Ethics in Engineering Practice
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Lecture – 05
Professional Practice in Engineering (Contd.)

Welcome back. In the previous lecture we have discussed about the different types of ethical dilemma like there could be dilemma regarding what is right and what is wrong, and the other is which is better and the like both are right may be the solution, but one is better than the other. So, which is better and which is worse and we have also discussed about the eight codes of ethics let us again recapitulate what these eight codes of ethics are.

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So, it is serving and protecting the public, providing guidance, offering inspiration, establishing shared standards, supporting responsible professionals, contributing to education, deterring wrongdoing and strengthening a professions image. We will elaborate each of these in the present discussion.

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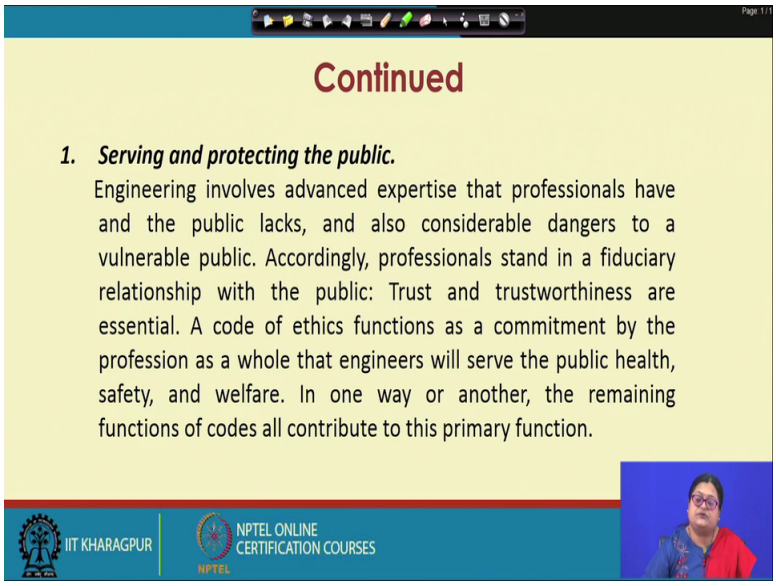

So, serving and protecting the public, engineering involves advanced expertise that professionals have and the public lacks and also considerable dangers to a vulnerable public. Accordingly professionals stand in a fiduciary relationship with the public, trust and trustworthiness are essential. A code of ethics functions as a commitment by a profession as a whole that engineers will serve the public health safety and welfare in 1 way or another the remaining functions of codes all contribute to this primary function.

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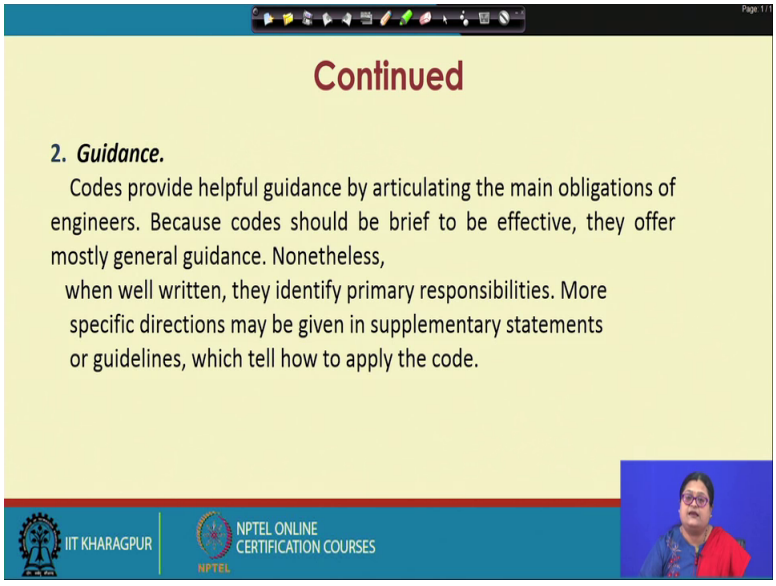

Second we talk of guidance codes provide helpful guidance by articulating the main obligations of engineers because, codes should be brief to be effective they offered mostly general guidance. Nonetheless, when well written they identify primary responsibilities more specific directions may be given in supplementary statements or guidelines which tell how to apply the code.

