, or welfare of the public is endangered.
4. Licensees shall be objective and truthful in professional reports, statements, or testimony. They shall include all relevant and pertinent information in such reports, statements, or testimony.
5. Licensees shall express a professional opinion publicly only when it is founded upon an adequate knowledge of the facts and a competent evaluation of the subject matter.
6. Licensees shall issue no statements, criticisms, or arguments on technical matters which are inspired or paid for by interested parties, unless they explicitly identify the interested parties on whose behalf they are speaking and reveal any interest they have in the matters.
7. Licensees shall not permit the use of their name or firm name by, nor associate in the business ventures with, any person or firm which is engaging in fraudulent or dishonest business or professional practices.
8. Licensees having knowledge of possible violations of any of these Rules of Professional Conduct shall provide the board with the information and assistance necessary to make the final determination of such violation. (*Section 150, Disciplinary Action, NCEES Model Law*)

B. Licensee's Obligation to Employer and Clients

1. Licensees shall undertake assignments only when qualified by education or experience in the specific technical fields of engineering or surveying involved.
2. Licensees shall not affix their signatures or seals to any plans or documents dealing with subject matter in which they lack competence, nor to any such plan or document not prepared under their responsible charge.
3. Licensees may accept assignments for coordination of an entire project, provided that each design segment is signed and sealed by the licensee responsible for preparation of that design segment.
4. Licensees shall not reveal facts, data, or information obtained in a professional capacity without the prior consent of the client or employer except as authorized or required by law. Licensees shall not solicit or accept gratuities, directly or indirectly, from contractors, their agents, or other parties in connection with work for employers or clients.
5. Licensees shall make full prior disclosures to their employers or clients of potential conflicts of interest or other circumstances which could influence or appear to influence their judgment or the quality of their service.
6. Licensees shall not accept compensation, financial or otherwise, from more than one party for services pertaining to the same project, unless the circumstances are fully disclosed and agreed to by all interested parties.
7. Licensees shall not solicit or accept a professional contract from a governmental body on which a principal or officer of their organization serves as a member. Conversely, licensees serving as members, advisors, or employees of a government body or department, who are the principals or employees of a private concern, shall not participate in decisions with respect to professional services offered or provided by said concern to the governmental body which they serve. (*Section 150, Disciplinary Action, NCEES Model Law*)

C. Licensee's Obligation to Other Licensees

1. Licensees shall not falsify or permit misrepresentation of their, or their associates', academic or professional qualifications. They shall not misrepresent or exaggerate their degree of responsibility in prior assignments nor the complexity of said assignments. Presentations incident to the solicitation of employment or business shall not misrepresent pertinent facts concerning employers, employees, associates, joint ventures, or past accomplishments.
2. Licensees shall not offer, give, solicit, or receive, either directly or indirectly, any commission, or gift, or other valuable consideration in order to secure work, and shall not make any political contribution with the intent to influence the award of a contract by public authority.
3. Licensees shall not attempt to injure, maliciously or falsely, directly or indirectly, the professional reputation, prospects, practice, or employment of other licensees, nor indiscriminately criticize other licensees' work. (*Section 150, Disciplinary Action, NCEES Model Law*)

(http://www.ncees.org/About_NCEES/Publications/Publications/Model_Rules.php.)