Ethics in Engineering

Lecture 2/4

Review of Topic from Lecture 1

- You are an employer at a large multinational software firm. You put an ad on Monster.com for software engineers to design a new product.
- You get a bunch of applications, but two stand out based on the applicants' previous internships and the high quality of their communication skills in the interviews.
- The first student has almost all A grades, but came from a university where several cheating scandals have been reported in the paper. The other applicant has mostly B grades, but came from a university well known for strictly enforcing integrity?
- **Who would you hire?**

This really Happens

- *Insider: UNC tolerated cheating* – Charlotte Observer Nov. 18, 2012
- *U.S. News strips George Washington University of ranking for cheating* – Nov 15, 2012
- *Cheating scandal rocks Harvard University – NECN.com* – August 31, 2012
- *An assistant registrar was accused of changing hundreds of student grades at Southern University* – 2003
- *Diablo Valley College students were accused of trading sex for grade changes* - 2007

Outline:

- Review Pentium Case
- From Codes to Cases
- Moral Considerations
- Moral Reasoning & Case Analysis

Pentium Case

Turn to your neighbor(s) and discuss the following:

- What course of action could Intel have taken to satisfy their customers and minimize the negative publicity they received?

Pentium Case

Discuss this with your neighbor(s):

In the literature that comes with a product a manufacturer places a warning such as "This product may contain unexpected flaws and might not operate correctly under all conditions."

- Does this solve the ethical problems for the company?

Clicker Question

What do you think (there is no right answer):

In the literature that comes with a product a manufacturer places a warning such as "This product may contain unexpected flaws and might not operate correctly under all conditions."

Does this solve the ethical problems for the company?

A. Yes
B. Sort of
C. No

Pentium Case

Was there really an ethical dilemma? If so what was it?

- A **dilemma** is a problem offering two possibilities, neither of which is practically acceptable

Part 1: From Codes to Cases

Going Beyond The Code

- The code of ethics for engineers gives us a good set of guides to follow.
- But knowing what the codes say and what exactly to do in a given situation is not always obvious.
- The primary reason is that really hard ethical situations require moral reasoning and conflict resolution.

Where we will begin

- To start our exploration into case analysis, we will simply begin by looking at some cases.
- Our goal is to engage in a form of moral reasoning about the cases, which involves:
  - Taking note of which codes of engineering ethics apply.
  - Identifying conflicts.
  - Making a choice of what to do.
- All of this will lead us to a discussion of moral considerations and moral reasoning.

Ethical Frameworks

Rights Approach

- Which option best respects the rights of all who have a stake?

Utilitarian Approach

- Which option will produce the most good and do the least harm?

Justice Approach

- Which option treats people as I want to be treated?

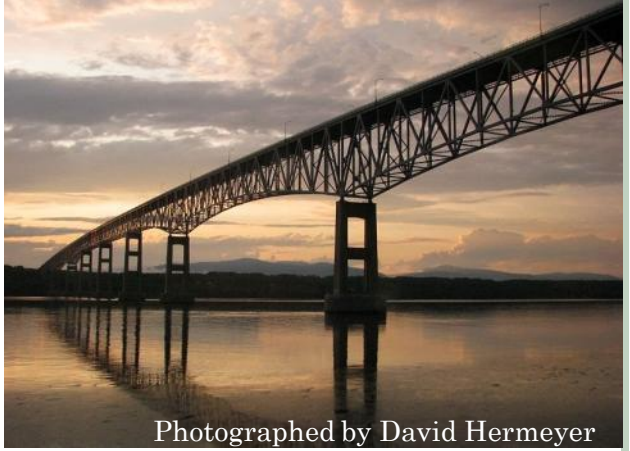
Ethic of Care Approach

- Which option is best for those most in need?

Virtue Approach

- Which option leads me to act as a responsible person?

