Chapter-25 Ethics

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Introduction

Engineering ethics definition

- ✓ It is the safety and welfare of the public paramount value recognized by engineers.
- ✓ It is the field of applied ethics and system of moral principles that apply to the practice of engineering.
- ✓ It is the field examines and sets the obligations by engineers to society, to their clients, and to the profession.

http://en.wikipedia.org/wiki/Engineering_ethics

Introduction

Ethic code Definition:

Codes of engineering ethics identify a specific precedence with respect to the engineer's consideration for the public, clients, employers, and the profession.

"Engineers, in the fulfillment of their professional duties, shall hold paramount the safety, health, and welfare of the public" [*National Society of Professional Engineers*]

Introduction

Ethic code Adaptation:

Formal codes of ethics are adopted by engineering societies in technical and construction practice, as well as ethical standards.

1. The codes have been incorporated to a greater or lesser degree into the regulatory laws of several jurisdictions.
2. While these statements of general principles served as a guide, engineers still require sound judgment to interpret how the code would apply to specific circumstances.

Professional societies have adopted generally uniform codes of ethics. On the other hand technical societies have generally not adopted these, but instead sometimes offer ethics education and resources to members similar to those of the professional societies.

Introduction

Ethic code Adaptation:

Also, formal credentials (Licensing) as a requirement to practice. This involves meeting some combination of educational, experience, and testing requirements.

Hence, it is required engineers to be licensed, or passed special legislation reserving title rights to organization of professional engineers.

Introduction

The principle of code and ethics:

The general principles of the codes of ethics are largely similar across the various engineering societies and chartering authorities of the world, which further extend the code and publish specific guidance.

Introduction

The principle of code and ethics:

The following is an example for engineering design

1. Preparing a contract to secure the services of a specialized software firm.
2. Reviewing a contract to determine whether a contractor who built an automated production facility should be paid.
3. Deciding whether it is legal and ethical to reverse engineer a product design.
4. Managing a design project to avoid the possibility of a product liability *suit.*
5. Protecting the intellectual property created as part of a new product development activity.
6. Deciding whether to report a colleague who is taking kickbacks from a subcontractor.

Introduction

The principle of code and ethics:

The following is an example From the American Society of Civil Engineers:

1. Engineers shall hold paramount the safety, health and welfare of the public and shall strive to comply with the principles of sustainable development in the performance of their professional duties.
2. Engineers shall perform services only in areas of their competence.
3. Engineers shall issue public statements only in an objective and truthful manner.
4. Engineers shall act in professional matters for each employer or client as faithful agents or trustees, and shall avoid conflicts of interest.
5. Engineers shall build their professional reputation on the merit of their services and shall not compete unfairly with others.
6. Engineers shall act in such a manner as to uphold and enhance the honor, integrity, and dignity of the engineering profession and shall act with zero-tolerance for bribery, fraud, and corruption.
7. Engineers shall continue their professional development throughout their careers, and shall provide opportunities for the professional development of those engineers under their supervision.

Introduction

Responsibility of Engineers

1. ***Able to recognize the merit of his profession*** in serving society, attending to the welfare, benefiting mankind and progress of the majority.
2. ***Increase his awareness of the world*** as the abode of man, the universe, and knowledge of reality to make the world fairer and happier.
3. ***Reject any harm***, thus avoiding a situation that might be hazardous or threatening to the environment, life, health, or other rights of human beings.
4. As a engineer is expected to commit himself to ***high standards of conduct***.
5. ***Carry out his work efficiently and to support the law.*** In particular, he must ensure compliance with the standards of worker protection as provided by the law.
6. ***Uphold the prestige of the profession***, to ensure its proper discharge, and to maintain a professional demeanor rooted in ability, honesty, fortitude, temperance, magnanimity, modesty, honesty, and justice; with the consciousness of individual well-being subordinate to the social good.
7. ***Must ensure the continuous improvement of his knowledge***, particularly of his profession, disseminate his knowledge, share his experience, provide opportunities for education and training of workers, provide recognition, moral and material support to the school where he studied, thus returning the benefits and opportunities he and his employer have received.

Introduction

What should be known by engineer about ethics?

1) ***Enough knowledge about the legal aspects of engineering practice*** to recognize when you need to take certain actions or to know when to seek legal counsel.
2) ***Realize that the engineering profession*** has expectations for your conduct and that a true professional recognizes responsibilities to the employer, the profession, and society, not just those to himself or herself.

