Ethics in Engineering Practice
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Lecture - 07
Central Professional Responsibilities of Engineers (Contd.)

Welcome back. Today we will continue with the discussion of the rights and responsibilities of engineers, which of the central rights and responsibilities. To have a recapitulation let us look back into the some of the important discussions we had on the last lecture.

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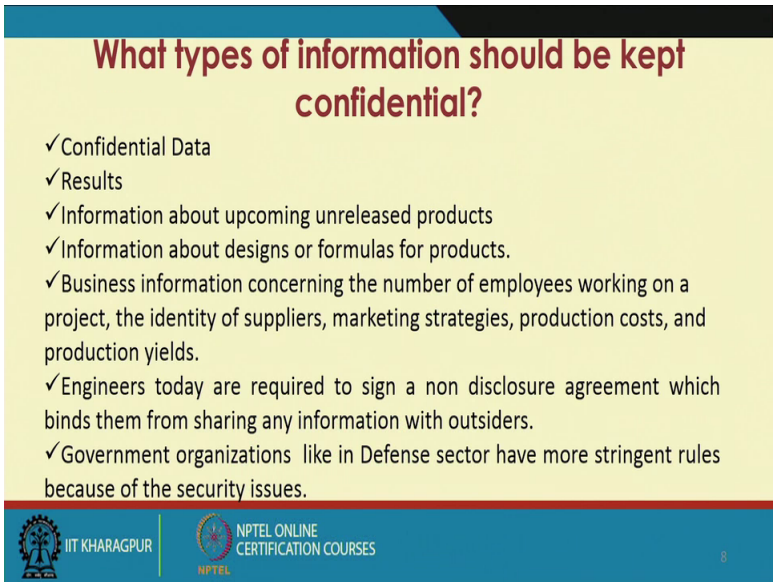

We discussed about the types of information that should be kept confidential like the confidential data results information about upcoming unreleased products information about designs or formula for products, business information concerning the number of employees working on a project, the identity of suppliers, marketing strategies, production cost and production yields.

Engineers today as a part of their job are required to sign a nondisclosure agreement which binds them from sharing any information with outsiders. Here in the last discussion we also discussed about the again the right for whistle blowing when that the engineer should go for disclosing some facts, and at what conditions and whom they should disclose it first to their insiders of the organization and then before dealing it with

outsiders. So, these the clause of whistle-blowing will also come over here, and government organizations like in different sector, they have much more stringent rules because of the security issues which are them.

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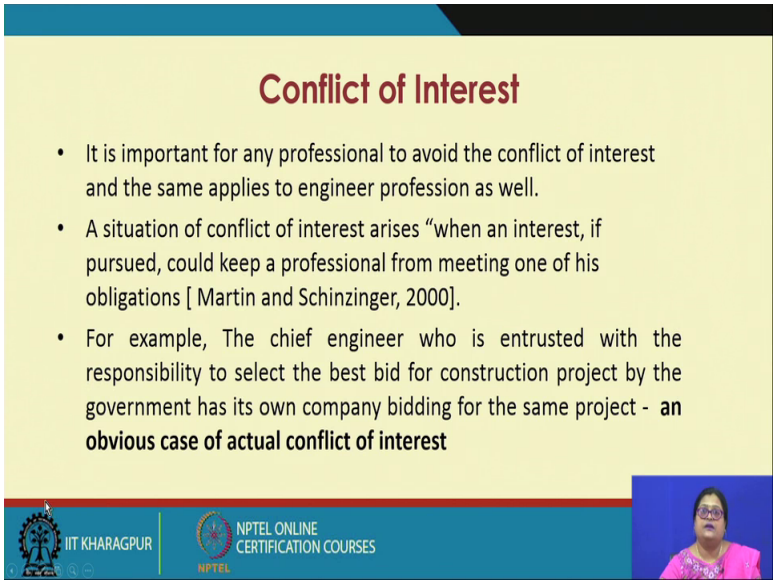

We also discussed about the conflicts of interest and here we find like the in the case that we discussed, there were also in the last session there were conflicts of interest. So, when conflict of interest happens when it is situation when an interest if pursued could keep a professional from meeting one of his obligations.

