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Social responsibility of engineers

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Abstract
Social responsibility of Engineering profession is commitment to place public safety and interest ahead of all considerations. It means that engineer takes into account and show due regard for the consequences of their conduct for wellbeing of others as well as the impact of their work on society. This requires the engineer to make determined efforts to discover all the relevant facts concerning the design, development, deployment and all possible outcomes that may affect society positively or negatively.

Keywords: responsibility, safety, society, engineering, ethics

Introduction
Engineering education has made significant progress in strengthening the basic sciences in engineering, including mathematics, chemistry, and physics. Recent trends toward increasing discussion of professionalism in the classroom notwithstanding, topics of professional responsibility (as compared to engineering sciences, and engineering analysis) have received surprisingly little attention in engineering education over the last several decades. In the practice of engineering, professional responsibility should emphasized on topics such as Safety and welfare of the society, professional ethics, environmental responsibilities.

What is the role of engineer in society?
Engineering is by all means a great profession. It is fascinating watching a figment of the imagination arise with the help of science moving towards a plan on paper. Then it is moving towards realization in stone or metal or even energy. Then it contributes to the standards of living in addition to the comfort of life. It is the engineer's extreme privilege. - Herbert Hoover
The engineer is the major figure within the material progress of the world. Engineering is what makes the reality of the potential value of science in order to translate scientific knowledge into tools, energy, resources as well as labor brought into the service of man. In order to make this kind of contribution, it requires imagination to visualize the needs of society and to appreciate the technological as well as the broad social understanding to bring the engineer's vision to reality. All in all, the broad definition focuses on the following key words: material progress of the world, societal needs and social understanding.
Engineering applies science to the common aim of life. The major purpose of the engineer is to develop both knowledge and understanding of our universe. The main focus of the engineering is to apply scientific knowledge in order to meet the needs of society. The 21st century is defined by huge challenges that humanity is facing. These are energy as well as food security in addition to scarcity of natural resources as well as climate change. The demand of engineering skill is increasingly higher than ever in order to provide sustainable engineering systems.

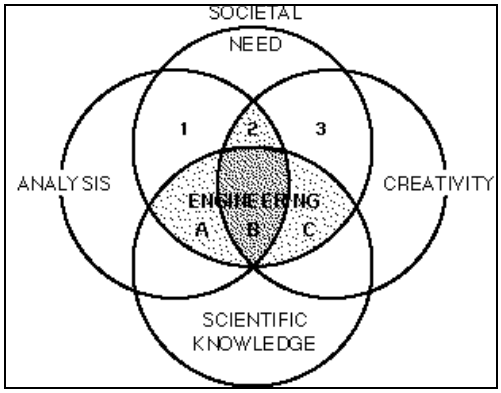

Fig 1

In above vein diagram we can observe that on the basis of analysis of social needs engineer has to apply his scientific and technical knowledge and creativity.

What is Social Responsibility?
Engineering is not stationary profession. 21st century will be defined by huge challenges now facing humanity. These are energy and food security, competition, scarcity of natural resources and climate change. The demand of engineering skills is likely to be higher than ever before in order to deliver sustainable engineering system, low carbon energy technologies and robust physical infrastructure to protect against geophysical hazards such as sea level rise, extreme meteorological events. If ranking these engineering criteria is given as an exercise to client and engineer then it will be as

Client	Engineer
1. Safety	Safety
2. Economics	Reliability
3. Reliability	Security
4. Security	Economics

As per the code of ethics of IEEE, the members of IEEE commits themselves to highest ethical and professional conduct and agree

1. To accept responsibility in making decisions consistent with safety health and welfare of public and to disclose promptly factors that might endanger the public or environment.
2. To improves the understanding of technology and it's appropriate applications and potential consequences

As for social responsibility, it means a certain commitment of the engineering profession to place both public safety and interest ahead of other considerations. The social responsibilities of engineering are the following:

- Ensuring both the safety and well-being of the public;
- Ensuring that the funds and resources of society related to technology are properly used;
- Individual and organizational concern of the impact of engineers' projects upon society;
- Commitment of engineering schools to educate future engineers on their social responsibilities;
- Commitment of engineers in order to both design and develop sustainable technologies;
- Providing expert pieces of advice to non-experts;

Providing care as well as concern about the impact of technology on both nature and environment

Creating awareness

Engineers need to develop broad fundamental understanding of their professional responsibilities. In at least one engineering college, students have developed their own codes of conduct (how they will relate to one another and the college) for their academic career (36). This experience gives the students a personal involvement with professional codes of conduct necessary in the engineering profession. These students have an opportunity to integrate their "professional code" into their daily work as engineering students. This allows students to internalize their professional responsibilities and to develop a fundamental understanding of their obligations and resulting consequences. Students at other universities and the engineering profession would be well served to learn from the experiences of these students who developed their own code.

We suggest that engineers examine and adopt "best practices" in development of rules of professional conduct which encourage engineers to understand and internalize their professional codes. Engineers need to develop broad fundamental understanding of their professional responsibilities. In at least one engineering college, students have developed their own codes of conduct (how they will relate to one another and the college) for their academic career (36). This experience gives the students a personal involvement with professional codes of conduct necessary in the engineering profession. These students have an opportunity to integrate their "professional code" into their daily work as engineering students. This allows students to internalize their professional responsibilities and to develop a fundamental understanding of their obligations and resulting consequences. Students at other universities and the engineering profession would be well served to learn from the experiences of these students who developed their own code.

This can be done by developing codes for conduct at company, division, or departmental levels in traditional engineering environments

The healthy debate among engineers (as well as clients and employers) which should naturally arise in the integration and the application of the methodologies will serve to underscore the nature and importance of the role that the engineer has in society (health, safety, and welfare of the public); the role the client has in engineering design (realistic requirements, economics, reliability, maintainability, and other associated topics of quality); the effects of engineering activity on society; and the relationship of society to engineering activities.

Conclusion

Engineers have responsibility to think about interaction between technology and society. Engineers are supposed to think about effects of their own actions and creations especially if they affect society.

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