Responsibilities of Professional Engineers

• Loyalty
• Confidentiality
• Respect Authority
• Behave! (Use your knowledge only for good...)
  – Conflicts of Interest
  – Occupational Crimes
  – Environmental responsibility
Collegiality...

- Considered a “professional virtue”
- Four central elements (M&S):
  - Respect... for colleagues, clients
  - Commitment... to overall good
  - Connectedness... to broader picture
  - Cooperation... with the team
1. Loyalty

A very important responsibility for engineers

Martrin and Schinzinger define two types of loyalty:

Agency loyalty

Identification loyalty

Agency – loyalty

- It is owed
- Fulfill your contractual duties to employer/client
- Do your job and follow the rules
- Typically not a good match for engineering positions

Identification – loyalty

• You do your job to best of your abilities (always)
• Identify with the goals of the organization and feel you are part of the team
• More to do with emotions, attitudes, and a sense of belonging
• More common with engineering positions

Which is best?

- Depends on person and situation, but...
- Generally find that people who identify with the goals and aspirations of the company will be more likely to “look out” for its interests
- Can be counter-productive if taken too far...
Loyalty (both agency and identification) is important to the Company and to the employee for many reasons

- Productivity, moral
- Maintaining Confidentiality
- Promoting Team work
- Exploiting investment in training
- Stability in workforce

Loyalty can be misplaced
(Can you be too loyal?)

- A real “Company man”

- Sometimes ethical issues are set aside to protect the organization with possible negative consequences
  - Hide illegal actions
  - Sabotage competitors
  - Falsify records

• Preserving the safety/interests of the public and being loyal to the employer can clash and create moral conflicts.
  – For the engineer: safety of the public is paramount (ref: code of ethics...)
  – For the company: loss of jobs (loyalty to the employee), returns to investors etc. may create a conflict

“In general, there is a *moral* obligation to limit loyalty in situations where professional duties should have a higher priority (e.g. safety)”

Bottom line: Engineers owe a loyalty to their employers / clients... but there are (reasonable) limits.

2. Confidentiality (the hallmark of a professional)

• Keep confidential information confidential!

• Types of information
  – Public (available to anyone)
  – Private (restricted/conditional availability)
    • Confidential
    • Privileged
    • Proprietary
    • Trade secrets (and ~patents)
• What information should be kept private?
  – Test results and data
  – Information on (new) products
  – Designs of products
  – Business information
    • Number of persons working on a job
    • Identity of suppliers
    • Marketing strategy
    • Production costs and yields
    • Etc.
  – If in doubt, don’t let it out!
Confidential Information

• Any information that is desirable to keep secret. Usually has some exploitable value for business purposes (special processes, techniques, intellectual property etc.), or could have negative consequences if made public (competitive information, plans etc.)
Privileged information

• Available only on the basis of special privilege
  – If you are in a position of trust, you are often given this kind of information
  – Engineers often require this type of information to do their job
Proprietary information

- Information that the companies owns (as defined by the law) and *can* be legally protected (e.g. patents, copyrights)
- Usually considered an asset (has value)
Trade Secrets

• Proprietary (and other) information that the company wants to keep secret; it is not patented.

• It is protected by common law; if your secret is used by others, you can sue them or the employee that has divulged it. (re: agency loyalty; non-disclosure)

• Little recourse / protection if secret gets out (legally...)
Trade Secrets cont’d

• The “secret” can sometimes be found through “reverse engineering”.

• The ethics of reverse engineering is a major issue for all, but still legal if done “properly” (product legally obtained).
Patents

- Makes idea public, but provides legal protection against others using the ideas for a period of time
- 20 year limit in most places
- The idea or concept is open for all to see and to modify or improve upon if they wish and then file a new patent on the improvement
Patents (cont’d)

- Very expensive to file, maintain and defend.

- Some companies and entrepreneurs may not patent because of the chance of being taken to court for other patent infringements; having a patent does not mean it does not infringe on other patents!!!
Engineers have a clear responsibility to maintain confidentiality, but...

• Public safety / interest trumps secrets

• There are “reasonable” limits if you move to a new employer / client
  – Must respect previous employers need to maintain confidentiality
  – Have a right to look out for your own interests
Factors affecting use of previous knowledge:

- Length of time involved
  - Knowledge is timely; value diminishes with time

- Competition
  - More restrictive if directly competitive

- Agreements and incentives
  - Companies often offer “deals” or incentives in exchange for silence
Consultant engineers can encounter moral dilemmas because in solving one problem, they develop a concept or technology that could be applied to a competitor to make their product better or cheaper.
How companies might handle you changing jobs when confidentiality is at risk:

• Employee sign employment contracts that place constraints on future employment

• Company give positive benefits to those leaving such as special pension considerations, the opportunity to do consulting etc.

