Infrastructure Finance
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Lecture - 30
Risk Management II

Welcome back to this course on Infrastructure Finance, this is lecture 30, we will continue our discussion on Risk Management that we have been looking at for the last couple of lectures. And we have looked at various types of project specific risk, and we will look at some more of the project specific risks in this lecture as well, but before we actually do that let us try and discuss some of the questions that we had at the end of the previous lecture.

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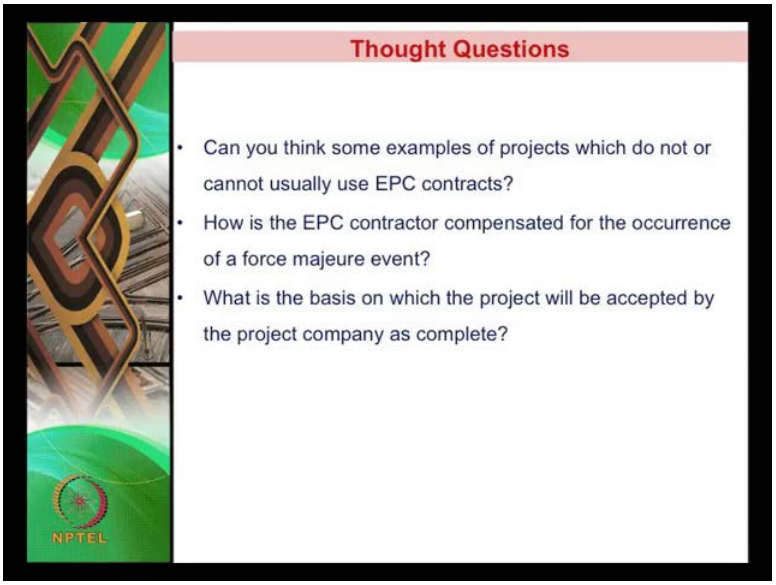

To recapture we had three questions at the end of the previous lecture, question number one was can you think of some examples of projects, which do not or cannot usually use EPC contracts. What is the main feature of EPC contracts? The main feature of the EPC contract is actually to look at a fixed price contracts. So, if there are situations where it is not possible to find out, how much exactly it is going to cost to construct or develop the project at the outset.

Then it is very difficult to go, it is very it is going to be very difficult to actually use an EPC contract in those instances, can you think of any situations where it is going to be

very difficult to estimate, what is going to be the total construction cost. See, there are several examples, if you come to think of it specifically if you look at industries such as mining, oil and gas, so on which involves, you know extraction of resources from the ground.

It is going to be very difficult to estimate how much it is going to actually cost to develop the develop the project site. So, before we actually let us say start developing the project based on some geological studies we get tentative information in terms of how much is the reserves that are there in the project site. And we also probably know in terms of how deep it is and we could probably also know information in terms of what is the geological composition of the drilling site.

But, then when the project starts happening when the actual drilling starts the conditions could be very different, as compared to what was originally estimated for. We may not have the required amount of oil we may not have at the required depth, it may probably be much deeper; and the geological composition might be very different to what we had actually initially thought of to be.

So, how do we actually do a EPC contract, if an EPC contract is actually going to be put for this kind of a situations, then the EPC contractor is going to bear enormous amount of risk which he may not be in a position to absorb. So, under the circumstances if the situation turns out to be very adverse, then the EPC contractor might actually drop the project and run away.

So, therefore, it may not be advisable to structure a construction contracts in these sectors on an EPC basis or if it is going to be done construction contract, it should not be in a turnkey basis. It should largely be on the basis of cost plus, in terms of how much actually does it cost to develop the project site. And then an additional amount to provide for the return for the EPC contractor, but whenever we are using a cost plus kind of a contract.

Obviously, there has to be a lot more closer monitoring and supervision of the contract to ensure that the contractor does not overcharge, the contractor does not actually the contractor is probably functioning as efficiently as he would have been in the turnkey contract. There could be other instances as well where EPC contract might not be the best thing to go for example, if you are talking about the situation where the demand

increase, over time and because of the increase in demand we might have to make additional investments and so on.

So, if the investment is going to be made over a period of time, and if the demand is actually going to change over a period of time, then an EPC contract might not be most appropriate option. An example, of this will be telecommunication sector, so in the telecommunication sector the demand increases over time, and it might not be worthwhile to actually put in all the investment upfront, because the network availability is going to the need for network is going to increase based on the expansion of the network.