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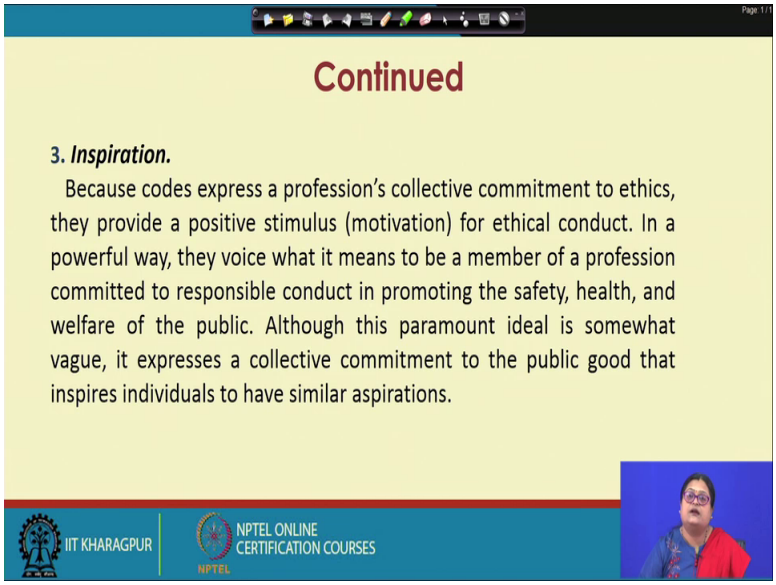

Inspiration because, codes express a professions collective commitment to ethics they provide inspiration because, codes express a professions collective commitment to ethics they provide a positive stimulus motivation for ethical conduct. In a powerful way, they voice what it means to be a member of profession committed to a responsible conduct in promoting the safety health and welfare of the public.

Although this paramount ideal is somewhat vague it expresses a collective commitment to the public good that inspires individuals to have similar aspirations. So, what we understand from here like the it provides a stimulation for ethical conduct, it gives an inspiration for the professionals in a particular profession to specially in engineering to promote the safety health and welfare of the public. But though it is vague to some extent, but it gives a general inspiration for the people to have who will be joining this profession to have similar aspirations.

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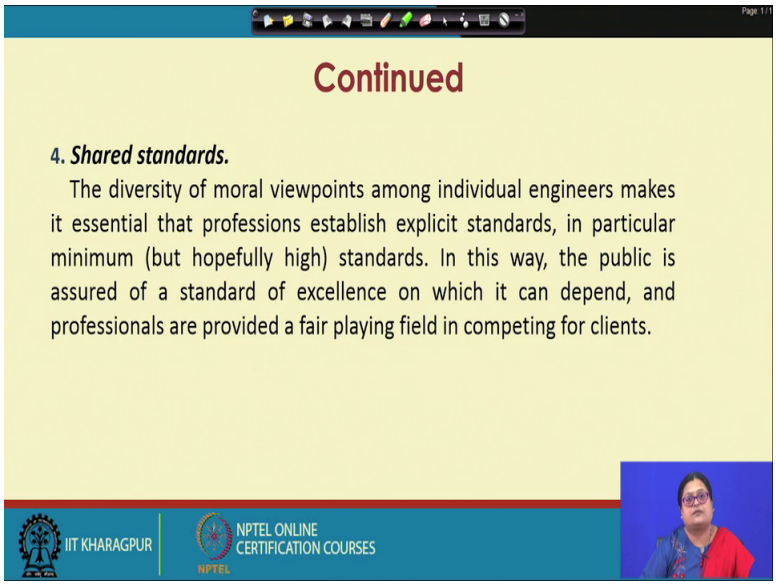

Shared standards; the diversity of moral viewpoints among individual engineers makes it essential that professions establish explicit standards, in particular minimum. But hopefully high standards, in this way the public is assured of a standard of excellence on which it can depend and professionals are provided a fair playing field in competing for clients.

So, what happens though as individuals, engineers may have a different particular standards in their life. So, different moral viewpoints, but if a shared standard is given and guideline is explicitly given, so though maybe not too many different must be done kind of things; but even if minimum, but hopefully high standards are set. So, this will ensure in the minds of the public of a standards of high excellence on which it can depend and our professionals are also provided a fair playing field to in competing for their clients, within that boundary that is given to them.

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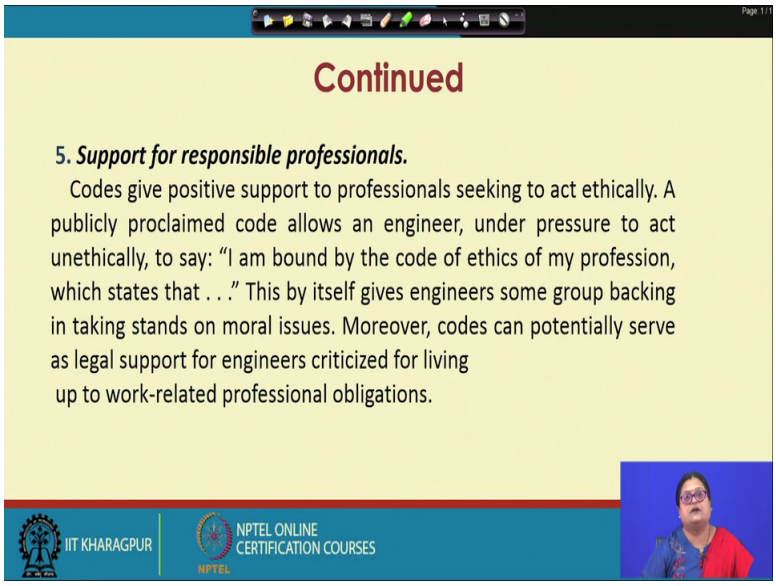

Support for responsible professionals; codes give positive support to professionals seeking to act ethically, a public proclaimed code allows an engineer and a pressure to act unethically to say I am bound by the code of ethics of my profession. Which states that so this gives them a support to responsible professionals in the sense, if they find that something is wrong if there is an ethical dilemma and they have to take a judgment and they all they have to like show discussion they can always tell a bound by the code of ethics of my profession which states that.