• Company works with employees to show the damage that can be done if information is passed on.
3. Respect for Authority

- Authority is the “potential and resources” to accomplish tasks
- **Power** is the capability to do so
- Authority gives the right to control decisions affecting the company’s interests
- Engineers must respect the authority of their employers
• Martin and Schinzinger define two types of authority
  – Institutional authority
    • Associated with administrative position
  – Expert Authority
    • Accrues from specialized knowledge
  – (Similarly, there is *positional* and *personal* power.)

Institutional authority

• Those with authority have the right to administer their duties and the freedom to actually achieve organizational goals by expending the resources available to them.

This type of authority usually goes with the position:
  • Managers
  • Administrators
  • Project Engineers
  • Etc.

Problems:

• Sometimes those with institutional authority do not have expert authority in some of the areas in which they are expected to make decisions.

• Consultation with those that have the expertise is very important (for engineers as well as those with institutional authority).

Morally Justified Authority

• Institutions can try to direct engineers to do things that are not "morally justified"*
  – *can be defended as, or is generally accepted as morally acceptable

• Engineers may have a institutional obligation to obey a directive which is morally unjust but a moral and professional obligation not to

• Potential source of a moral dilemma

Obliged to respect legitimate authority...

• ... but it should **not be done blindly**. (Professional *moral autonomy* means making independent moral judgements)

• Does not give right to ignore legitimate directives

• Respecting authority *comes second* when:
  – Lives are threatened
  – Financial corruption is involved
  – Grave economic loss may result

Milgram’s Experiment

• Unwitting subject ordered to shock subject (actor)
  – People generally defer to authority
  – Don’t feel responsible
  – Have a tendency to conform

  – (26/40 administered the highest, 450V, shock; none refused before 300V!)

milgram on youtube  http://www.youtube.com/watch?v=BcvSNg0HZwk
4.1 Conflict of Interest

6.2.2 Fledderrmann

• “Professional conflicts of interest are situations where professionals have an interest which, if pursued, might keep them from meeting their obligations to their employers or clients.” (M&S)

• Three types of conflict of interest (Harris, Pritchard and Rabins, 2000)
  – Actual
  – Potential
  – Apparent
Gifts and bribes

- One of the most common traps for engineers
- Is it the magnitude that counts or is it the idea?
- They can exist in the form of:
  - Small items (pens, etc)
  - Tickets to a game
  - Free game of golf
  - Supper
  - Outright bribes or kickbacks
  - Personal favours
Things to do or questions to ask:

• Check company policy
• Make all supervisors or managers know that a gift is to be received.
• Say no if in doubt
• Will acceptance be misinterpreted as a bribe? (Appearance of impropriety)
• Will acceptance cause harm to the company and your own reputation if you accept?
Actual conflict of interest

• The situation in which an actual conflict exists now.
  – Submitting a bid for a project when one is on the committee who makes the decision
Potential conflict of interest

• Those situations in which a conflict has the potential of occurring
  – Submitting a bid for a project when one is starting to have a relationship with one of the members on the committee who makes the decision
Apparent Conflict of Interest

• Submitting a bid for a project when one has a relative who is on the committee who makes the choice
  – May not be actual or potential, but may look like that to someone else
How to avoid!

- Consult all parties about the situation
- Consult company policies
- Consult the professional Engineering association
- Be completely open (declare)
- Recuse yourself when necessary
4.2 Occupational Crimes

• Illegal, but easy to do because of your position (job)
  – Industrial espionage
  – Price fixing, bid rigging
  – Safety violations
5. Environmental Responsibilities...

• Responsibility for public health and safety is now interpreted as being closely tied to a “duty of care” for the natural environment.

• More on this in future topics...
Societal Consequences
- 3-Step process

- analyze impact of technology
  – Use tools like inquiries...
- anticipating possible impacts
  – “Imaginative forecasting”
- incorporation in design

Socio-Technical Systems (STS): “a mixture of people & technology”

- Investigating: interviews, observations, scenarios
- STSs:
  - change with time
  - have a trajectory
  - influenced by social power
  - not value neutral
- Result: Social Impact Statement (SIS)