And all the expansion of the network is not going to be done upfront, so we may actually need to start investing in network expansion over a period of time. And in that circumstances, we may not really know what is going to be the fixed cost of entire network expansion, because of the question of time and, because it is also a question of how the demand is going to pan out, during the next coming years.

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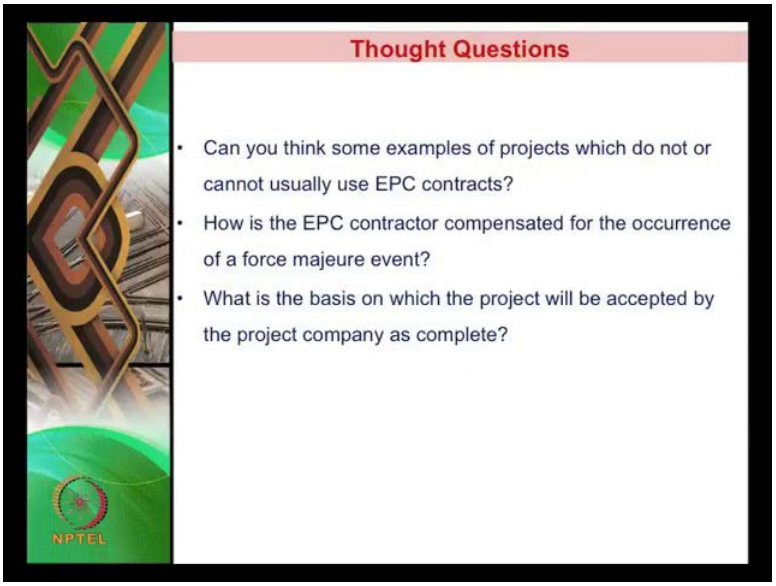

So, EPC contract is the most commonly used contract to mitigate the construction risk, but we have to be aware that it there are situations, there are sectors where it is not possible to have EPC contracts. The second question that we had was how is the EPC contractor compensated for the occurrence of a force majeure event, first let us spend

some time to understand what is a force majeure event, and then we will look at how the contractors are going to be compensated.

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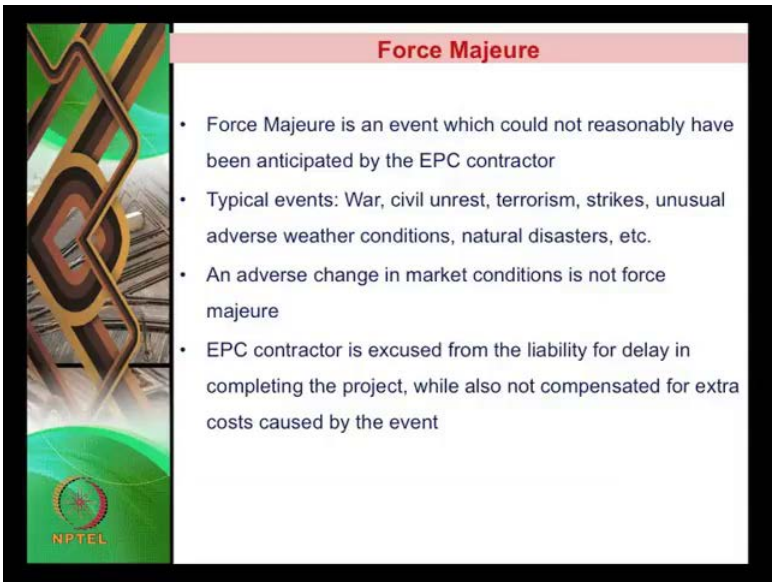

To put a simply what is a force majeure event, force majeure event is an event which could not reasonably have been anticipated by the EPC contractor. See for example, when the EPC contractor makes a bid, and obtains a contract he accounts for various uncertainties. And he mitigates several of these uncertainties in a way in which he is you know he is aware of he is capable of, but then there are some risks which you know cannot be mitigated simply because of the fact that the EPC contractor, cannot anticipate the occurrence of these events, what are some of these events.