This by itself it gives engineers some group backing in taking stands on moral issues, moreover codes can potentially serve as legal support for engineers criticized for living up to work related professional obligations. So, sometimes what happen some engineers get criticized like being too much ethical or too like following too much of work related obligations, so these codes of ethics gives a legal support for the engineers.

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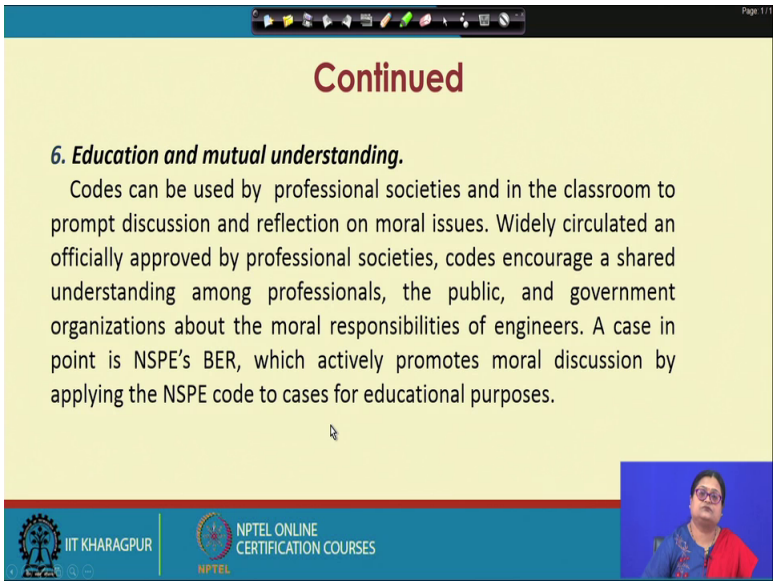

Education and mutual understanding: codes can be used by professional societies and in the classroom to prompt discussion and reflection on moral issues widely circulated and officially approved by professional societies codes encourage a shared understanding amongst professionals, the public, the government organization about the moral responsibilities of engineers. A case in point is NSPEs BER which actively promotes moral discussion by applying the NSPE code of ethics to cases for educational purposes.

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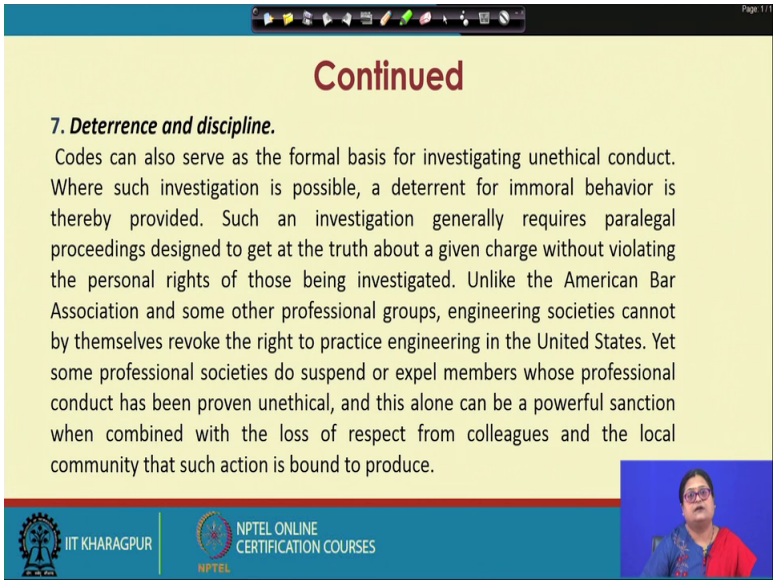

Deterrence and discipline: codes can also serve as the formal basis for investigating unethical conduct, where a such investigation is possible a deterrent for moral immoral behavior is thereby provided. Such an investigation generally requires paralegal proceedings designed to get the truth for a given charge without violating the personal rights of those being investigated.

Unlike the American bar association or other professional groups engineering societies cannot by themselves revoke the right to practice engineering in the United States. Yet some professional societies do suspend or expel members whose professional conduct has been proven unethical and this alone can be a powerful sanction when combined with the loss of respect from colleagues and the local community that such action is bound to produce.

