

Ethics in Engineering Practice
Prof. Susmita Mukhopadhyay
Vinod Gupta School of Management
Indian Institute of Technology, Kharagpur

Lecture - 11
Ethics as Design doing Justice to Moral Problems (Contd.)

Welcome back. Now, we will discuss about the duty ethics, rights ethics, virtue ethics. Then we will discuss a case and see the application of all these theories in how we solve a moral dilemma, and we will get to understand some techniques of solving ethical dilemmas. So, let us start with the discussion of duty ethics.

(Refer Slide Time: 00:45)

Page 10/10

Duty ethics

Two other ethical theories—duty ethics and rights ethics—are similar to each other and will be considered together.

These theories hold that those actions are good that respect the rights of the individual. Here, good consequences for society as a whole are not the only moral consideration.

A major proponent of duty ethics was Immanuel Kant (1724–1804), who held that moral duties are fundamental. Ethical actions are those actions that could be written down on a list of duties: be honest, don't cause suffering to other people, be fair to others, etc.

These actions are our duties because they express respect for persons, express an unqualified regard for autonomous moral agents, and are universal principles [Schinzinger and Martin, 2000].

Once one's duties are recognized, the ethically correct moral actions are obvious. In this formulation, ethical acts are a result of proper performance of one's duties.

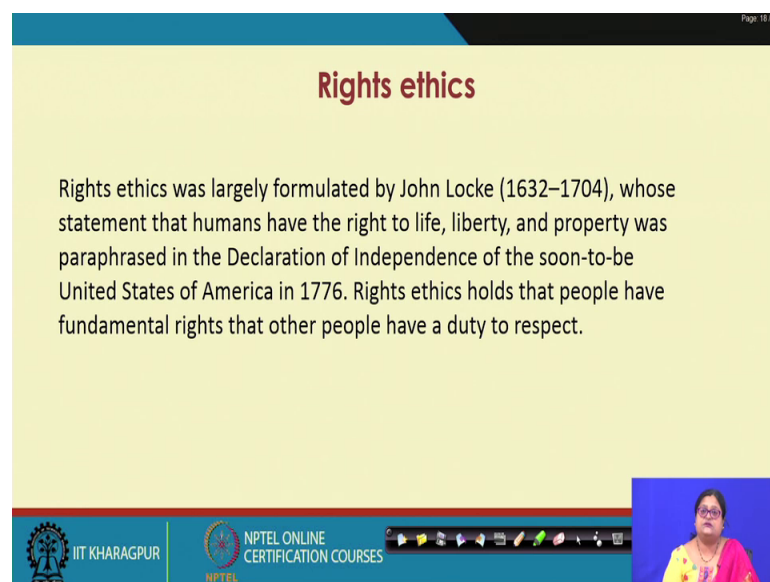
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The 2 ethical theories of duty ethics and rights ethics are similar to each other, and we will be considering here both of these things together. So, both of these theories tries to hold that those actions are good which you respect the rights of the individual. So, here we see a departure from the utilitarian concept, if you remember in utilitarianism we were more focused on the wellbeing of a group of people the collectivist approach, but rights and duties perspective are focusing more on the rights of the individual. So, here, good consequences for the society at larger not the only moral consideration. So, one of the major proponent of duty ethics was Immanuel Kant. So, who for him held that the moral duties are fundamental?

Ethical actions are those actions that could be written down on as a sort of list of duties. Like be honest, do not cause suffering to other people, be fair to others etcetera. So, again if we see like this be honest, do not cause suffering to others, and be fair to others, again if you see these have some link to the act utilitarianism concept also. When we are looking and the acts of the individuals what they need to do so that it leads to the collective wellbeing. Here what you are telling these are the acts duties to be followed by individuals so that the corresponding connected other set of individuals will be enjoying their rights. Because we respect the rights of some person of the other individual and. So, it is a duty of the part of one for connected other individual to be honest like not to cause suffering to other people and to be fair to others.

So, these actions are our duties because the express respect for persons, express an unqualified regard for the autonomous moral agents, and there these are with universal principles. Once one's duties are recognized, the ethically correct moral actions are obvious. In this formulation ethical acts are a result of proper performance of one's duties. So, if we understand like what is our duty if we respect the rights of others and if we have respect for others, we and we understand our set of duties towards our self and towards others, then we will be doing actions which are ethically correct.

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The slide features a yellow background with a blue header and footer. The title "Rights ethics" is centered in a dark red font. The main text is in a black serif font. At the bottom, there are logos for IIT KHARAGPUR and NPTEL ONLINE CERTIFICATION COURSES, along with a small video inset of a woman in a pink and yellow sari.

Rights ethics

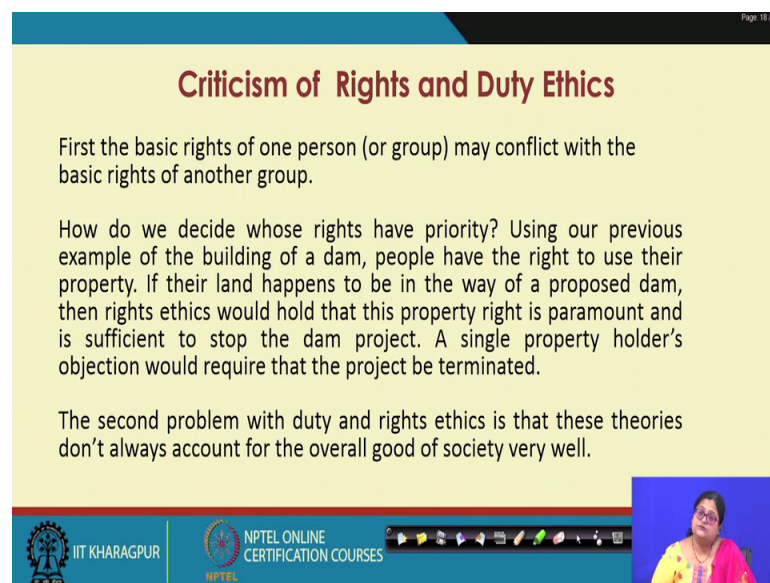
Rights ethics was largely formulated by John Locke (1632–1704), whose statement that humans have the right to life, liberty, and property was paraphrased in the Declaration of Independence of the soon-to-be United States of America in 1776. Rights ethics holds that people have fundamental rights that other people have a duty to respect.

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Rights ethics was given by John Locke whose statement that human beings have a right to life liberty and property was paraphrased in the declaration of independence of the

soon to be united states of America in 1776. So, I chopped off rights ethics holds that the people have a fundamental rights that others have a duty to respect. So, that is why we are discussing both these theories together. It is not enough to claim or to understand that we have rights. It is equally important that the other connected people related to us do their corresponding duties. Because we can like enjoy our rights only when the corresponding duty is performed.

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The slide is titled "Criticism of Rights and Duty Ethics" in a dark red font. The background is light yellow. The text on the slide reads: "First the basic rights of one person (or group) may conflict with the basic rights of another group." followed by "How do we decide whose rights have priority? Using our previous example of the building of a dam, people have the right to use their property. If their land happens to be in the way of a proposed dam, then rights ethics would hold that this property right is paramount and is sufficient to stop the dam project. A single property holder's objection would require that the project be terminated." and finally "The second problem with duty and rights ethics is that these theories don't always account for the overall good of society very well." The slide includes logos for IIT KHARAGPUR and NPTEL ONLINE CERTIFICATION COURSES at the bottom. A small video inset of a woman is visible in the bottom right corner of the slide.

And we can also tell like this may extend to if he ever write to leave, and then others do have a duty to respect that and do the corresponding duty. Sometimes it is a duty for person to himself or herself also. If I need to establish a particular right then I need to realize my corresponding part of duty also. So, we can discuss it that way also. So, rights and duties goes hand in hand. The rights can only been established only when the corresponding duty towards it is perfect.