So, it could be let us say, you know war, civil unrest or terrorism, strikes unusual adverse weather conditions, so today we actually see several unusual, weather conditions happening, you know all of these things cannot be predicted at all. Then that could be natural disasters, so it could be like you know earthquakes, hurricanes, floods and all of those, so there are all typical events which it is going to be very, very difficult to anticipate or predict.

So, whenever these events occur because of the fact that these are beyond the control of the EPC contractor any delays that occur, as a result of such force majeure events the compensation for that is not forced on the EPC contractor. So, if the project is delayed, because of floods and there could be a delay in the completion of the project. And

whenever there is a delay in the EPC contract, there are some damages there are some compensation that the EPC contractor has to pay, but we have to really analyze why has there been a delay. If there has been a delay, because of a force majeure event then the compensation is not enforced on the EPC contractor.

So therefore, becomes very important at the outset to identify, what are the force majeure event in the EPC contract, because it will be the tendency of the EPC contractor to push as many uncertainties under the clause of force majeure. And from the part of the project company they will try and limit, what could be called as force majeure events. So, to avoid difficulties in resolving disputes in terms of what is a force majeure, it is very important that there is a clear definition made or what all consists of force majeure at the beginning of the contract as such.

There is one example of what does not constitute force majeure for example, there is an adverse change in the market conditions, this is not considered as a force majeure event. So, an adverse change could be changes in prices, so we have seen several instances where in between the construction the cement prices sky rocket tremendously the price of steel increases.

So, these increases might not have been anticipated by the EPC contractor, so sometimes EPC contractor comes back to the table, and then says that the price increases has been beyond what has been expected, so therefore he needs to be compensated the contract terms needs to be revised and so on. But, generally the rule is that all such adverse market conditions need to have been modeled by the EPC contractor, and then mitigated appropriately rather than coming back to the project company.

So, it can be assumed that any adverse market conditions should not be considered as a part of the force majeure, so when a force majeure event happens, there are two things that can happen first thing is that there could be a financial loss for the EPC contractor. For example, there is a structure that he has constructed because of floods or earthquake the structure could have been damaged, and you will have to go back and do the structure all over again.

So, in this case there is actually additional financial cost involved on the part of the EPC contractor, the second is there can be a delay in the construction. So, construction has already been complete, because of it is been damaged the construction has to be done all

over again, and this can take an additional time, which can lead to a delay in the completion time.

So, whenever the this kinds of occurrences happen, the EPC contractor is excused from the liability for delay in completing the projects, so if there are any liability payments associated with project delays, then the contractor is excused from making this payments. If it is a force majeure event, but at the same time the contractor is not compensated for additional costs that are caused by the event. Why is the contractor not compensated for the additional costs, because the contractor as a part of his risk management process should have insured for some of these force majeure risk.

So, for example, the contractor should have ensured for the occurrence of the earthquake, the contractor should have insured for occurrence of fire, and insured for occurrence of fire and insured for occurrence of floods and so on and so forth. So, therefore, whenever these kinds of events occur, the damages are going to be compensated by the insurance firm and therefore, a project company need not compensate the EPC contractor. If the EPC contractor has not taken insurance for these kinds of construction risk, then it is a very bad risk management for on the part of the EPC contractor, and he will have to bear the risk of such bad risk management practices.

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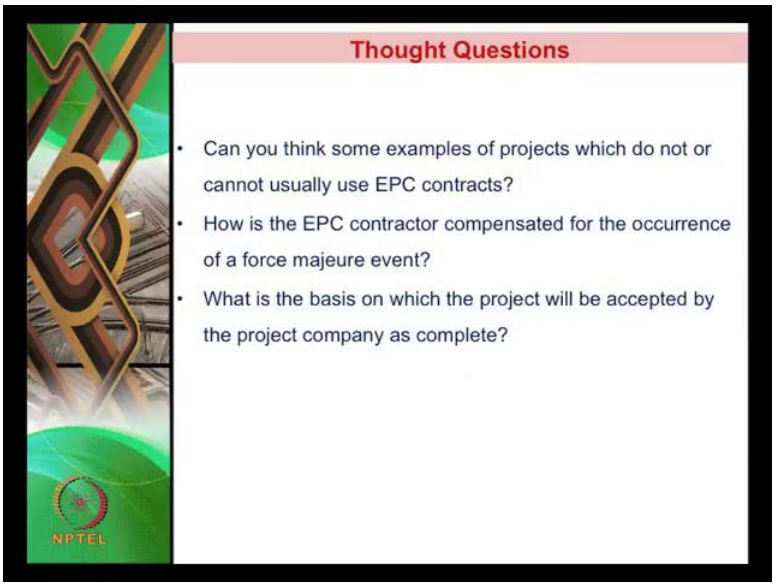