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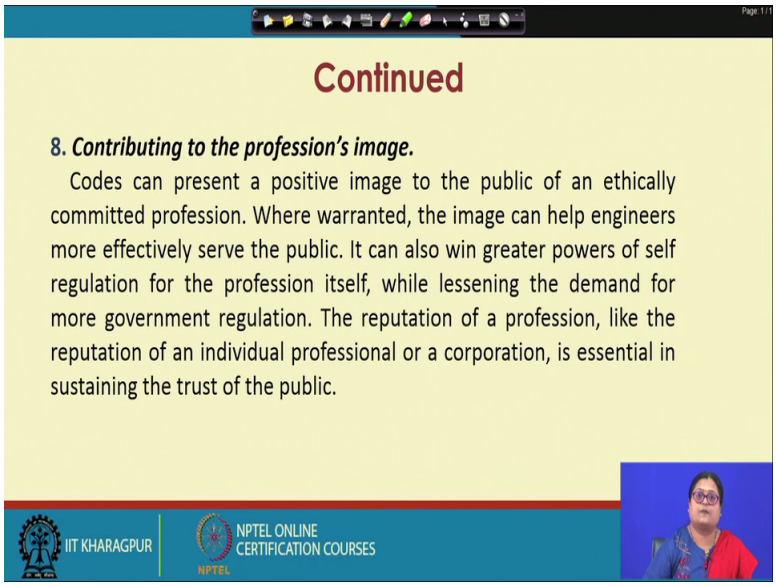

Contribution to the professions image, codes can present a positive image to the public of an ethically committed profession when warranted the image can help engineers more effectively serve the public. It can also be in greater powers of self regulation for the profession itself while lessening the demand for a more government regulation. The reputation of a profession like the reputation of an individual professional or cooperation is essential in sustaining the trust of public.

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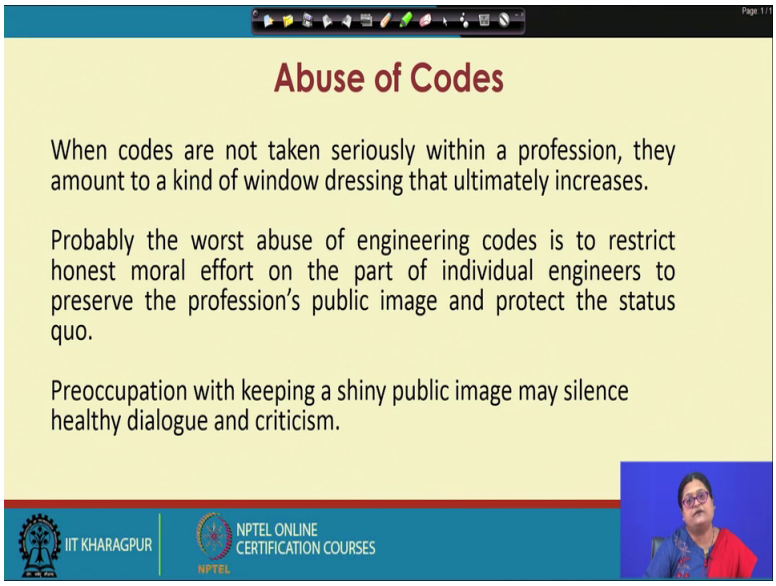

So, now we will focus into some of the abuse of codes, when codes are not taken seriously within a profession they amount to a kind of window dressing that ultimately increases. Probably the worst abuse of engineering codes is to restrict honest moral effort on the part of engineers to preserve the professions public image and protect the status quo. Preoccupation with keeping a shiny public image may silence healthy dialogue and criticism.

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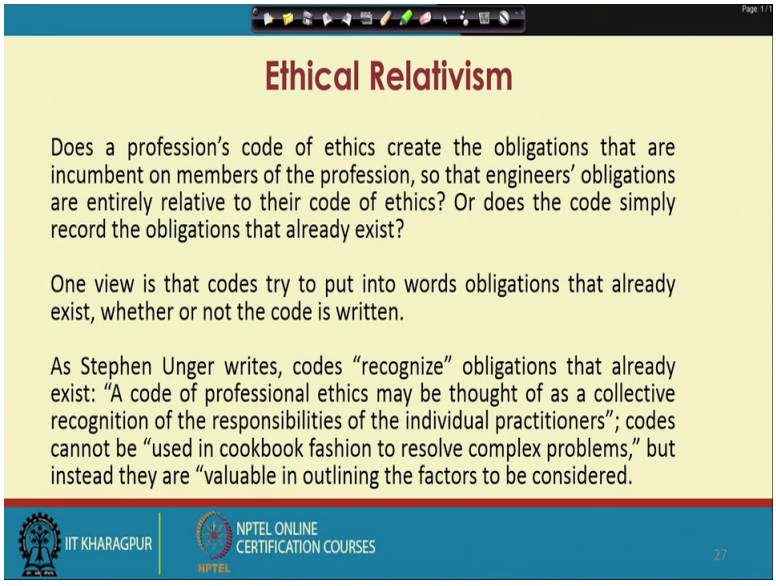

Now, we will discuss what we understand by ethical relativism, does the professional's code of ethics create the obligation that are incumbent on members of the profession. So, that engineer's obligation are entirely relative to their code of ethics or does the code simply record the obligations that already exist. So, this is a critical question which the which is a field of ethical relativism and we will try to address it, one view is that codes try to put into words obligations that already exist whether or not the code is written.