So, we discussed about the case if you remember in the last session like there is a I am in the decision making position for selecting of the suppliers and I also do have one company who is supplying the goods. So, in this case it is an absolute or like conflict of interest, which is an actual conflict of interest. Conflict of interest can be of generally three types. So, what we find there could be like you like you know like potential conflicts of interests and.

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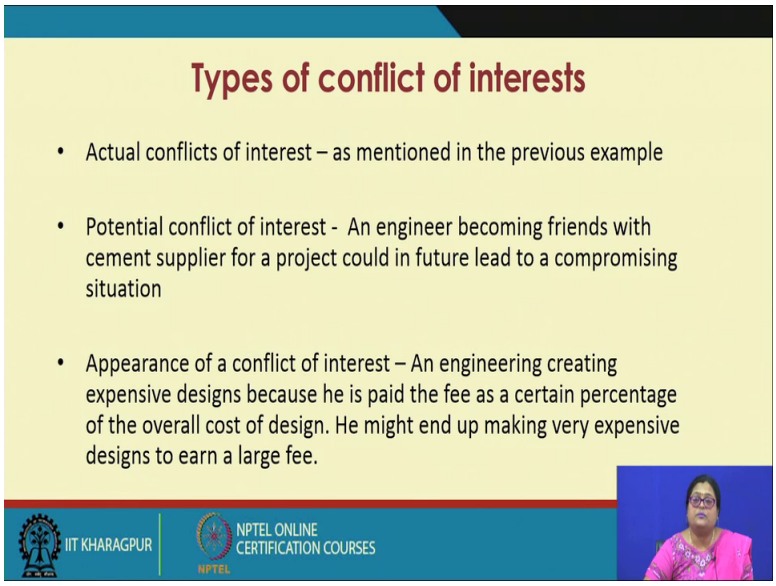

When I feel like there could be a condition where I am not directly involved as a supplier, but one of my friends who is a supplier I develop a friendship with one of the suppliers. And then, obligation comes in the terms of like should I select my friend who is the supplier or select someone who is really giving a good quality of cement or the supply that you want for. So, this is called a potential conflict of interest.

Then appearance of a conflict of interest is where like somewhere and engineering creating expensive designs a person who is creating expensive designs; because directly maybe he is not getting money, but what if what we can see like if he gets a percentage of the project as his fees, then the more expensive designs is going to give him better percentages.

So, in that case it is coming from where like appearance of a conflict of interest; where you find like I create expensive design in the expectation that I will get better percentages because my payment is based on the percentages of the certain percentages of the overall cost of the design.

So, here comes the conflict of interest and so, this is called appearance of a conflict of interest. So, generally we have three types; actual conflict of interest, potential conflict of interest and appearance of a conflict of interest. So, if these three thing we need to be careful about these situations and we need to take remedial measures about it so that they can be avoided.

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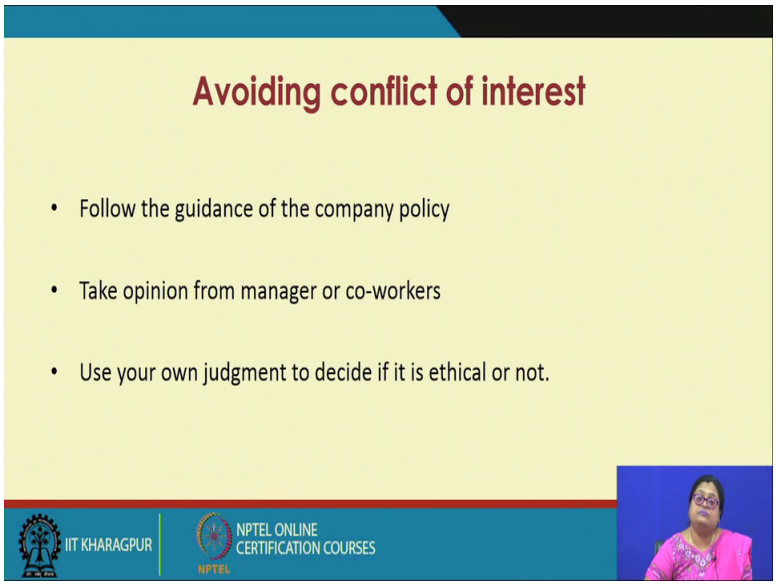

