

Obligations of Engineers towards Society

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Abstract: *Obligation is the binding power of a promise, contract, oath or vow, which means legal or moral duty. Individuals from all walks of life have their own share of obligations towards society, and engineers are not an exception in this respect. Social responsibility of engineers is to make determined efforts to discover all the relevant facts of concerned design, development and consumption and the possible outcomes of the choices available that may positively and negatively affect society. In addition to general obligations that everyone shares, professionals have duties of their professional work and responsibilities towards their clients, employers, other professionals, and society. Engineers should focus on their work to peer review, and experienced engineers should guide junior engineers. In their relationships with employers, engineers should retain trade secrecy and other proprietary information, and engineers should avoid conflicts of interests. This paper highlights the social responsibility of engineers of various branches such as civil, mechanical, electrical, chemical etc.*

Key words: *Obligation, engineers, responsibility, society, values.*

1. INTRODUCTION:

Obligation can be defined as any act by which a person becomes bound to do something to or for another, or to forbear something; external duties imposed by law, promise, or contract, by the relations of society, or by courtesy, kindness, etc. Professionals have special obligations as they have specialized knowledge and skills, and they are authorized by the people to utilize their abilities and powers wisely for the profit of their clients. Engineering ethics is derived from remarkable power of modern technology. The subject matter of engineering ethics can neither consist of procedures or concrete values that are applied mechanically in problematic situations nor the inculcation into a certain set of beliefs. Engineers understand professional values primarily at the level of individuals and organizations, as specified in the codes of ethics of all engineering organizations.

Social responsibilities of engineers are essential as it increases the skill of moral judgment and it generates better skills at responding to and solving moral problems. It also promotes the knowledge and development of professional virtues in order to produce excellent engineers that are committed to, and contribute to social progress and social justice. These responsibilities are applicable to the engineers of all branches. Engineers should be aware of the ways in which technology interacts with the large society and its citizens especially as this interaction involves values.

2. Social Obligations of Engineers of Various Branches:

In every stream engineers are abide by social responsibilities. Pertaining to their branches they have their moral responsibility towards society.

Mechanical Engineering: Mechanical engineers deal with mechanics of machines, their social obligations comprises proper testing of machines before they are put in the market for sales. A well designed catalogue which provides information regarding the working of the machinery should be provided to the customer so that there is no need of demonstration. Apart from the above engineers should be technically competent and should utilize their intelligence in innovations.

Civil Engineering: Civil engineers need to think about the part they play in society. They are the planners, designers, and builders of our nation's structures and infrastructures. They play direct role in the determination of project financing and it is their technical support that makes a project. Many civil engineers say it is not their job to supervise the reliability of a project. But civil engineers need to return to that earlier state where as individuals they played a major part in shaping society.

Civil engineers are basically the architectures' of our country. They should be law-abiding while quoting the prices of various commodities. The quality of materials used by them should be good. The civil engineers should be fair in their dealings with the labourers. They should complete their task within the allotted time span. The buildings and bridges should be designed by them in such a way that they are earthquake resistant. The construction should not be at the cost of environmental degradation. They need to make sure that they are willing to exercise both their technical and social skills. Above all, they must see that the projects that they build have solid foundations both figuratively and

practically. But the fact is there are few tools available to help civil engineers identify all of the social issues and then assist in delivering high quality solutions to them.

Chemical Engineering: The chemical engineer is an invaluable link between scientific principles and manufacturing realities. It involves the use of chemical, physical, and engineering principles. The scientist in a laboratory does basic research to develop new compounds and processes. When the scientist discovers a product that may be useful, the chemical engineer takes over. A chemical engineer should report laboratory data honestly, and they should affix their signatures only to plans that they have prepared or supervised. Thus, the engineer is the link between the laboratory and commercial production.

Environmental Engineering: The application of science and engineering principles to improve the natural environment, to provide healthy water, air, and land for human habitation and for other organisms, and to remediate polluted sites is known as environmental engineering. It includes environmental sustainability, waste water management and air pollution control, recycling, waste disposal, radiation protection, industrial hygiene, and public health issues.