So, it may not be explicitly written something which is already followed and the codes of ethics tries to make it explicit by writing it down as Stephen Unger writes codes recognize obligations that already exist. A code of professional ethics may be thought of as a collective recognition of the responsibilities of the individual's practitioner's, codes cannot be used in a cookbook fashion to resolve complex problems but, instead they are valuable in outlining the factors to be considered.

So, according to the writer codes are recognize the obligations which are already there exist and it is a recognition of the collective responsibilities of the individual practitioners, but it cannot be used as a always a reference point to refer to complex problem and what is written in the code I will be following that only. But, it can be using used as a guideline to be followed in outlining the valuable factors to be considered.

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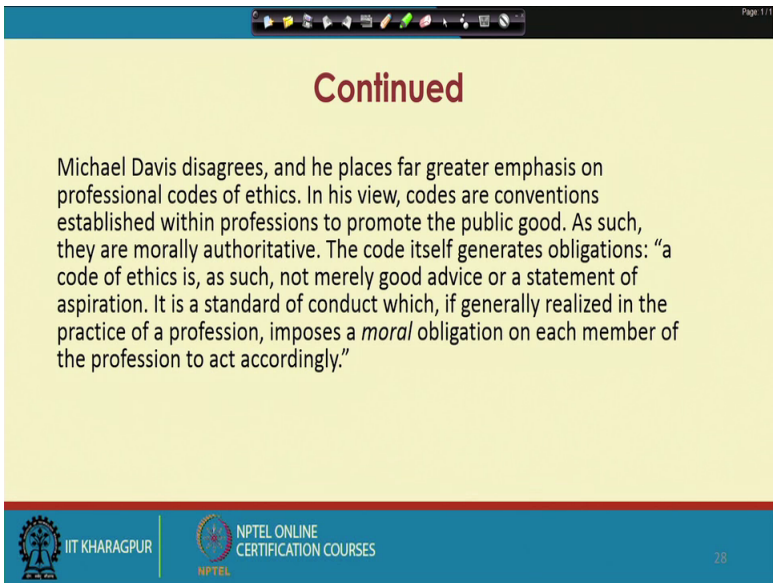

However Michael Davis he disagrees and he places far greater emphasis and professional codes of ethics. In his views codes are conventions established within professions to

promote the public good. As such, they are morally authoritative, the code itself generates obligations a code of ethics is such not merely good advice or a statement of a aspiration. It is a standard of conduct which is generally realized in the practice of a profession imposes a moral obligation and each of the members of the profession to act accordingly.

So, according to this author codes are themselves overriding principles which tells you which are your moral obligations which you must follow and if you want to be recognized as a member of a particular profession and you have to act accordingly it is not just a collection of whatever obligation is there which is existing which you may refer to when you feel like referring to it. But it is one of the must of the things to be followed and it is your moral obligation to follow this codes if you want to be a member of this particular profession.

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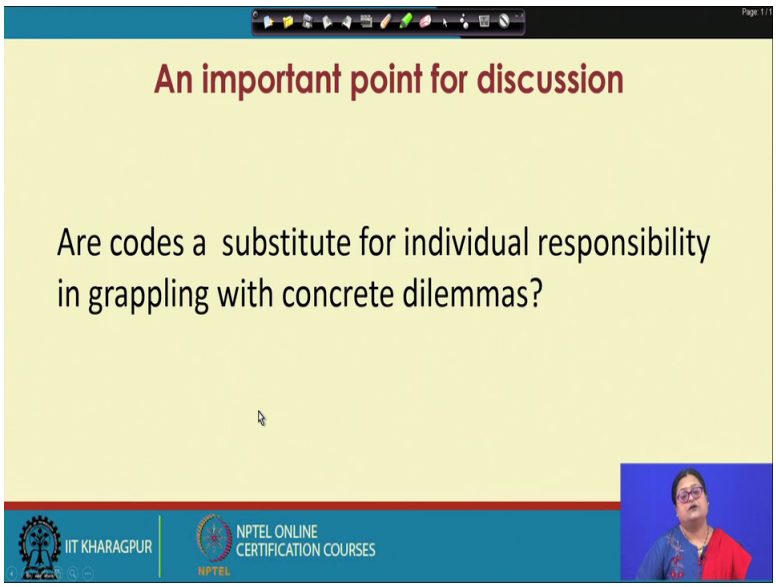

So, here we may come to an important point of discussion, regarding are codes a substitute for individual responsibility in grappling with concrete in dilemmas, because what happens if we are facing a point of dilemma. So, can you just tell like it is there in the code so I am doing it in this way or it is not there in the code therefore, I am doing in this way or we should realize our part of individual responsibility also..