Now, you will see the criticism of the rights and duty ethics. In case, just like the utilitarianism concept that we were discussing. The basic right of one person or a group may conflict with the basic rights of the another person or of another group. Dilemma may come over; like, then whose rights do we priorities whose rights we will answer to like in the example of the building of the dam. So, people have the right to use their property.

So, if their land happens to be in the way of a proposed dam, then rights ethics would hold let the paramount right is the property right is paramount and is sufficient to stop the dam project. A single property holder's objection would require that the project be terminated. So, how do we prioritize for it?

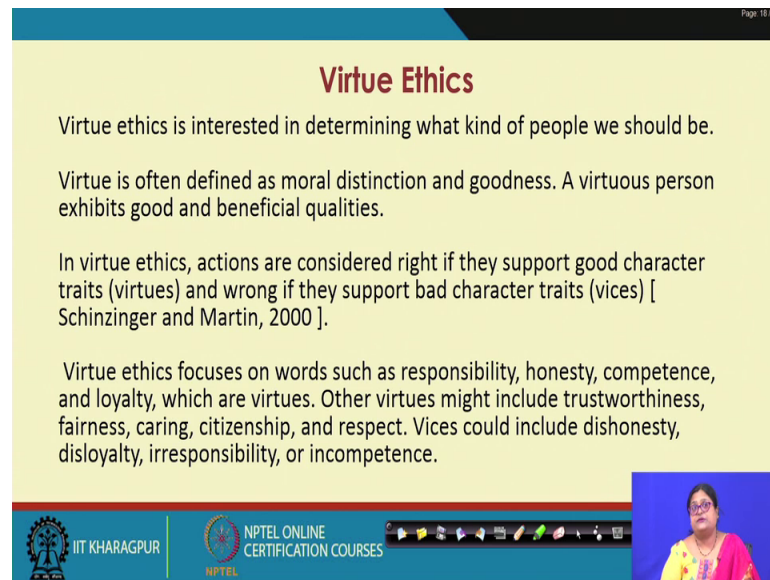
So, and when this comes in next question will come about the justice, fairness of distribution fairness of process. Because if we are prioritizing right of the we person in terms of like the dam is more important, and we are the like somewhat not prioritizing the right of the property for the person, then the person needs to be properly compensated for the loss of the property, and there will come the compensatory justice; which is at the should be equivalent to the value of the property and the loss that the person is incurring due to the project.

So, that will bring us into the discussion of the fairness of the process of the, or the fairness of the distribution of justice. The second problem with duty and right ethics is that these theories do not account for the overall good of the society very well. Like you listen to the dam project, if we tell like if we try to say like the person's right to properties per amount, and then and that is why this dam is not required over here.

So, we have to understand, we have to question we have to go through many of the rational questioning of why questions that we need to ask why is the dam who are going to get benefit of it can it have some alternate places why in this location, what can we write do it in a different design. So, that this person's interest is maintained and also the dam could be done.

So, these type of analysis needs to be thinking needs to be done time and again before we arrive at a particular solution. So, the drawback of the rights and duties theories in it focuses more on the individuals and somewhat less on the like overall requirement of a particular society.

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Virtue Ethics

Virtue ethics is interested in determining what kind of people we should be.

Virtue is often defined as moral distinction and goodness. A virtuous person exhibits good and beneficial qualities.

In virtue ethics, actions are considered right if they support good character traits (virtues) and wrong if they support bad character traits (vices) [Schinzinger and Martin, 2000].

Virtue ethics focuses on words such as responsibility, honesty, competence, and loyalty, which are virtues. Other virtues might include trustworthiness, fairness, caring, citizenship, and respect. Vices could include dishonesty, disloyalty, irresponsibility, or incompetence.

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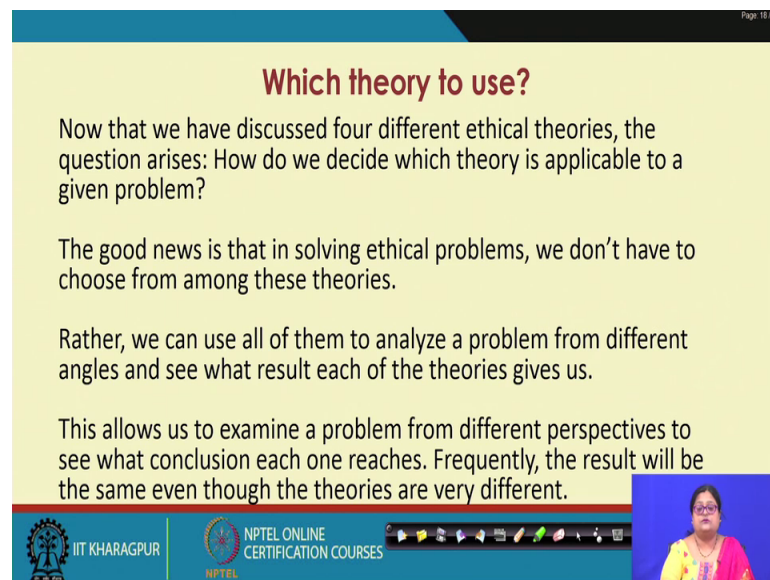
Next, we will come to the discussion of virtue ethics, which is the a formal theory which is focused more on the nature of the person who is making a particular decision. Till now we have discussed about the how decisions are made, and what is the outcome of the decision and whether it is like right or wrong ethical unethical, how the decision is made whether it is as a preprocess whether it is right or wrong. But we have not focused on the qualities of the decision maker, virtue ethics focuses on the qualities of the traits of the decision maker who makes the decision.

So, it is interested in determining what kind of person we should be. Virtue is often defined as a moral distinction and goodness of virtuous person exhibits good and beneficial qualities. In virtue ethics actions are considered to be right if the support good character traits, and wrong if the support bad character traits. Virtue ethics focuses on words such as responsibility, honesty, competence and loyalty which are virtues. Other virtues may include trustworthiness, fairness, caring citizenship and respect. Vices could include dishonesty, disloyalty, irresponsibility and incompetence.

So, if we have these qualities like trustworthiness, fairness, caring and respect generally it is the philosophy of life it is the view. It is the worldview of a particular person who is tried to make a moral decision. And so, these possessing these qualities like trustworthiness, fairness, caring, citizenship, respect for the rights of others and so, being responsible honest competent loyal.

So, these will generate qualities within the person within the decision maker, which will give him and her a perspective to look at moral dilemmas in such a week. That person will get a very holistic outlook of life to look at the problem from various perspectives and take a decision which is on the right ethical track.

(Refer Slide Time: 13:52)



Page 18/18

Which theory to use?

Now that we have discussed four different ethical theories, the question arises: How do we decide which theory is applicable to a given problem?

The good news is that in solving ethical problems, we don't have to choose from among these theories.

Rather, we can use all of them to analyze a problem from different angles and see what result each of the theories gives us.

This allows us to examine a problem from different perspectives to see what conclusion each one reaches. Frequently, the result will be the same even though the theories are very different.