So, what we are going to discuss next is the avoidance of a conflict of interest and that we have already discussed to some extent in the last discussion like we follow the guidance of the company, the company policy if it clearly states about certain things, take opinions of the managers or coworkers what needs to be done or best is use your own judgment to decide if it is ethical or not. Like in if you remember in the last discussion we discussed about, if I find like I am in that position where I am going to select a supplier and I do also have a company who is supplying this type of goods.

Then if possible I will discuss with the managers and co workers and take the guidance of the company a policy if it is clearly stated and then refrain from taking any decisions, I will not participate in the decision making process of a of the supplier selection if possible or else I will not bid for it. There are two ways, either I do not involve myself in the selection process or else I do not participate in the bid means I do not engage in the process of supplying goods to the organization. Either way I can make myself out of this conflict. Next what you are going to this discuss in continuation with this type of situation is a situation of competitive bidding.

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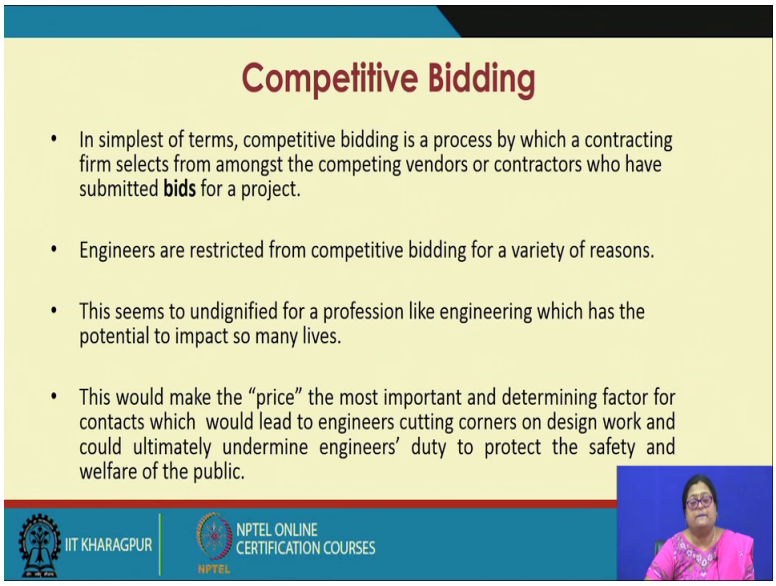

So, competitive bidding in its simplest term means it is a process by which a contracting firm, selects from amongst the competing vendors or contractors who have submitted bids for a project. The word competing vendors or contractors these words are very important words because the vendors have to compete for with their levels of performance and proficiency with different parameters, which are important for a quality service quality product and maybe after self service or the quality of the product. Where whatever it is they have to qualify through their performance level and there are pointers points associated with their (Refer Time: 08:08) how good they are in each of those things, and ultimately the best supplier gets selected based on their how good they are. And if it is an open competition then what happens we can there is a possibility of selecting the best among the best who have supplied or who have liked given their bids for a project.

Engineers here are restricted to from competitive bidding, this is also for a variety of reasons some of the reasons that which we have already discussed when we discussed about actual conflict of interest. Because if I am in a position to select the quality of the products given and then I lose my power of discretion, I lose my power of being objective to select the one who is performing best according to the quality of supply. If I do have some personal in interest ingrained in the goods and in terms of like who is supplying or if I am personally supply, then what happens it is a situation of conflict of interest. For that reason to help the engineers function in the best interest of the public at

large, engineers are restricted from competitive bidding for a competitive bidding process.