Case 1: Protecting the safety of society


Photographed by David Hermeyer

Your employer asks you to design a bridge that will not exceed $1 million to build. After doing a study you determine the following:

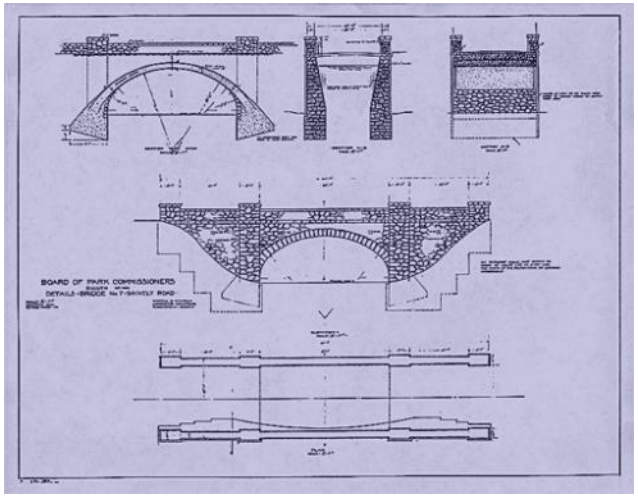
a) An ideal bridge can be built for $1.5 million.
b) Given the design constraints, a bridge built for $1 million will collapse in a moderate earthquake.
c) A bridge built for $1.25 million will survive a moderate earthquake, but will collapse in an infrequent extreme earthquake.

Case 1: Protecting the Safety of Society

Suppose your employer says, “if we don’t build the bridge for $1 million, then we are going to have to lay off half of the staff, including you.”

He further asks you to go ahead with the next stage of the project.

What do you do?



http://www.leydenscience.org/bridges/college.htm

Clicker Question

What do you think is the **primary conflict**:

A. Your duty to your fellow employees vs. your duty to your boss
B. Your duty to society vs. your loyalty to your own career
C. Uncertainty about the maximum magnitude of an earthquake vs. the need to ensure a safe structure.
D. Your duty to be honest to clients vs. your duty to complete the project

What is the conflict?

- The code of ethics for engineers requires:
  - You to take the safety of society as being of paramount importance.

- However, you also feel a personal sense of loyalty to your company and fellow co-workers. You don't want anyone to lose their job.

- **The conflict** is between your duty to society and your loyalty to your own career and the welfare of your other fellow employees.

What is more important?

- The conflict is between your future employment and the employment of others in your company, and the welfare of society.
- In a case like this the welfare of society comes first.
- We have to take into account the fact that your duty to protect the public is *greater than* your duty to your own career, and that of your fellow employees.

Case 2: Telling the Truth In Public Statements

You are asked by the government to verify that a certain nuclear reactor will not leak toxic substances into the neighboring ocean.

After doing a study you discover that:

a) The nuclear reactor likely will leak within the coming 8 years, but there is significant uncertainty.
b) The nuclear reactor cannot be evaluated more carefully unless it is shut down immediately.
c) Both the ocean and the neighboring community are at risk.

Case 2: Telling the Truth In Public Statements

Suppose that upon receiving your report, government officials ask you to modify your report so as to reflect that the nuclear facility is actually safe.

They claim that altering the report will protect the public in the area, preventing panic while the government attempts to shut down and fix the facility.

What do you do?

http://en.wikipedia.org/wiki/File:Diablo_canyon_nuclear_power_plant.jpg

What is the Conflict?

- The code of ethics requires that you
  - Safeguard the public's welfare.

  But it also requires that you

  - Tell the truth when making public statements concerning your area of engineering.

  To solve this conflict, you must
  - correctly understand what each code is telling you, and
  - choose to act on the obligation that is of priority.

What is the Conflict?

- What does **protecting the public** mean?
  - Making sure that they are safe
- What does issue **public statements in an objective and truthful manner** mean.
  - Telling the public the nuclear reactor may not be safe, but outlining the uncertainties.
- But the government is asking you to alter your report *in order to protect the public*.

What is the conflict?

- Your **obligation** is to safeguard public safety and to tell the truth in your role as an engineer. This means that you cannot alter data as an engineer, and that you must tell the truth about the nuclear reactor.

- The **government** is calling on you as a citizen to alter documents as a way to protect your fellow citizens.

- The **conflict is between** your obligations as an engineer and your obligations as a citizen.

What is more important?

- Role conflicts are hard!!!
- No easy answer!!!
- This is where thinking about other moral considerations matter.
  - What about the public's right to know?
  - What about the government's obligation to tell the truth?
- In this case your duty as an engineer to tell the truth when making public statement *trumps* your civic duty to be loyal to your government.