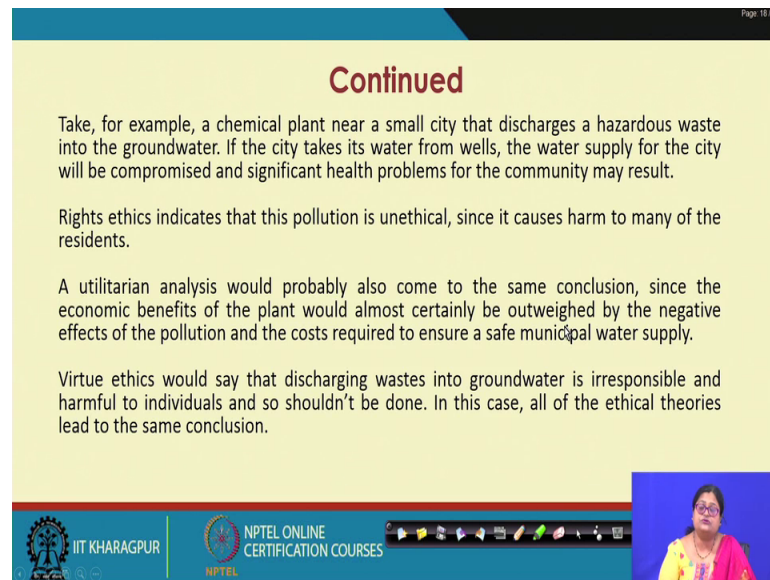
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Now, when we have discussed all theories together, question come up we understand 4 different approaches of ethical problem solving each having it is benefits and also restrictions. Now, given a situation which is that theory that we are going to use?

Now, we are trying to discuss that with the help of a case. So, as we told you when you have discussed ethic different ethical theories. So, we have to understand like which theories to use. So, it will help us if we discuss with the case 2. It will help us to see what different angles to be taken to a specific problem analyze it from different angles. And so, and we can help us to see what conclusion one reaches. And the frequently it may so happen that the results will be same even though the theories are different.

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Page 18/18

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Take, for example, a chemical plant near a small city that discharges a hazardous waste into the groundwater. If the city takes its water from wells, the water supply for the city will be compromised and significant health problems for the community may result.

Rights ethics indicates that this pollution is unethical, since it causes harm to many of the residents.

A utilitarian analysis would probably also come to the same conclusion, since the economic benefits of the plant would almost certainly be outweighed by the negative effects of the pollution and the costs required to ensure a safe municipal water supply.

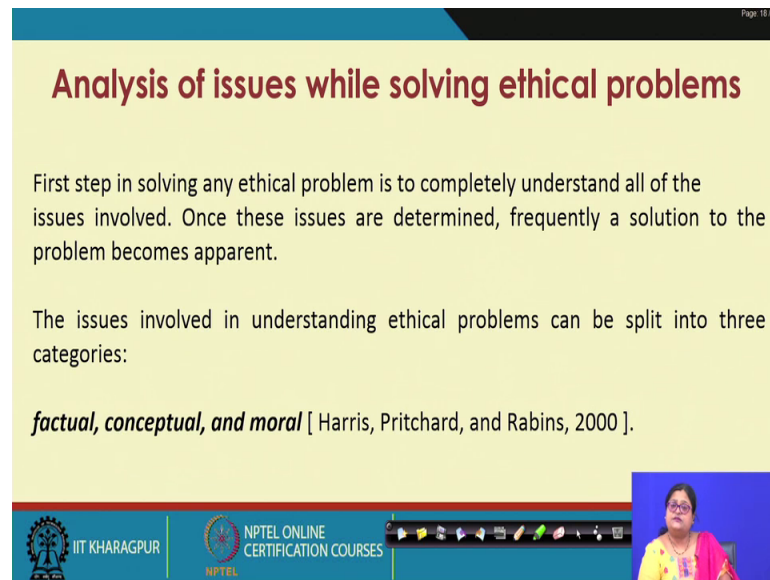
Virtue ethics would say that discharging wastes into groundwater is irresponsible and harmful to individuals and so shouldn't be done. In this case, all of the ethical theories lead to the same conclusion.

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So, that is going to give a cross check again. So, let us assume like there is a chemical plant near a small city that discharges the hazardous waste into then groundwater. If the city takes water from the wells, the water supply for the city will be compromised. And the significant health problems for the community may result. The right ethics indicates that this pollution is unethical since it causes harm to many of the residents. Utilitarian analysis will also probably come to the same conclusion, since the economic benefit of the plant would almost certainly be outwitted by the negative effects of the pollution and the course required to ensure our safe municipal water supply. Virtue ethics would say that the discharging waste into groundwater is an irresponsible act and harmful to individuals and should not be done. In all this case, all of the ethical theories lead to the same conclusion.

(Refer Slide Time: 16:57)



Page 18/18

Analysis of issues while solving ethical problems

First step in solving any ethical problem is to completely understand all of the issues involved. Once these issues are determined, frequently a solution to the problem becomes apparent.

The issues involved in understanding ethical problems can be split into three categories:

factual, conceptual, and moral [Harris, Pritchard, and Rabins, 2000].

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But though in this case, it has late to the same conclusion it may of sometimes happened that all the ethical theories may not lead to the same conclusion also. It like we saw in the example of the damn, we may try to prove from the utilitarian perspective like it is good to have the damn because it is beneficial maybe for a larger set of individuals, but finer looking to the problem through the cost benefit analysis or through rights and duties. And virtue ethics may show like it will be beneficial if certain corrective actions are taken to answer for the harm caused to the people.

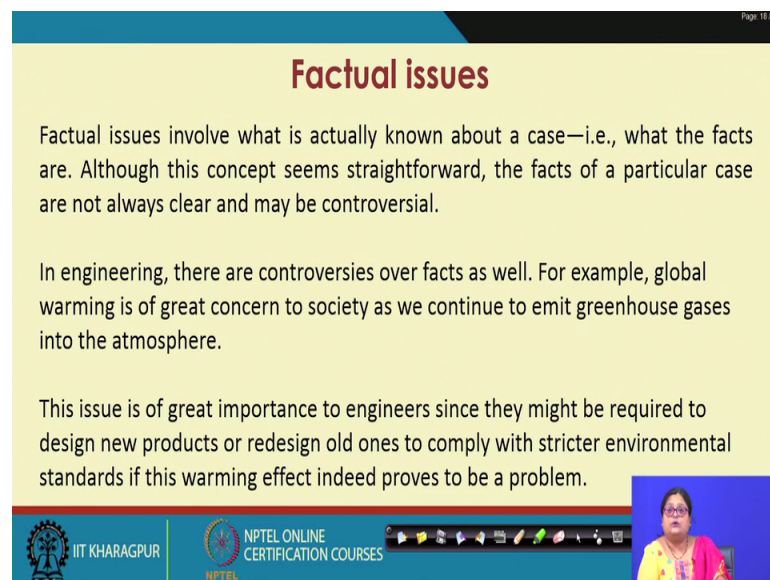
And, to respect their rights, and show our corresponding duties towards them. So, that they enjoy their rights, and we are acting in a responsible way towards them. And maybe this will be the extension of the discussions where we talk of corporate social responsibilities. Because every project that we do, we cannot cream like we are not harming anyone, every project that we do every design that we do have a hard part involved in it we cannot escape that, we cannot deny that.

But then should we stop it stop doing the project? It depends on the what actions we have taken to minimize the harm and to make the life better for the people or for the stakeholders who are suffering paying the cost for the benefit of it, benefit that we think like our project is going to bring in. And how the we are acting as engineers, as designers how in a more responsible way we are acting? We recognize and we act towards minimizing the harm in a proactively.

What precautions should we take? What are the proactive measures that we take to answer to the right? What do you think do we feel like we have towards answering to the rights of the people whose like rights are getting compromised? Because we are trying to bring in benefits for a larger set of people. So, what balancing act we are doing for it is a major concern and it is a major challenge of the whole project and the design.

So, while analyzing even issues of solving ethical problems so, we have to understand. So, what are the issues which are present in the problem? Once we can understand the issues which are present in the particular problem, then finding a solution to the problem because somewhat easy. The issues which are involved in understanding ethical problems can be split into 3 categories factual, conceptual and moral.