So, because whatever if this select a poor quality of goods, then it may affect the lives of so many people. So, otherwise what happens this would make the price most important and determining factor for a contracts which would lead to the engineers cutting corners to design work and could ultimately undermine engineers duty to protect the safety and welfare of the public. So, they are restricted from competitive bidding, because if price becomes a concern and not the goods quality of the goods it may affect life of people. So, they are restricted from competitive bidding.

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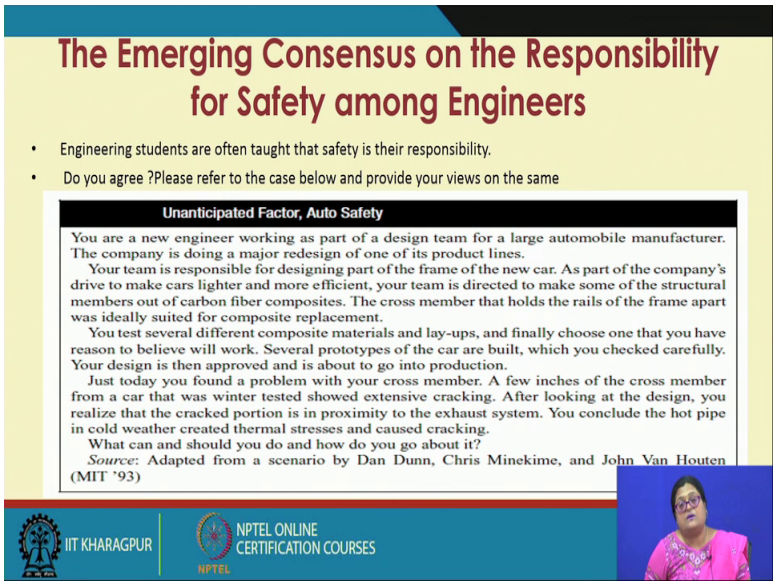

One of the important responsibilities which is coming up for the engineers and which is becoming important, very important day by day is the concept of safety amongst the engineers. So, these days engineering students are taught about the importance of safety as a part of their responsibility, and what we feel about this will be elaborated by the particular case that we see below. So, we will follow the case and we try to find out we will try to see explore, why safety has become a very important responsibility for the engineers and we will try to discuss about it and we explain it and try to see the importance of safety.

So, let us look into the case as given below, which is unanticipated factor or to safety. So, you are a new engineer working as a part of a design team for a large automobile

manufacturing company, the company is doing a major redesign of one of its product lines, your team is responsible for designing part of the frame of the new car. As a part of the company's drive to make cars lighter and more efficient, your team is directed to make some of the structural members out of carbon fiber composites.

The cross member that holds the rails of the frame apart was ideally suited for composite replacement. You test several different composite materials and lay-ups and finally, choose one that you have reason to believe will work. Several prototypes of the car are built, which you check carefully; your design is then approved and it is about to go into production.

So, till here what we find like you are a new engineer who are working as a part of the design team for a large automobile manufacturer. So, that is maybe you are a part of a great organization, big organization. The company is doing a major redesign of its product. So, you are a part of that team product lines your team is responsible for designing part of the frame of the new car. So, you are a part of the whole design of the frame of the new car; a part of the company's drive to make cars lighter and more efficient your team is directed to make some of the structural members out of carbon fiber composite. So, this word is important your team is directed to make some of the parts of the structural members out of carbon fiber composites.

The cross member that holds the rails of the frame apart was ideally suited for composite replacement. You test several composite materials and lay-ups this word is also very important you test several different composite materials and layups before you come to the car final decision. And finally, choose one that you have reason to believe will work. So, you have a reason to believe will work, but you are not yet tested it.

Several prototypes of the car are built, which you check carefully after that several prototypes are built which you check carefully your design is then approved and it is about to go to production. Just today you found a problem with your cross member. A few inches of the cross member from a car that was winter tested showed extensive cracking. After looking at the design, you realize that the cracked portion is in proximity to the exhaust system. You conclude the hot pipe in cold weather created thermal stress and caused cracking, what can and should you do and how do you go about it?