The laws

The origin of laws

1. ***Case law:*** derived from agreed tradition and custom, court decision is based on study of previous courts cases .
2. ***Statutory law:*** is created by a legislative body (state, federal)- in Islam (sharia)

Law contribution by:

1. ***Constitutional law:*** is the constitution which define government power (produced by constitutional bodies) – in Islam (Qur'an and Alsona)
2. ***Municipal law:*** a subdivision of statutory law (produced by cities and town) - (traffic laws, zoning) to be handled by the same agency and dispute resolved through regular court.
3. ***Administrative law:*** ruling and regulation law by an agency (OSHA) to be handled by the same agency and dispute resolved through regular court.

The Contract

Definition

- Contract is promise by a person to another to do or not to do something.
- ***Contract*** = [***offer*** (the promise to do something to create an agreement – must be clear, definite and specific) ***+ acceptance*** (make contract legally binding) ***+ consideration*** (agreement of exchange promises – provide enforceable by law)

Type of contracts:

- An express contract;
- An implied contract;
- A bilateral contract;
- A unilateral contract;

Contract output

Discharge: when contract agreement is performed to the satisfaction or at agreeing to end the contract between parties due to circumstance out of control

Breach of contract: when one party fails to perform his part of contract. General or compensatory damages are awarded.

Liability

Liability

1. ***Breach of contract:*** refers to violating a contract promise.
2. ***Committing a trot:*** is civil wrong that involve committed damage.
   a. ***Fraud:*** is intentional deceitful aimed depriving another party of his right and causing injury.
   b. ***Negligence:*** is failing to exercise proper care and provide professional standard resulting in damage or injury.

Trot Law

Deals with civil cases for penalty usually is monetary compensation rather than confinement.

Types of trot (4 types)

1. ***Misrepresentation:*** false statement
2. ***Nuisance:*** annoyance and disturbance
3. ***Negligence:*** failing to exercise correctly
4. ***Product liability:*** recovering damage from a manufacturer or seller of a product when defective product or design caused injury.

Product Liability

Product Liability law

Implied warranty: this is established for liability deal with fitness of product for their intended proposes and uses.

Strict product liability: previously manufacturer or sellers were liable when proven negligent in what they made or how they made it, and under strict liability the manufacturer may held liable for product causes injury due to customer misused or outright abused it, even the product is well designed and manufactured.

Product Liability

The Basic societal goals of product Liability

Loss spreading: shift accidental loss from victims to other parties

Punishment: punch who responsible causing loss includes design defects (reach to designer not only manufacturer) may reach as criminal act (assessment of punitive damages for malicious or willful acts).

Deterrence: to prevent similar accidents from happening in the future, to produce safer product.

Symbolic reaffirmation: it acts as a kind of that society values human safety and quality in products.

Protecting Intellectual Property

This is protected by

Utility patent: protect the function features of the design

Design patent: covers the ornamental aspects of a product such as a shape, configuration, or surface decoration. (Expensive because one claim at time)

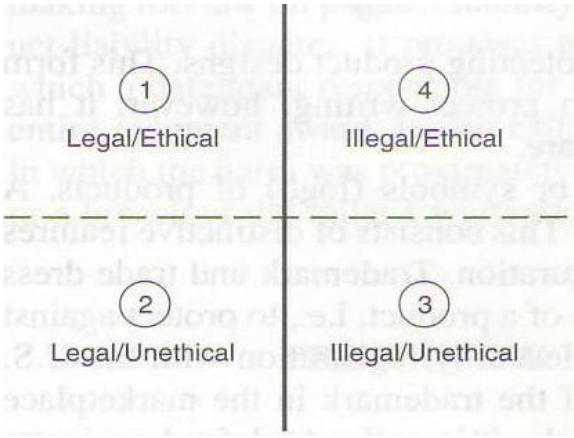
Copyright: limited usefulness in protecting designs (protecting software)

Trademarks: protect the names or symbols (logo) of products.

Trade dress: protect distinctive features of product (color, texture, size, or configuration)

Trade secret: company prefer to forgo legal protection act keeping the secrecy of the product design and feature.