(Refer Slide Time: 21:55)



Factual issues

Factual issues involve what is actually known about a case—i.e., what the facts are. Although this concept seems straightforward, the facts of a particular case are not always clear and may be controversial.

In engineering, there are controversies over facts as well. For example, global warming is of great concern to society as we continue to emit greenhouse gases into the atmosphere.

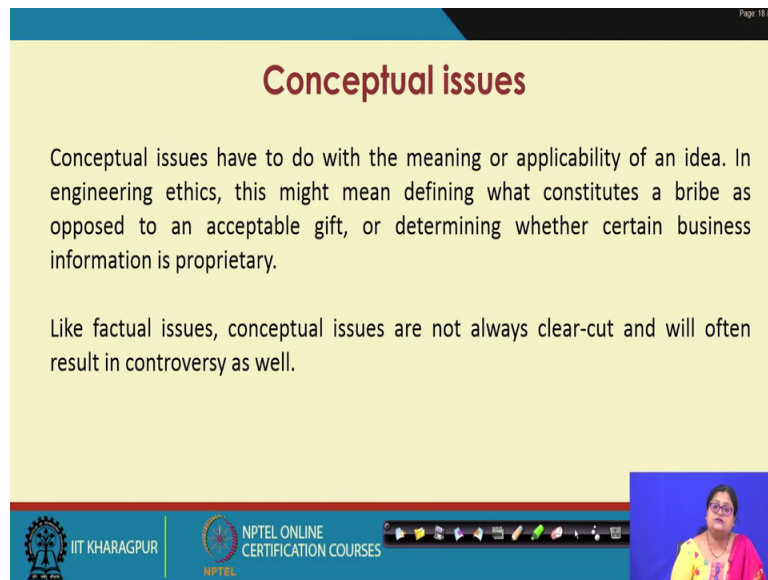
This issue is of great importance to engineers since they might be required to design new products or redesign old ones to comply with stricter environmental standards if this warming effect indeed proves to be a problem.

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Now, what are the factual issues? Factual issues involved what is actually known about the case. So, what the facts are? Although this concept seems straightforward, the facts of a particular case are not always clear and may be controversial. In engineering there are controversies over facts as well. So, like global warming is of great concern to society as we continue to emit greenhouse gases into the atmosphere.

These issues of great importance to engineers since they might be required to design new products of redesigned old ones to comply with stricter environmental standards if this warming effect indeed proves to be a problem.

(Refer Slide Time: 23:01)



Page 18/18

Conceptual issues

Conceptual issues have to do with the meaning or applicability of an idea. In engineering ethics, this might mean defining what constitutes a bribe as opposed to an acceptable gift, or determining whether certain business information is proprietary.

Like factual issues, conceptual issues are not always clear-cut and will often result in controversy as well.

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Second the conceptual issues. Conceptual issues deals with the meaning or meaning or applicability of a particular idea. In engineering ethics this might mean defining what constitutes a bribe as opposed to acceptable gift, or determining whether certain business information is proprietary.

So, these are abstract concepts and how it gets a applied may change and for the purpose for what it is getting applied may determine, whether if you get something whether it is a gift or it is a price, then which information of a business is proprietary and which is not. So, like factual issues conceptual issues are always clear cut and may resulting controversy as well.

(Refer Slide Time: 24:09)

Page 18/18

Moral issues

Once the factual and conceptual issues have been resolved, at least to the extent possible, all that remains is to determine which moral principle is applicable to the situation. Resolution of moral issues is often more obvious.

Once the problem is defined, it is usually clear which moral concept applies, and the correct decision becomes obvious.

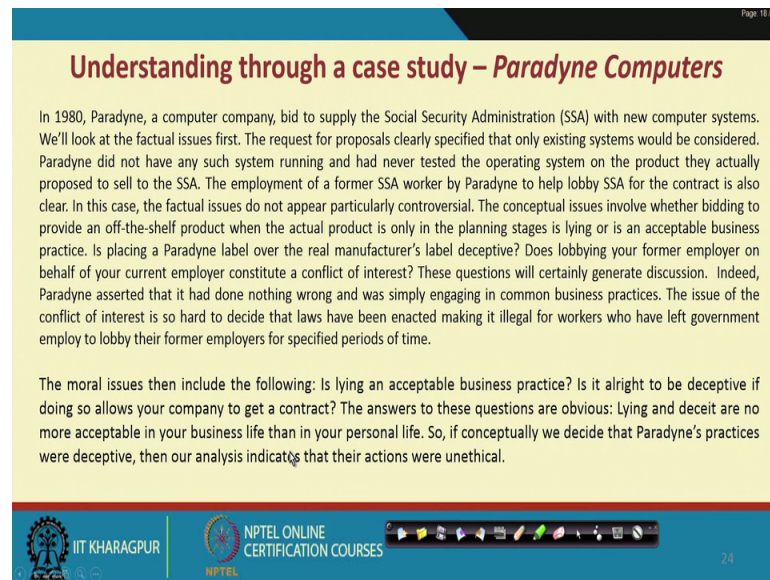
For eg, in case when a “gift” is offered by a sales representative, once it is determined whether it is simply a gift or is really a bribe, then the appropriate action is obvious. If we determine that it is indeed a bribe, then it cannot ethically be accepted.

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Next we come to moral issues. So, what is the factual issues and conceptual issues have resolved? So, then we have to understand which is the moral principle which is applicable to the situation. So, resolution of moral issues is often more obvious. Once the problem is defined it is usually clear with moral which moral concept applies and the correct decision becomes obvious, but for to reach at this stage the previous to exercises of defining the stating the facts correctly, getting the concepts clear correctly is very important. So, that the we can get a background to solid platform to apply your moral theories.

For example, in the case, when a gift is offered by a sales representative, once it is determined whether it is simply a gift or is really a bright then the appropriate action is obvious. If we determine it is a bribe, then it cannot be ethically accepted for this analysis and the previous stages or fractal conceptual level is very important.

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Page 18/18

Understanding through a case study – Paradyne Computers

In 1980, Paradyne, a computer company, bid to supply the Social Security Administration (SSA) with new computer systems. We'll look at the factual issues first. The request for proposals clearly specified that only existing systems would be considered. Paradyne did not have any such system running and had never tested the operating system on the product they actually proposed to sell to the SSA. The employment of a former SSA worker by Paradyne to help lobby SSA for the contract is also clear. In this case, the factual issues do not appear particularly controversial. The conceptual issues involve whether bidding to provide an off-the-shelf product when the actual product is only in the planning stages is lying or is an acceptable business practice. Is placing a Paradyne label over the real manufacturer's label deceptive? Does lobbying your former employer on behalf of your current employer constitute a conflict of interest? These questions will certainly generate discussion. Indeed, Paradyne asserted that it had done nothing wrong and was simply engaging in common business practices. The issue of the conflict of interest is so hard to decide that laws have been enacted making it illegal for workers who have left government employ to lobby their former employers for specified periods of time.

The moral issues then include the following: Is lying an acceptable business practice? Is it alright to be deceptive if doing so allows your company to get a contract? The answers to these questions are obvious: Lying and deceit are no more acceptable in your business life than in your personal life. So, if conceptually we decide that Paradyne's practices were deceptive, then our analysis indicates that their actions were unethical.

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We will try to understand this through a case study which we call Paradyne computers. In Paradyne computers what happened? It is a computer company which is bid to supply the social security administration with new computer systems. So, will look at the factual issue first, the request for proposals clearly specified that the only existing systems will be considered. Paradyne did not have any such system running, and had never tested the operating system on the product they actually propose to sell to the SSA. The employment of a former SSA worker by Paradyne to help lobby SSA for the contract is also clear. In this case, the factual issues do not appear particularly controversial.