So, in this case if you are discussing about your responsibilities as a person who is concerned about safety, and if you have noticed that there could be points of dilemma, because your design has already been approved and you are going for and it is about to go for production. Now you have detected some safety issues and for a car which was like further in a car which was tested in a winter and then you find it is the further it is near the shows an extensive cracking, and near the exhaust system points of dilemma could be in this final stage if I cancel the design, what will be the cost impact on the whole company? Then they will not be able to meet their target if they want to launch their product, their car at a certain point of time if they promise the market that we are going to launch the new version of the car within this time frame. So, these could be your point of dilemma over here.

But still if you have observed these things, then what will be your responsibility at this point of time is to like it depends on like what is your rank in the organization.

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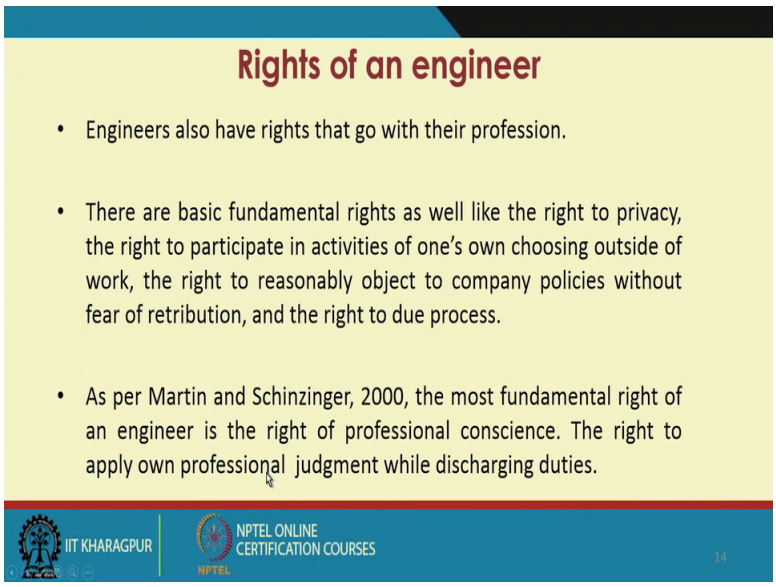

If you are a very junior member who had or as a part of the team, you should immediately report it to your team lead and then take it to the higher ups and then think even if it may cost something to the company now, it is much lesser cost as compared to the safety issues of the thousands and thousands of people, who may be using your final product.

So, these type of concerns, these types of responsibilities are very important responsibilities of engineers where we cannot compromise with the safety issues and it has to be a primary responsibility for the engineers. We have discussed about the responsibilities of the engineers, hand in hand with the responsibilities comes the rights of engineers.

So, now we are going to discuss about the rights of a of an engineer. So, there they have particular rights also engineers also have particular rights which goes with their profession. So, they these are very basic fundamental rights like the which is same as any other profession like it is the right to privacy, right to participate in activities of one's own choosing outside of the work, then the right to reasonably object to company's policies without fear of retribution and the right to due process.

So, like elaboration of this is like every person has a personal life and as a professional life. So, in a balanced way everyone has a right to privacy, and if it is not something my personal life if it is not going against or the professional ethics, then I do have to right to privacy. The right to participate in activities of one's choosing outside of work; outside my work I can choose to participate in activities which could be my hobbies or interests, but again we have to see whether we are compromising on our professional responsibilities or not.

So, these the key word in all these things are how to maintain a balance between whatever we are doing in our personal and professional life. Every person has the right to object to company's policies without the fear of getting punished or retribution and the right to due process. So, we can expect like we have a right to the due processes expected processes in the organizations.