Even if whether it is written in the code or not written in the code because, we understand our professional responsibilities which already we have covered in the

previous discussions and our workplace responsibilities as a employees and individual responsibilities also. So, we should be answering to the moral dilemmas by following the ethical route and deterred from doing something which is unethical in nature.

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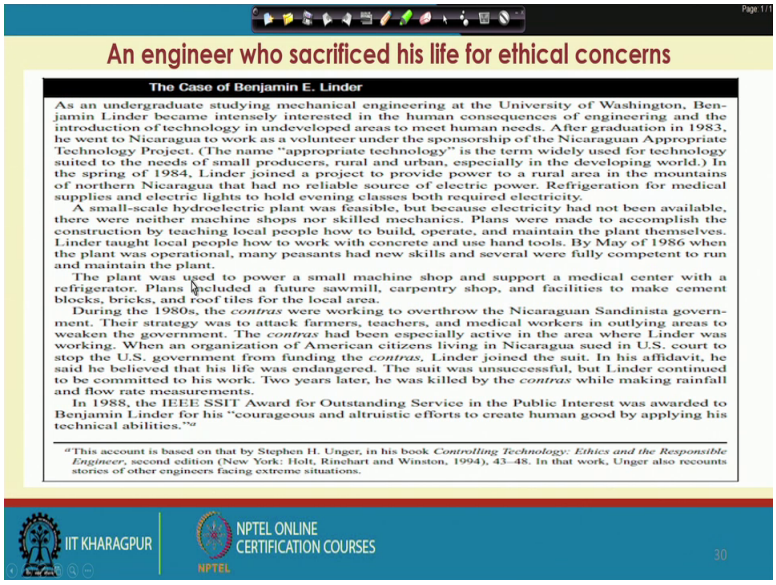

So, let us focus into this case which is the case of Benjamin Linder, as an undergraduate studying mechanical engineering at the University of a Washington Benjamin Linder became intensely interested in the human consequences of engineering and the introduction of technology in undeveloped areas to meet human needs.

After graduation in 1983 he went to Nicaragua to work as a volunteer under the sponsorship of the Nicaraguan appropriating technology project, the name appropriate technologies the term widely used for technology suited to the needs of small producers rural and a urban specially in the developing world. In the spring of 1994 Linder joined to project to provide a power to the rural area in the mountains of northern Nicaragua that had no reliable source of electric power.

Refrigeration for medical supplies an electric lights to hold evening classes both require electricity a small scale hydroelectric plant was feasible but because, electricity had not been available there were neither machine shops nor skilled mechanics. Plants were made to accomplish the construction by teaching local people how to build operate and maintain the plant themselves. Linder taught local people how to work with concrete and

use hand tools by May of 1986 when the plant was operational many peasants had new skills and several were fully competent to run and maintain the plant.

The plant was used to power a small machine shop and support a medical center with a refrigerator. Plants included a future sawmill carpentry shop and facilities to make cement blocks bricks and roof tiles for the local area. During the 1980's the contras were working to overthrow the Nicaraguan Sandinista government their strategy was to attack farmers, teachers and medical workers in outlying areas to weaken the government.

The contras had been especially active in the area where Linder was working, when an organization of a American citizens living in Nicaragua sued in us code to stop the us government from funding the contras Linder joined the suit. In his affidavit he said he believed that his life was endangered the suit was unsuccessful but Linder continue to be committed to his work, 2 years later he was killed by the contras while making rainfall and flow rate measurements. In 1988 the IEEE SSIT award for outstanding service in the public interest was awarded to Benjamin Linder for his courageous and altruistic efforts to create human good by applying his technical abilities.

So, there what we find is like this case addresses how a person went to areas were reserved for the public good like educated people to become self sufficient and knowledgeable enough. So, that they can take up the responsibilities and create facilities which are lacking in that particular area which could improve the quality of life of people of that area. So, this story is about an engineer who sacrificed his life for ethical consults.

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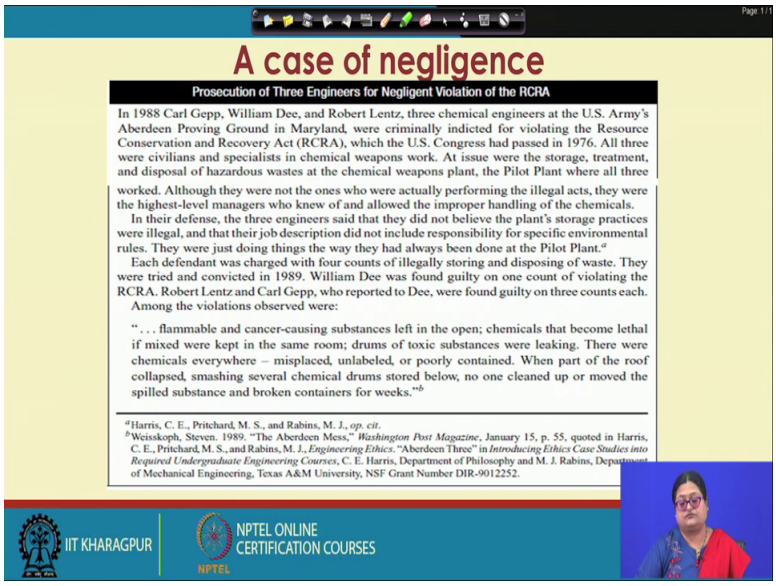