The third question that we discussed was, what is the basis on which the project will be accepted by the project company as complete, so remember in an EPC contract an

important milestone is project completion. So, the question is how do we decide, when the project is complete, what are the various steps involved in certifying, that the plant certifying that the project is complete and it can begin operations. So, let us spend some time discussing the modalities of going through project completion process.

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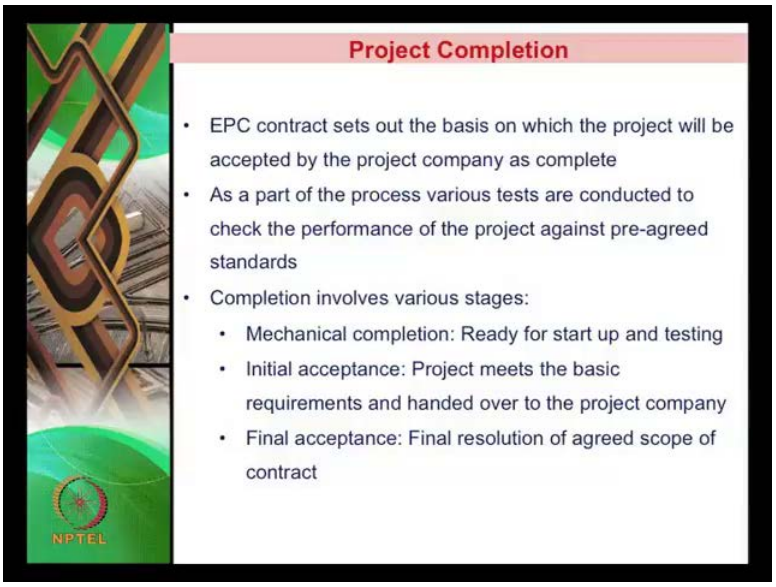

So, first of all the EPC contract clearly defines, the basis on which the project will be accepted by the project company as complete, so there could be various do you actually accept the project as being complete, after it has been constructed or after it has been tested. Do you accept the project as complete, if a certain percentage of works has been done, and the plant can operate or do you accept it as complete only when all the projects has have all entire project has been completed as per specification.

How do you actually do performance tested is a plant deemed to be complete only after the testing is fully undertaken, so there are various you know ways in which you can look at completion. And each and every EPC contracts sets out clearly the basis on which it is going to be determined, how the project how the project is deemed to be complete. The first step is as a part of determining whether the project is complete or not, various tests are being conducted to check the performance of the project against the pre agreed standards.

Is the plant performing as per what we have agreed upon, that is something that has to be tested before we can actually determine, whether the plant is complete or not, but

generally if you look at it the completion involves, you know by in large three stages. The first stage is your mechanical completion that is the project is ready for startup, and you can actually do the testing remember for the testing to be done, all the works should have been complete and the plant should be in functioning mode, so that the testing can be done.

So, mechanical completion is a milestone which indicates that the project is ready for startup, and the project company can go ahead and do the testing, so the outcome of the testing process will determine whether the project is complete or not. The second step is your initial acceptance, so initial acceptance is where the project meets all the basic requirements, and it can be handed over to the project company.

So, after the initial acceptance the project can actually function, the project may not be hundred percent complete, but the plant is actually in a functioning condition as per the pre agreed standards. So, when we reach a situation like this, it is considered to be in initial acceptance, and then comes the final acceptance any pending works that are need needed to be completed as per the EPC contract, after the initial acceptance had to be completed before the project can be certified as a final acceptance.

So, this is a normal three stage process well it is very important to understand an important part of the initial acceptance process is to settle any liquidation damages that may arise as a part of your EPC contract. So, let us first understand what are these liquidate damages remember the initial acceptance happens after the testing is complete, so the testing determines whether the project is going to perform as per pre agreed standards.