As per Martin and Schinzinger, 2000, the most fundamental right of an engineer is the right of professional conscience, to right to apply own professional judgment while discharging duties. This is an unique right and the conscious right of professional conscience because the way we take engineering as a profession, it is a beautiful blend of knowledge judgment discretion responsibilities, which come up from the knowledge your concept the practice and responsibilities and this gives rise to a professional conscience. So, it is the fundamental right of the engineer is the right to the professional conscience, the right to apply own professional conscience while discharging duties is

very important that is why I told like in the case the word of importance was they were directed like if you can go back to the case, they were like directed to make some of the structural members out of carbon fiber composites.

So, like we if we look into the case at depth, we may debate about we may try to discuss about like when they were directed and if this is the proper material or not, whether it can withstand all type of weather conditions or not. And whether your professional conscience says yes to these type of designs or not and what is your conscience which directs you to do when you see these safety issues in terms of crack, and how you follow the judgment, how you take your judgment based on the your professional conscience.

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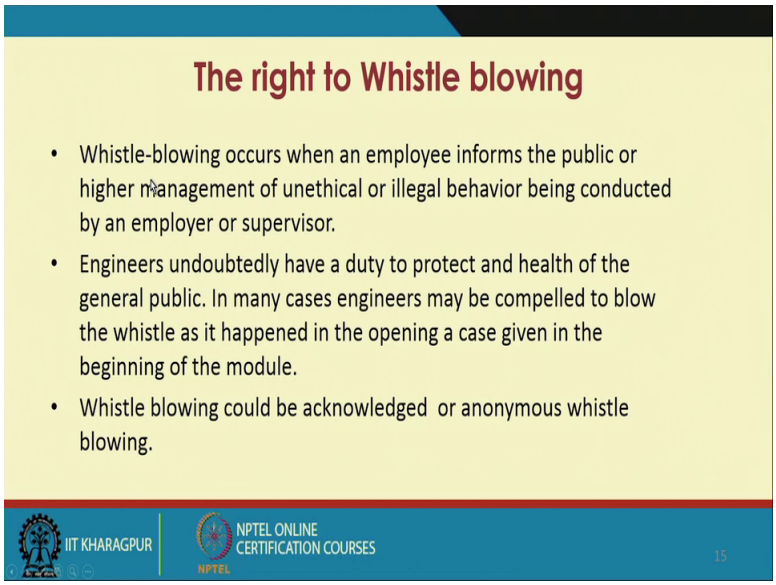

One of the important rights of the engineers are also the right to whistle blowing. As we saw in the BART case in the case that we discussed in the last lecture, it was like the three engineers they when they noticed some anomaly happening, they try to discuss about they try to sound they tried to voice about their concerns and they went through different channels they went to their immediate supervisors and they going to the board, and then the board went to the outside to the like public.

So, this the process that is followed is called whistle-blowing. So, every engineer because the primary concern the primary responsibility of the engineers are the health and safety and protection of the public at large, because they are designing certain things. The right to whistle-blowing is also very important right which they have if they notice

any discrepancy in the processes happening, which is deviating from the standard which may affect the safety issues of the public at large. So, we will discuss about the right to whistle blowing in details now.

The right to whistle-blowing, the whistle blowing occurs when an employee informs the public or higher management of unethical or illegal behavior being conducted by an employer or supervisor. Engineers have their duty to protect the health of the general public. So, in many cases engineers are compelled to blow the whistle as it happened in the opening case that we already discussed at the beginning of the module.

Whistle-blowing could be acknowledged or it could be anonymous whistle-blowing also. It depends on the culture of the organization, climate of the organization where they are whistleblowers are protected or not. So, that will determine whether it is an acknowledge whistle-blowing or it is your anonymous whistle-blowing.