The conceptual issues involved whether bidding provide and off the shelf product with the actual product is only in the planning stage is lying or is an acceptable business practice. In placing a Paradyne level over the real manufacturers label deceptive. Does lobbying your former employer on behalf of your current employer constitute a conflict of interest? These questions will generate discussions. Because these are conceptual and the conceptual level these are points of dilemma questions.

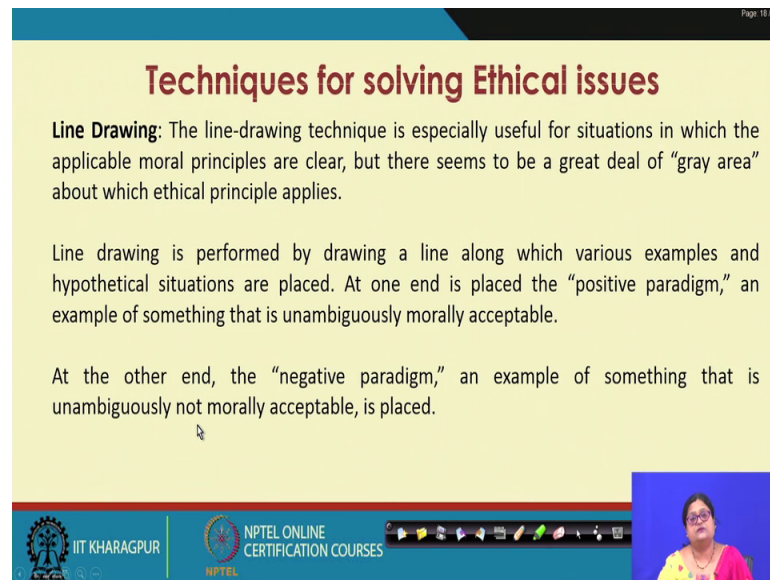
So, these questions will certainly generate discussion. Indeed, Paradyne asserted that it had nothing done wrong and was work simply engaging in common business practices. The issue of the conflict of interest is so hard to decide that laws have been enacted making it illegal for workers who have let the government employ to learn to lobby their former employers for specified period of time.

So, the conceptual issues involved whether like providing an off the shelf product with actual product is on the planning stage, whether it is lying because in the factual stage it is stole only existing systems would be considered. But Paradyne did not have any such system running. Again it has put his own level on another like, on the real manufacturers level was it also like hiding one's own identity. And then having this new employee to lobby for Paradyne to assessing was it ethical or not can we do it in that way. So, these are the conceptual issues.

The moral issues then include the following. Is lying and acceptable business practice? Because we find lying has happened over here. Is it all right to be deceptive? If doing so allows you company to get a contract, because we pasting the sticker on level on the existing life of the real manufacturers level is it is a deceptive case that we have done. So, here what happen? Lying and deceit if it is not acceptable in a personal value system, if it is not accepted in a person's own life. Then it is not accepted equally in business situations also. So, if conceptually we decide that paradigms practices were deceptive, then our analysis indicates that their actions were unethical.

So, if from we get or concepts clear over here, if we study the fact over here, and get a concepts over here and come to the conclusion yes they have lied, they have been deceptive, they have used the persons inner employees contacts in a wrong way to get certain benefits. If these are the conclusions, and if these are not acceptable in persons own individual life situations, these are not like welcome things to be done then equally so, in business situation these are not ethical practices.

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Page 18/18

Techniques for solving Ethical issues

Line Drawing: The line-drawing technique is especially useful for situations in which the applicable moral principles are clear, but there seems to be a great deal of “gray area” about which ethical principle applies.

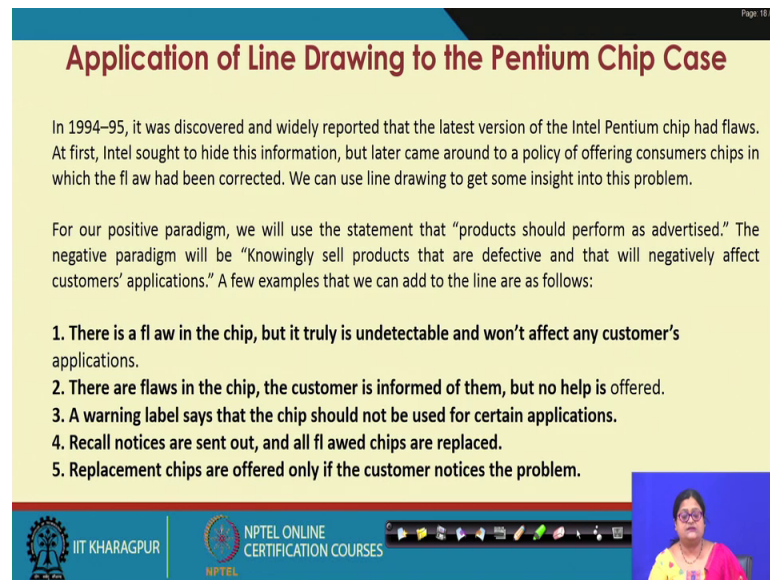
Line drawing is performed by drawing a line along which various examples and hypothetical situations are placed. At one end is placed the “positive paradigm,” an example of something that is unambiguously morally acceptable.

At the other end, the “negative paradigm,” an example of something that is unambiguously not morally acceptable, is placed.

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So, we can try to understand these techniques through some techniques like which we call line drawing and flowchart. In line drawing technique is used for situations in which the applicable moral principles are clear, but there is a gray area about which the ethical principle applies. So, line drawing is performed by drawing a line along the various examples and hypothetical situations are placed. At one in this place the positive paradigm, and at the example of something that is unambiguously morally acceptable. At the other end the space placed a negative paradigm, an example of something which is unambiguously morally not acceptable and in between we like trial going on increasing the line.

(Refer Slide Time: 32:34)



Page 18/18




Application of Line Drawing to the Pentium Chip Case

In 1994–95, it was discovered and widely reported that the latest version of the Intel Pentium chip had flaws. At first, Intel sought to hide this information, but later came around to a policy of offering consumers chips in which the flaw had been corrected. We can use line drawing to get some insight into this problem.

For our positive paradigm, we will use the statement that “products should perform as advertised.” The negative paradigm will be “Knowingly sell products that are defective and that will negatively affect customers’ applications.” A few examples that we can add to the line are as follows:

1. There is a flaw in the chip, but it truly is undetectable and won’t affect any customer’s applications.
2. There are flaws in the chip, the customer is informed of them, but no help is offered.
3. A warning label says that the chip should not be used for certain applications.
4. Recall notices are sent out, and all flawed chips are replaced.
5. Replacement chips are offered only if the customer notices the problem.

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So, we will try to see the application of this in a Pentium chip case. In 1994-95 it was discovered and widely reported, that the latest version of the Intel Pentium chip had flaws. At first Intel sought to hide this information a later came around to a policy of offering consumer chips in which the flaw had been corrected. We can use line drawing to get some insight into this problem. So, for a positive paradigm we will use the statement that products should perform as advertised. In the negative paradigm we will be knowingly selling products that it effective and that you have negative effect to customers’ applications.

A few examples that can act to the liners are follows, they go like there will be a flaw in the chip, but it truly is undetectable and will not affect any customers applications. There are flaws in the chip the customer is informed of them, but no help is upward. A warning label says that the chip should not be used for certain applications, recall notices are sent out and all flawed chips are replaced. And replacement chips are offered only the customer notices the problem.

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Page 18/18

Negative paradigm (NP) Positive paradigm (PP)

Sell defective products Products should be as advertised

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So, this we can see like these we can place in the like in increasing order from this side to a negative side to the way towards which is in a more positive way. And we can take a decision like which is the action which needs to be done which will move our actual solution that we are providing from a negative paradigm to a positive one.