So, we have already discussed this case earlier about the prosecution of 3 engineers for negligent violation of RCRA. So, where we this actually these 2 cases are contrast to each other in the earlier one, we found like where one engineer like realizes his professional calls and ethics goes to a place tries to uplift the conditions of the people in that area. So, that their living conditions and quality of life improves and in that process sacrifices his life and this case where we are talking of Carl Gepp, William Dee and Robert Lentz which have already discussed earlier, these case talks of 3 engineers who may not have like done something, may not have been directly responsible for the violation of conservation and recovery act may not may not have done something directly.

But it was found it was their act of negligence by following the usual practice because, they being engineers they knew like what is the way of storing things what is the correct way of storing things what is the safety process to be followed and what could be like the processes of hazardous storing of materials. But they were negligent in carrying a carrying out their duty, so what we find like as we have already discussed this case I am not going to discuss it again.

But, what we find it over there like they told like, in their defense the 3 engineers said that they did not believe the planned storage practices were illegal and that their job description did not include responsibility for specific environmental rules, they were just

doing things the way that they are always been done in the pilot plant. However, the each defendant was charged with 4 counts of illegally storing and disposing of waste, they were tried and convicted in 1989 William Dee was found guilty to on 1 count of violating the RCRA Robert Lentz and Carl Gepp reported to deep were found guilty on 3 counts each.

Among the violations observed where flammable and cancer causing substances left in open, chemicals that become lethal if mixed were kept in the same room drums of toxic substances were leaking there were chemicals everywhere misplaced unlabeled or poorly contained. When part of the roof collapse smashing several chemical drums stored below no one cleaned up or move the speed substances and broken containers for week.

So, this talks of again like what is extending like we already discussed about actually we always go by the written codes written job description or we should exercise or individual responsibilities professional responsibilities also while we are deciding about things.

So, even though it may be true like their job description it was not written to be responsible about this environment to things, but it they were negligent in not carrying out their professional responsibility of maintaining things in a proper way which their professional responsibility guides. Because they are as a professions professional they are in charge of the safety and security of the public at large and the way that these things are stored showed like the safety is at stake and for that they are like they have done the unethical things and it is a act of negligence.

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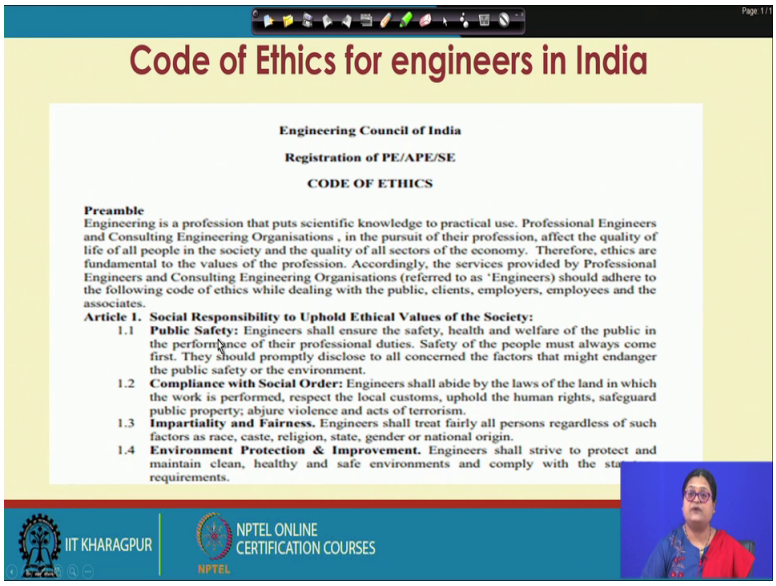

So, engineering council of India has stated various codes of ethics and in a preamble it states engineering is a profession that puts scientific knowledge to practical use professional engineers and consulting engineering organizations in the pursuit of their profession affect the quality of life of all people in the society and quality of all sectors of economy.

Therefore, ethics are fundamental to the values of the profession, accordingly the services provided by professional engineers and consulting engineering organizations referred to as engineers should adhere to the following code of ethics while dealing with the public clients employers employees and associates. Article 1; social responsibility to uphold ethical values of the society which talks of public safety, engineer should ensure the safety health and welfare of the public in large and performance of their professional duties.

Safety of the people must always come first, they should promptly disclose all concern the factor that might endanger the public safety or the environment, compliance with social order engineers shall abide by the laws of the land in which the work is performed. Respect the local customs, uphold the human rights, safeguard public property, abjure violence and acts of terrorism. Impartiality and fairness, engineers shall treat fairly all persons regardless of such factors as race, caste, religion, state, gender or national origin.