Environmental engineers carry out hazardous-waste management studies to assess the implication of such hazards, advice on treatment and containment, and develop guidelines to prevent calamity. Environmental engineers also design municipal water supply and industrial wastewater treatment systems as well as address local and worldwide environmental issues such as the effects of acid rain, global warming, ozone depletion, water pollution and air pollution from automobile exhausts and industrial sources. Thus, the social responsibility of environmental engineers is to protect public health, safeguard and defend the environment.

Computer Engineering: Computer has become a part and parcel of our lives. Computer engineers therefore have a major role to play in society. As a computer engineer one should have sound knowledge of hardware and software. They should take care in maintaining secrecy and make sure that information is not hacked and password is not cracked. Their social obligation is to be updated about the new anti-virus coming in the market. They should create awareness about uses and misuses of the social networking sights. People should be enlightened about fake mails and the measures to get rid of such mails by them. They must train the rural population to ethically use the computers. Apart from the above responsibilities computer engineers should not design games which mislead the youth.

Aeronautical Engineering: The duty of an aeronautical engineer is to design, construct and tests safer the aircraft, missiles, spacecraft, satellites. They must check the performance of an aircraft in terms of stability and control. They should improve the aerodynamics of moving aircraft through design and testing, ensuring the craft flies smoother and faster.

3. Engineers as Social Activists:

In the context of social responsibility of engineers, in this paper I would like to quote few renowned personalities of India who are engineers as well as performing their social obligations.

Mokshagundam Visvesvaraya is known as the father of engineering. Visvesvaraya made an arguably remarkable contribution as Diwan to the all-round development of the state. Many industries and public works owe their setting up or active promotion to him. He was exceptional in the founding of the Government Engineering College at Bangalore in 1917, one of the first engineering institutes in India. His contributions to the national development in the field of economics, industry, irrigation, agriculture and education etc. are unmatched. Everything about him was spick and span and regular.

Despite mechanical engineer **Arvind Kumar Kejriwal**, is an Indian social activist fighting for greater transparency in Government. He was awarded Ramon Magsaysay Award for Emergent Leadership in 2006, for activating India's Right to Information movement to make powerful the poorest citizens to fight corruption by holding the government answerable to the people. As a member of India Against Corruption (IAC) Kejriwal is an active participant in the movement for the endorsement of Jan Lokpal Bill. He is considered a key figure along with social activist Anna Hazare.

Esha Shah is an environmental engineer turned social activist and scientist whose work involves anthropology and history of science and technology with special reference to agricultural development in India and risk and vulnerability of emerging, new technologies in developing societies. Her doctoral work looked at change and history of traditional irrigation technology in relation to agrarian transformation in south India. Her recent research activities include technological paradigm and spread of genetically modified **BT** cotton technology in India. Farmers' suicides and technological susceptibility, politics and science and technology studies in India, risk discourses and new emerging

technologies in India, and history of green revolution technology are also included in her work. Her other research interests include community-led natural resource management and politics of development.

Mrs. Sudha Murty, an electrical engineer and wife of Narayana Murthy, has been contributing to the society very actively through Infosys Foundation. She has initiated a move whereby all Govt. schools in the state of Karnataka have a computer and a library. She has been contributing for all the foundations work especially in donating hitech surgical equipment to many hospital works in Karnataka and other States. She has facilitated in building veterinary hospitals in the rural and backward areas. Apart from this, every year she has been donating a large amount towards the educational assistance to the brilliant but poor students.

Chetan Bhagat an iitian, is now instrumental in writing. He has written four books, all of which are bestsellers. His first three novels were written during his tenure as an investment banker. Blockbuster movie Three Idiots is based on his famous novel Three Mistakes of My Life. Thus as a writer he is contributing towards society as in his novel Three Mistakes of My Life he has preached the upcoming engineers to concentrate on the practical application of technology rather than the theoretical.

4. CONCLUSION:

In a nut shell we can conclude that engineers should be devoted to an equitable society taking up social causes in healthcare, education, art and culture, rural rehabilitation and inclusive growth. They should be responsible consumers of energy and natural resources. Thus engineers, in the fulfillment of their professional duties, shall hold paramount the safety, health, and welfare of the public. This includes raising the awareness of the engineering profession to the consequences of its activities and explaining and discussing the implication of developments in engineering and engineering works to the public. At last we can say in these days of greater liability, the professional can no longer hide behind a mask of "professionalism".

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