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Continued

Where does our situation— “there is a flaw, customers aren’t informed, and the magnitude of the problem is minimized”—fit on this line? One possible analysis is the following:

NP PP

Sell defective products Products should be as advertised

According to this line-drawing analysis, the approach taken by Intel in this case wasn’t the best ethical choice.

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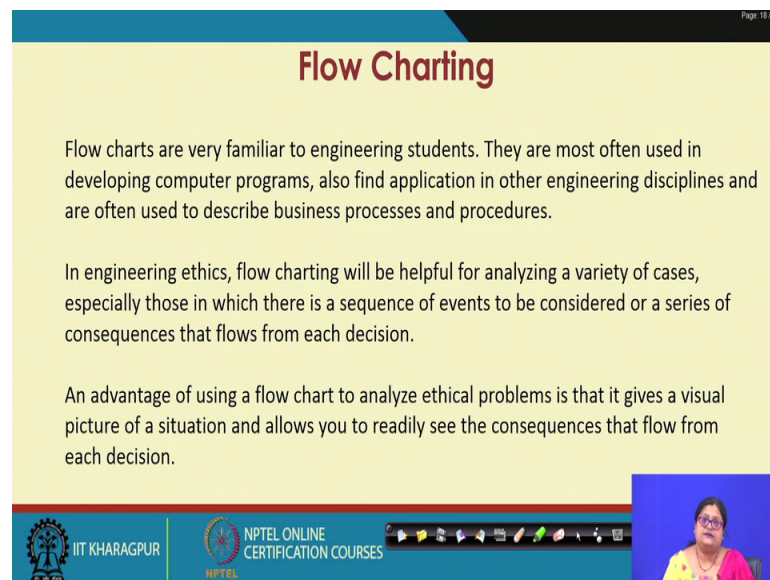
So, according to this line drawing the approach taken by Intel well was not the best of the ethical choices. Because what we find over here is first Intel sought to, hide live

information which is more on the negative paradigm, but let us come around to a policy of offering consumers chips in which the flow had been the corrective.

So, the who were these consumers how do we know like more consumers in times to come will not be suffering this. So, or like all the chips should be recalled back; o, these will be the actions that needs to be justified. And what we see over here is like Intel may not have qualified to this fully positive thing, but the products will be functioning as it is advertised.

So, the our situation there is a flaw customers are informed and the magnitude of the problem is minimized. So, there is a flaw customers are an inform and the magnitude of the problem is minimized fit on this line. So, it will fit there is a flaw somewhere over here, and like customers are not informed and magnitude of the problem is minimize will fit somewhere over here. Because the it is not one of the it has taken some measure to replace, but having like there is a flow and the customers are informed of it people in charge over here. So, it could somewhere be over in this wage.

(Refer Slide Time: 37:15)



Page 18/18

Flow Charting

Flow charts are very familiar to engineering students. They are most often used in developing computer programs, also find application in other engineering disciplines and are often used to describe business processes and procedures.

In engineering ethics, flow charting will be helpful for analyzing a variety of cases, especially those in which there is a sequence of events to be considered or a series of consequences that flows from each decision.

An advantage of using a flow chart to analyze ethical problems is that it gives a visual picture of a situation and allows you to readily see the consequences that flow from each decision.

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Speaker icon

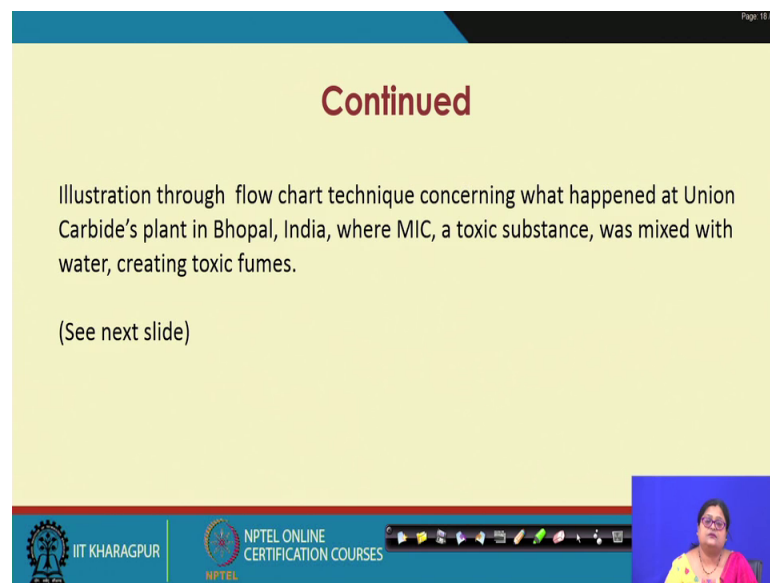
Video feed of a woman in a pink shirt.

Next technique is called flow charting. Flow charts are very familiar to engineering students. They are most often used in developing computer programs, also find application in other engineering situations and disciplines, and it is often used to describe business processes and procedures. So, in engineering ethics flow charting will be

helpful for analyzing a variety of cases especially those in which there is a sequence of events to be considered or a series of consequences that follows from each decision.

So, the advantage of flow chart to analyze an ethical problem is that it gives a visual picture of the situation and allows you to readily see the consequences that flows from each decision.

(Refer Slide Time: 38:12)



Page 18/12

Continued

Illustration through flow chart technique concerning what happened at Union Carbide's plant in Bhopal, India, where MIC, a toxic substance, was mixed with water, creating toxic fumes.

(See next slide)

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The slide features a yellow background with a blue header and footer. The text is centered. A small video inset in the bottom right corner shows a woman with glasses and a pink top. The footer contains logos for IIT Khharagpur and NPTEL, along with a navigation bar.

So, if we see use the flow chart technique to discuss about the union carbide plant in Bhopal case, where like a toxic substance released and we mixed with water to create toxic fumes, we will see like how it what led which incidentally to which happening and what were the consequences of it.

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Application of a simple flow chart to the Bhopal case, emphasizing potential decisions made during consideration of locating a plant in India.

So, first we see union carbide would like to build a planting profile. So, if it is there is always a yes no type of thing, first question to be asked is are safety laws in India as strict as in US. If it is yes, then the design the plant as in US. If it is no, then next question comes are local laws adequate for safe operation. If it is yes, then design according to local standards. If it is no, then there could be 2 options decide on minimal standards that will ensure local safety or build a plant anyway and assume risk.

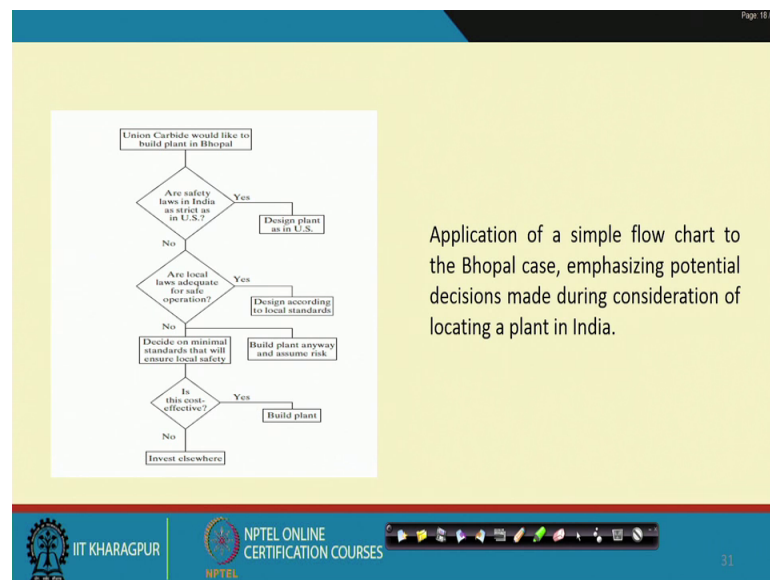
If we are designing according to decide on minimal standards that will ensure local safety, and we try to answer the question is this cost effective, then if it is yes then build a plant if it is no then invest elsewhere. So, application of a simple flowchart to the Bhopal case emphasizing the possible decisions made during consideration of the location of the plant in India. And what we see about maybe these were like the more concerned with about the strictness of the safety rules, and then in India then local laws present over there and what are the minimum safety rules, minimum standards for maintaining safety.