Environment protection and improvement engineers shall strive to protect and maintain clean healthy and safe environments and comply with the statutory requirements.

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Article 2; responsibility to maintain high standards of professional quality, these professional responsibilities include the following development of technical and managerial skills, engineers shall maintain state of the art professional skills continued professional development and provide opportunity for the professional development of those working under the command.

Undertake assignment were professionally competent engineers shall perform service only in the area of their technical competence, performance responsibility engineers shall seek work through fairer proper methods and shall take full responsibility for the task undertaken by them. Proper verification of documents and production processes, engineers shall approve only those designs which safely and economically meet the requirements of the client and shall not approve any engineering document design material stages of work which they consider to be unsound.

Article 3; obligation to maintain high standard of personal behavior in a responsible manner, honesty and integrity in profession and dealing engineers shall maintain high degree of honesty and personal integrity in all their professional dealings, they shall conduct themselves in a fair honest and respectable manner.

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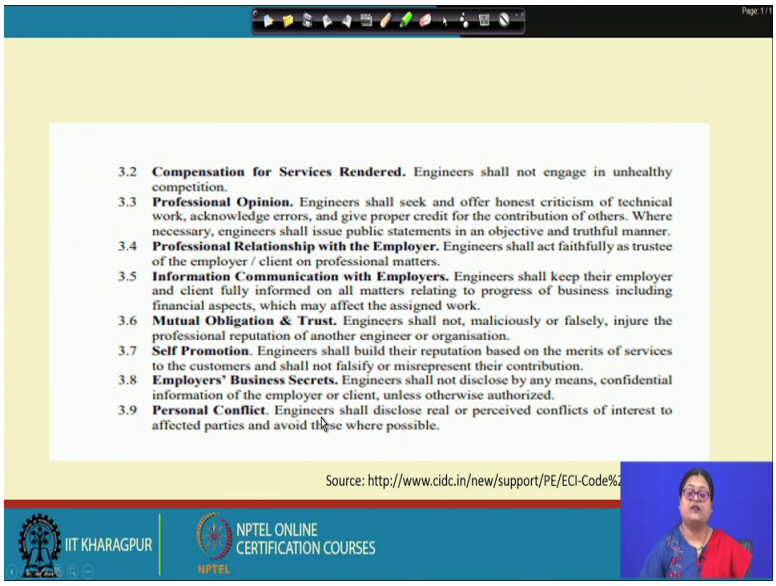

Compensation for a services rendered; engineers shall not engage in unhealthy competition, professional opinion engineers shall seek an offer honest criticism of technical work acknowledge errors and give proper credit for contribution of others. Where necessary engineers shall issue public statements in an objective and truthful manner, professional relationship with the employer engineers shall act faithfully as trustee of the employer client and professional matters. Information communication with employers; engineers shall keep their employer and client fully informed on all matters relating to progress of business including financial aspects which may affect the assigned work.

Mutual obligation and trust; engineers shall not maliciously or falsely injure the professional reputation of another engineer or organization. Next is self promotion, engineers shall build the reputation best of the merits of services to the consumers and shall not falsify or misrepresent their contribution. Employers business secrets, engineers shall not disclosed by any means confidential information of the employer or client unless otherwise honor they are authorized to do with. Personal conflict, engineers shall disclose real or perceived conflicts of a interest to affected parties and avoid these where possible.

So, here what we see like in this particular session we have discussed about what is a profession, we have understood the attributes of profession, we have understood why

engineering is a profession and we have understood for how engineering as a profession is different from other professions. We have understood the 2 different types of a ethical dilemma and how codes of ethics help us to answer these ethical dilemma. We have discussed about the 8 different codes of ethics and for engineers and we have gone through a detailed discussion of each of these codes of ethics.

We have also debated about and discussed about like should we always say like it is there in the code of ethics or not there is a code of ethics and we will lessen our individual responsibility for a particular action ethical or a unethical, mostly unethical action by taking shelter under the code of ethics or along with the code of ethics whether it is there written explicitly or it is implicitly expected a first. It is a individuals responsibility of the engineers to follow their individual responsibility and profession and responsibility while answering for ethical dilemma and we have also discussed about the codes of ethics as mentioned in the cases.

As mentioned in the Indian system for the codes of ethics for the engineers, which shows the safety health and welfare of the public at large is the major concern for the engineers is a major responsibility of the engineers. They should always be focused towards it and it is their primary responsibility and whether mentioned in the codes of ethics or not for a particular organization they it is a primary professional responsibility of the engineer to follow it and given a dilemma situation.

It is that which should be answered first like the safety issue of the public at large should be answered first and they should carry out their profession in such a way that it focuses on the welfare of the public at large wellbeing of the public at large and try to and through their profession try to improve on the quality of life of the public at large.

Thank you.