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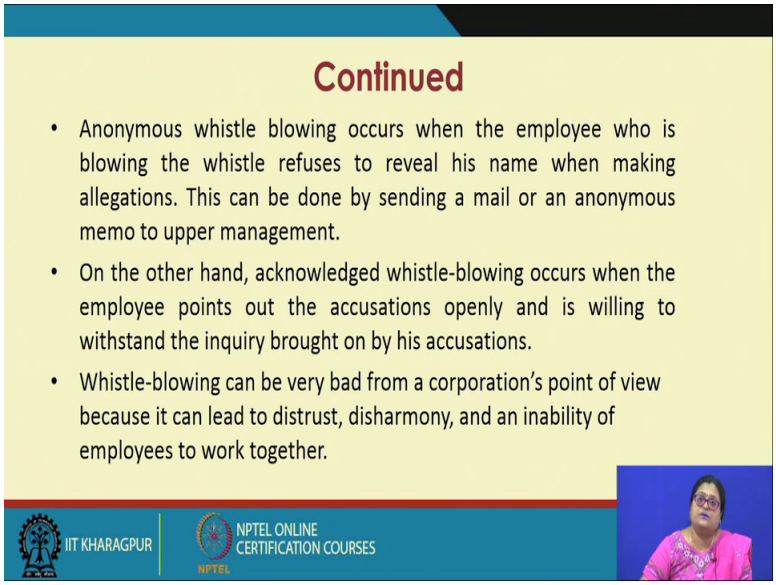

Anonymous whistle-blowing occurs, when the employee who is blowing the whistle refuses to reveal his name when making allegations. This can be done by sending a mail or an anonymous memo to the upper management. On the other hand, acknowledge whistle-blowing occurs when the employee points out the accusations openly and is willing to withstand the inquiry brought on by his accusation. So, he owns it takes responsibility of it, and he is like with facing the consequences of it, and moving further with the issues.

Whistle-blowing can be bad from the corporation's point of view, because it can lead to distrust disharmony and an in inability of the employees to work together.

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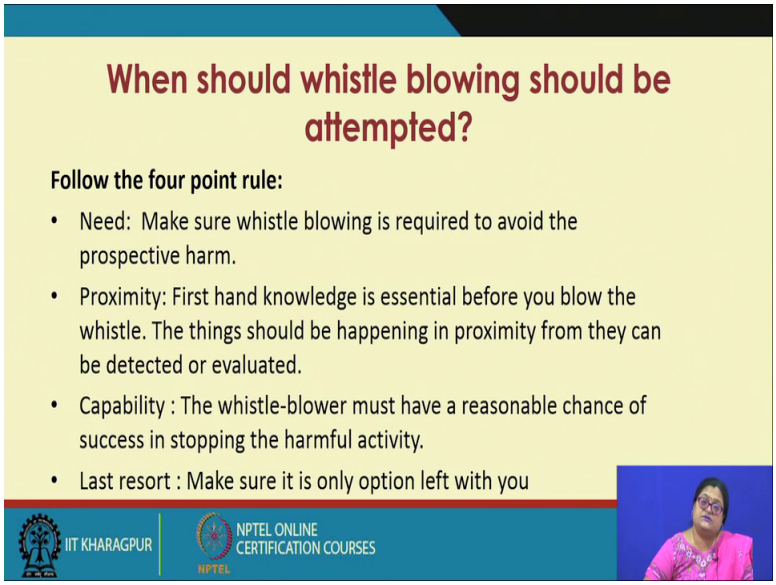

So, whistle-blowing because it is a very touchy sensitive issues, we need to decide also when we should go for whistle-blowing and when we should not go for whistle-blowing. If we are deciding for going for whistle-blowing then what are the proper steps involved in it how we should follow those steps, and what the organization can do about the employees whistle-blowing.

We will focus on those things now. So, what we will discuss now? When should whistle blowing be attempted what are the conditions when whistle-blowing should be attempted. So, generally what we do is. So, what we will discuss now when should with whistle-blowing be attempted.

So, generally what we do we follow the four point rule, let us see what are those things. Need: make sure whistle-blowing is required to avoid the prospective form. Proximity; firsthand knowledge is essential before you blow the whistle the thing should be happening in proximity from they can be detected or evaluated. So, we should not assume something and go for a whistle blowing first there should be a need the issue should be strong enough, it should have model intensity enough to qualify it to be an issue for whistle blowing. Second I should have the first of essential firsthand knowledge

before I go for a whistle blowing. So, they should be the things should be happening in proximity so that they can be detected or evaluated.