So, when your making a choice of where to put your plant, then what are the decisional flows that you take which guides your action. And what is then if you are moving like cost effective is and it also talks somewhere of your willingness. If it is so like may be our safety laws in India as frequency US if he has designed the plant as in US. If no, then you are going for these actions which are somewhat in a compromised nature. But, if you

are in a virtuous nature, if you are a virtuous kind of person where you really respect the safety rights of other person. And you realize your duties towards maintaining the safety of the other person did this flow of actions you may not have done.

Even if safety law rules and laws in India or that not strict nothing stops you from being proactive in nature to implement high degree of safety in the plant that you are to trying to do in India. That talks of your virtuous nature which life tries to give your perspective of life which helps you to respect your duties respect to rights of other person and realize your duties, to respect those rights to the of the individual and your duties to the society at large.

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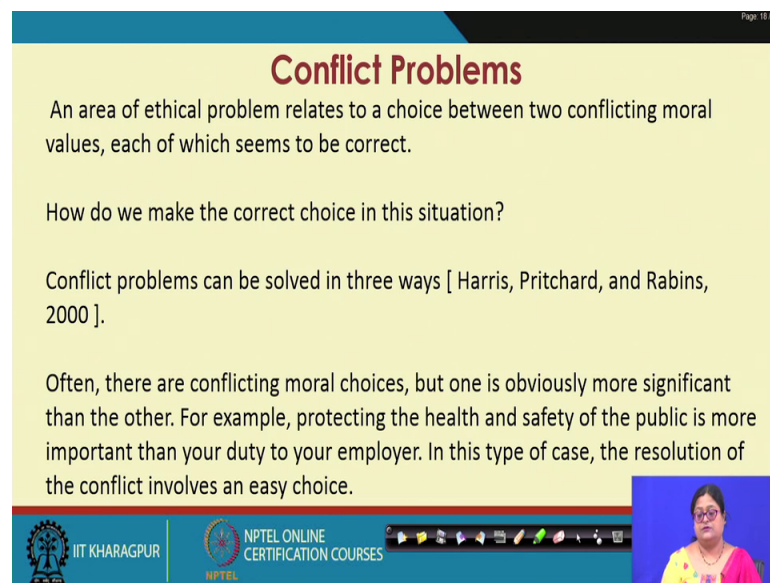
So, in continuation of that so, like maintenance needed of flare tower. So, is a MIC tank filled, if it is no go ahead, yes. Then, our other safe safety systems operating, no. Defer maintenance until other systems are available, if it is yes, will use other systems adequately prevent accidents, no then defer maintenance it is yes, perform maintenance an alternative flow chart for the Bhopal cave emphasizing decisions made when deactivating the flare tower for maintenance.

So, in this case against these flow of thought could have been happened, but which would have led them to go for this. But again wherever we are talking of this no, no and then go ahead and all this type of thing, it again talks of very much important is understanding the gravity of the situation, understanding our responsibility even if

something because this is such a high safety issue, what is our degree of responsibility, what is the degree of proactiveness required on a part, the duty required on our part to see; like, whether these things what you are assuming are really working or not. Have we taken enough measured? Have we done our duty properly to see whether these things are working? Or we have assumed like these are working, and we have gone ahead with the maintenance part.

So, again and again maybe at the cost of repeating we are talking of our as engineers focusing on the virtuous nature and the understanding the duties of engineers towards the safety security health of the are the persons are the stakeholders of the society at large, and to proactively check for the things instead of just assuming things will be are all right. And will be taking their own course of action. Because the harm provided or could be so large scale that even the cost could outweigh all the benefits of the project.

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The slide is titled "Conflict Problems" in a bold, dark red font. Below the title, the text reads: "An area of ethical problem relates to a choice between two conflicting moral values, each of which seems to be correct." This is followed by the question "How do we make the correct choice in this situation?". The next paragraph states: "Conflict problems can be solved in three ways [Harris, Pritchard, and Rabins, 2000]." The final paragraph explains: "Often, there are conflicting moral choices, but one is obviously more significant than the other. For example, protecting the health and safety of the public is more important than your duty to your employer. In this type of case, the resolution of the conflict involves an easy choice." The slide footer includes the IIT KHARAGPUR logo, the NPTEL ONLINE CERTIFICATION COURSES logo, and a small video inset of a woman in a pink shirt.

So, sometimes it may so happen there are conflict problems, and area of ethical problem relates to a choice between 2 conflicting moral values which both of them may seem to correct. So, how do we select in this situation can be done in 3 ways. So, like there could be conflicting moral choices, but one is; obviously, more significant than the other, like protecting the health and safety of the public is more important than our duty to the employer.

So, in this case the resolution of conflict is a very easy choice.

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A second solution is sometimes called the “creative middle way” [Harris, Pritchard, and Rabins, 2000]. This solution is an attempt at some kind of a compromise that will work for everyone.

The emphasis here should be on the word “creative,” because it takes a great deal of creativity to find a middle ground that is acceptable to everyone and a great deal of diplomacy to sell it to everyone.

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Second solution is sometimes called the creative middle way. So, this solution is an attempt at some kind of compromise that is going to work for everyone. So, the emphasis here is on the word created because it takes a great deal of creativity to find out the middle ground that is acceptable to everyone and with a great deal of diplomacy it can be sold to everyone.

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Steps for solving ethical dilemmas

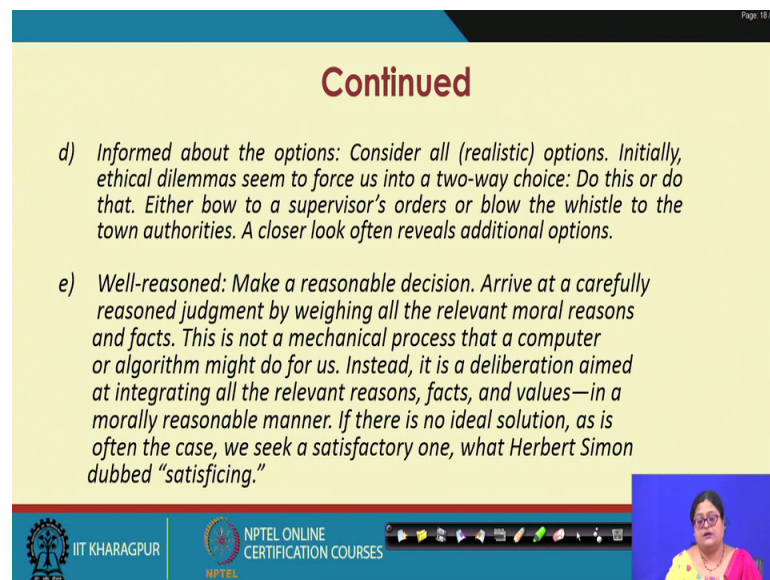
- a) *Moral clarity: Identify the relevant moral values – identifying moral values and reasons in the situation*
- b) *Conceptual clarity: Be clear about key concepts – be clear about the conceptual issues involved. What you are asked to do may not be good for the organization in long run*
- a) *Informed about the facts: Obtain relevant information. This means gathering information that is pertinent in light of the applicable moral values*

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And the steps to solving the ethical dilemma are like, we should have the moral clarity, identifying the relevant moral values. Identifying the moral values in visions in the

situation we should have conceptual clarity. Be clear about the key concepts. Be clear about the conceptual issues involved, what you are asked to do may not be good for the organization in the long run. Informed about the facts obtain relevant information, this means gathering information that is pertinent in the light of the applicable moral values.