The legal and ethical Domains



Code of Ethics

Standard rational to be done

- *Respect* the rights of others.
- Show *fairness* in your dealings with others.
- Be *honest* in all actions.
- *Keep promises* and contracts.
- Consider the *welfare* of others.
- Show *compassion* to others.

Note that each of these standards is based on the italicized values.

Code of Ethics

Values of professional ethics

- *Honesty* and *truth*
- *Honor*—showing respect, *integrity*, and *reputation* for achievement
- *Knowledge*—gained through education and experience
- *Efficiency*—producing effectively with minimum of unnecessary effort
- *Diligence*—persistent effort
- *Loyalty*—allegiance to employer's goals
- *Confidentiality*—dependable in safeguarding information
- Protecting *public safety* and *health*

Code of Ethics

AMERICAN SOCIETY of MECHANICAL ENGINEERS

Founded 1880

CODE OF ETHICS OF ENGINEERS

THE FUNDAMENTAL PRINCIPLES

Engineers uphold and advance the integrity, honor, and dignity of the Engineering profession by:

I. using their knowledge and skill for the enhancement of human welfare;

II. being honest and impartial, and serving with fidelity the public, their employers and clients, and

III. striving to increase the competence and prestige of the engineering profession.

THE FUNDAMENTAL CANONS

1. Engineers shall hold paramount the safety, health and welfare of the public in the performance of their professional duties.
2. Engineers shall perform services only in the areas of their competence.
3. Engineers shall continue their professional development throughout their careers and shall provide opportunities for the professional and ethical development of those engineers under their supervision.
4. Engineers shall act in professional matters for each employer or client as faithful agents or trustees, and shall avoid conflicts of interest or the appearance of conflicts of interest.
5. Engineers shall build their professional reputation on the merit of their services and shall not compete unfairly with others.
6. Engineers shall associate only with reputable persons or organizations.
7. Engineers shall issue public statements only in an objective and truthful manner.

Code of Ethics

Extreme ethical behavior

Altruism: is a form of a moral behavior in which individuals act for the sake of other people's interest. (Golden rule: Do unto others as you would have others do unto you)

Egoism: is a form of a moral behavior in which individuals act for their own advantages

Solving Ethical Conflicts

Procedure for Solving Ethical Conflicts*

I. Internal appeal option
  A. Individual preparation
    1. Maintain a record of the event and details
    2. Examine the company's internal appeals process
    3. Be familiar with the state and federal laws that could protect you
    4. Identify alternative courses of action
    5. Decide on the outcome that you want the appeal to accomplish
  B. Communicate with your immediate supervisor
    1. Initiate informal discussion
    2. Make a formal written appeal
    3. Indicate that you intend to begin the company's internal process of appeal
  C. Initiate appeal through the internal chain of command
    1. Maintain formal contacts as to where the appeal stands
    2. Formally inform the company that you intend to pursue an external solution
II. External appeal option
  A. Individual actions
    1. Engage legal counsel
    2. Contact your professional society
  B. Contact with your client (if applicable)
  C. Contact the media

Problem (2)

A computer company agreed by fax on Saturday to buy power supplies for 100,000SR from a vendor. On the following Wednesday, the purchasing manager of the computer company calls the vendor saying that he is cancelling the order. The vendor says the power supplies have already been shipped and money should be paid.

1. What is the legal responsibility of the computer company.
2. Would it have any different if the power supplies not already were shipped.

Answer

1. **the fax is considered aspart of the contract bindig the computer company and it is legaly responsible to pay the money.**
2. **In this situation, the computer company is still responsible however it can negotiate the amount of compensation to be paid for the amount of damage done.**

Problem (10)

Suppose you are a design engineer for a large multi-plant firm producing plastic parts. As part of your employment, you are required to sign a secrecy agreement that prohibits divulging information that the firm considers proprietary.

The firm has modified a standard piece of equipment that greatly increases the efficiency in cooling viscous plastic slurries. The firm decides not to patent the development but instead to keep it as a trade secret. As part of your regular job assignment, you work with this proprietary equipment and become thoroughly familiar with enhanced capabilities.

Five year later you leave the firm and go to work for candy firm as chief of production. Your new employer is not in any way in competition with the previous firm. You quickly that the previous firm's trade secret can be applied with great profit to a completely different machine used for cooling fudge. You order the change to be made. ***Discuss the ethics.***

Answer

This is intellectual property ethic and fall in trade secret act even if it is used for different application