Then capability the whistle blower must have a reasonable chance of success in stopping the harmful activity. So, what is your position in the organization or what is the professional knowledge that you have, what is the expertise that you have, what is the collective strength of support of others that you have and how do you develop that strength will determine your capability. So, and your chance of success in stopping the harmful activity. And it should be made sure like whistle blowing that to when you are talking of whistle blowing to the outside world is the only option which is left with you and we have already tried through like reporting it to our may be team lead, then reporting it to the higher ups and moving these things up throughout organization and we have gone through this processes, waited for the feedback to come or actions to be taken and still if you find nothing has been taken care of, then as a last resort when maybe we can go for whistle blowing.

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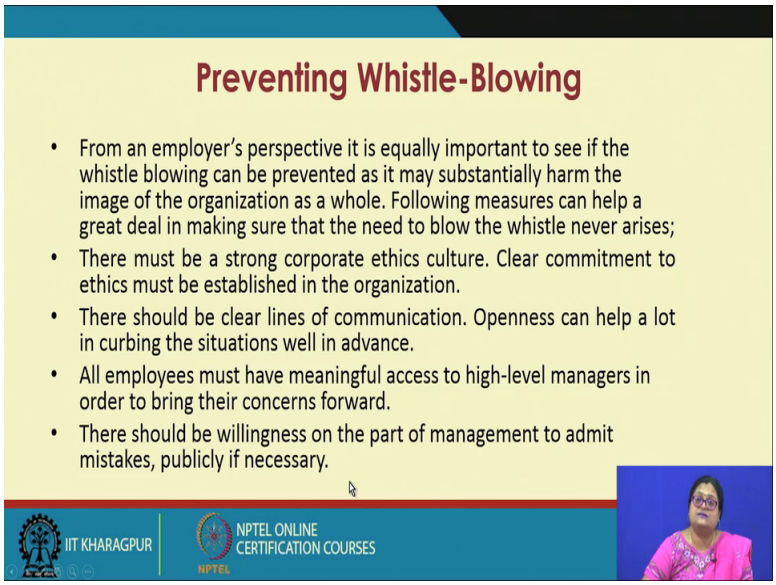

So, next what we can discuss is the preventing of whistle-blowing. So, because from the employer's perspective it is equally important to see like the how we can prevent this we should blowing or how to take care of the issues. So, that which are becoming of concern for the engineers, because it may potentially harm the image of the organization as a whole.

So, what when you are talking of preventing of whistle-blowing, we are not telling like we should create a threat environment in the organization so that people do not dare to blow the whistle it is not that. But we should be so, much careful in our efforts we should be so, much careful in the commitments that we make, we should much so, much we dedicated towards the objective that what the need for whistle-blowing should not arise.

So, first it starts with developing a strong ethics culture. So, there must be strong corporate ethics culture clear commitment to ethics must be established in the organization, there should be a clear lines of communication openness can help a lot in curbing the situations well in advance. All employees must have a meaningful access to high level managers in order to bring their concerns forward. There should be willingness on the part of the management to admit mistakes publicly if necessary.

So, if we are following these things the need for whistle-blowing may not even arise because people go for whistle-blowing only when their; people go for whistle-blowing only when they feel like their voices are not heard their concerns are not heard. So, if the organization gives an open climate good climate for communication where the higher ups are committed enough to the objectives of the organization, and they are taking enough responsibility, they are taking giving enough time to the junior members and giving a proper feedback to them, listening to their problems that taking. And, if these reported problems are genuine then taking proactive measures to correct those things and accepting mistake if some wrongdoing is done, and that to in public talks of a positive culture positive mindset of the organization which is ethically oriented it talks of a good ethics culture of the organization, and if that culture prevails maybe the need to whistle blow will not arise at all.

So, in this chapter in this discussion we have covered about the major central rights responsibilities and rights of the engineers, and what we can say like if one of the these rights and responsibilities go hand in hand and we have to make a balance of these rights and responsibilities so, that we can address our duties in a proper way.

Thank you.