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Page 18/18

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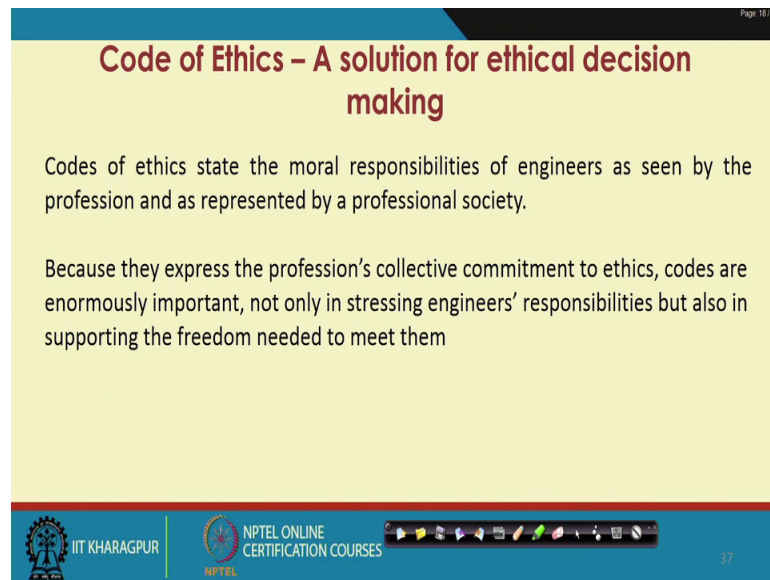
- d) *Informed about the options: Consider all (realistic) options. Initially, ethical dilemmas seem to force us into a two-way choice: Do this or do that. Either bow to a supervisor's orders or blow the whistle to the town authorities. A closer look often reveals additional options.*
- e) *Well-reasoned: Make a reasonable decision. Arrive at a carefully reasoned judgment by weighing all the relevant moral reasons and facts. This is not a mechanical process that a computer or algorithm might do for us. Instead, it is a deliberation aimed at integrating all the relevant reasons, facts, and values—in a morally reasonable manner. If there is no ideal solution, as is often the case, we seek a satisfactory one, what Herbert Simon dubbed "satisficing."*

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We need to get informed about the options; like, we need to consider all realistic options. Initially ethical dilemmas seem to force us into 2-way choice do this or do that, either bow to a supervisors order or blow the whistle to the town authorities. A closer look often reveals additional options. So, next step is being well reasoned make a reasonable decision.

Arrive at a carefully reasoned judgment by weighing all the relevant moral reasons. And facts, this is not a mechanical process that a computer and algorithm might do for us. Instead it is a deliberation aimed at integrating all the relevant reasons facts and values in morally reasonable manner. So, if there is no one solution which is coming up we will go for a satisficing solution.

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Page 18/18

Code of Ethics – A solution for ethical decision making

Codes of ethics state the moral responsibilities of engineers as seen by the profession and as represented by a professional society.

Because they express the profession's collective commitment to ethics, codes are enormously important, not only in stressing engineers' responsibilities but also in supporting the freedom needed to meet them

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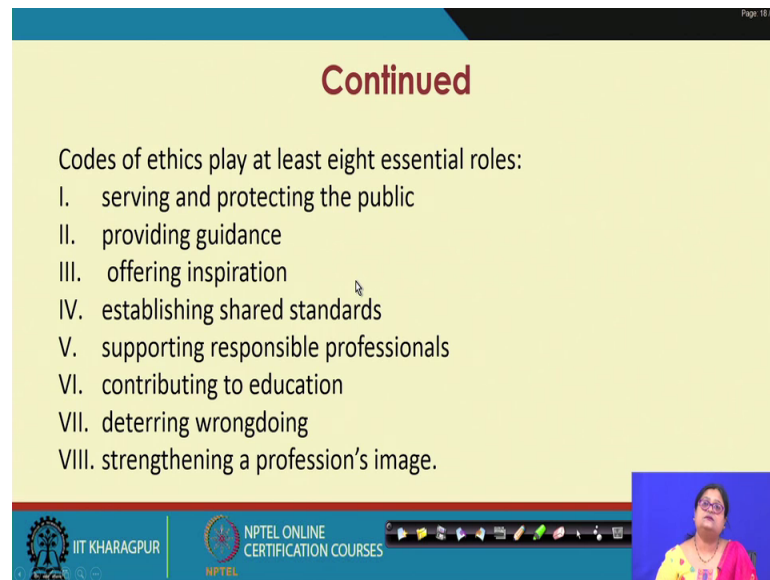
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Sometimes what happens? Like, codes of ethics or a solution for ethical decision making like, what we are found like the what we have discussed in the 3 ways is first sometimes if 2 things are coming in conflicting in nature. And if you find like their safety and security is there and then we are talking of the loyalty to of the employer safety and security is the primary choice.

Then you have discussed about the creative solution, where you have to try to find out the middle path so, that maybe if it is situations like this then whether we can work for a creative one. If there are more of moral dilemma happening and they knew the countries are happening conflicting situations coming up. Then we have to go further analysis at the factual level conceptual level and in the moral issues level. And also sometimes what happens? If there are codes of ethics to be followed, both at the professional codes of ethics and codes of ethics that the organizational levels are given, and certain conflicting situations are happening. The codes of ethics are guide help to us in solving this problem.

So, what we find over here? Codes of ethics are state the moral responsibilities of the engineers as seen by the profession, and represented by a professional society. Because they express professions collective commitment to ethics, codes are enormously important not only in stressing engineers responsibilities, but also in supporting the freedom needed to meet them.

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Codes of ethics play at least eight essential roles:

- I. serving and protecting the public
- II. providing guidance
- III. offering inspiration
- IV. establishing shared standards
- V. supporting responsible professionals
- VI. contributing to education
- VII. deterring wrongdoing
- VIII. strengthening a profession's image.

The slide is part of an NPTEL presentation from IIT Kharagpur. It features a yellow background with a blue header and footer. The footer includes the IIT Kharagpur logo, the NPTEL Online Certification Courses logo, and a small video inset of a woman in a pink and yellow sari.

And what we find it helps in serving 8 essential roles. Serving and protecting the public, providing guidance, offering inspiration, establishing shared standards, supporting responsible professionals, contributing to education, deterring wrongdoing, strengthening a professions image. So, in this discussion today; we have continued with our earlier discussion of understanding what are the ethical pillars of decision making; how we apply that in cases and how we understand the what are the issues in a particular case the which are of ethical dilemma. And we try to see it from the factual level conceptual level in the moral level.

And then, if we see like if there are conflicting situations happening; where like we are not able to decide maybe which one is the correct thing for us to do. There are certain priority issues like again health and safety of the public at large which is the paramount and prime importance which to given importance first, in these kind of things and generally it is very easy way to solve if it is having a conflict with any other conflicting demands. If in other situations there are conflicting demands, we can solve it by taking a middle way in a very creative way. If it is more complex and we see like we can do this issue level analysis at factual conceptual and moral issue level to find out how to solve this conflict.

And also we can refer to the codes of ethics of the profession which helps us as a guideline to find an answer to the conflict and conflicting demands and give a proper solution to it.

Thank you.