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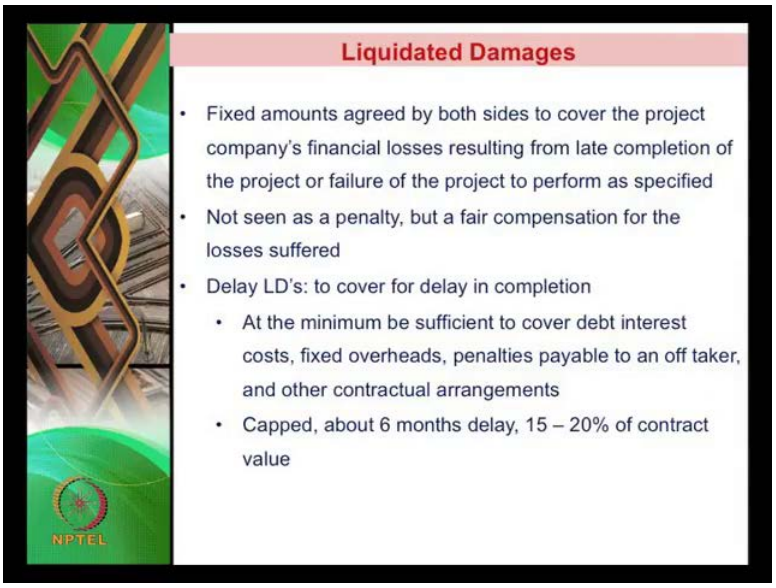

So, liquidated damages are essentially fixed amounts that are agreed by both sides, that is the project company as well as the EPC contractor, to cover for the project financial losses arising from either late completion of the project or to failure of the project to perform as specified. So, remember the when the project is completed late a part of the revenues are lost or the part of the revenues are delayed, so this creates some kind of financial loss for the project company, and the project fails to perform as per as per agreed standards.

So, initially the agreement was the project should have the capacity of three hundred mega watts, but upon testing you find that the project actually can function only at a capacity of 280 Mega Watts. So, there is a short fall of 20 Mega Watts. So, this actually can lead to a shortfall in revenues, and therefore the project company needs to be compensated for this loss of revenues.

Why, because the loss of revenues can actually lead to multiple implications, for the project company it can actually lead to implications in terms of debt service coverage ratios, it can lead to implications in terms of the quantity of amount that is been guaranteed under the off take contract and so on, and so forth. So, there are plenty of financial implications for the project company, and therefore they need to compensated for this kinds of shortfalls.

So, liquidated damages help the project company to recover these kinds of losses, as a result of delays or as a result of shortfalls of performance, but by in large it has to be viewed as something a fair compensation for the losses, but not necessarily as a penalty. You see remember EPC contractor tries to implement the project in good faith, but because of, so many reasons a project is very large it could be complex as well because of all these reasons.

And the fact that EPC contractor himself is learning from the entire project management process. that can be slip offs in terms of delays that can be slip offs in terms of performance standards and so on. So, if any of those occur then the EPC contractor is willing to compensate for the losses of the project company suffers, so it should not be seen as a penalty as a poor performance by the EPC contractor, but it should be just seen as what it is, just as a compensation for any loss that a project company might suffer.

So, liquidated damages can be from any of the following, it can be due to delays or it can be due to poor performance, so whenever we are talking about delays the liquidated damages for delays is essentially to cover for the delay in completion. So, at the minimum the liquidated damages under this clause should be able to cover for debt interest. Another, fixed overheads remember the project company would have recruited people assuming that the project will start functioning, but if there is a delay.

Obviously, the company needs to be paying salaries for these people, but at the same time might not be getting any revenue, so that is an example of an overhead. So, fixed overheads and if the company has actually signed an off taking agreement, and if the off taking agreement provides for supply of power on a agreed date. If there is a delay; obviously, the project company is not able to generate power on the agreed date, and that results in a penalty payment to the off taker.

So, the liquidated damage should be in a position to cover up for the penalty payment to the off taker, there can be other contractual arrangements as well. So, these liquidated damages should be in a position to account for all the losses, financial losses that the project company suffers, because of the delay in the construction process. So, normally there is a cap, there is a ceiling for such liquidated damages, usually it is about 6 month delay, people are willing to you know the EPC contractor can compensate for up to 6

months delay by paying liquidated damages, and in terms of value it will be about 15 to 20 percent of the EPC contract value.

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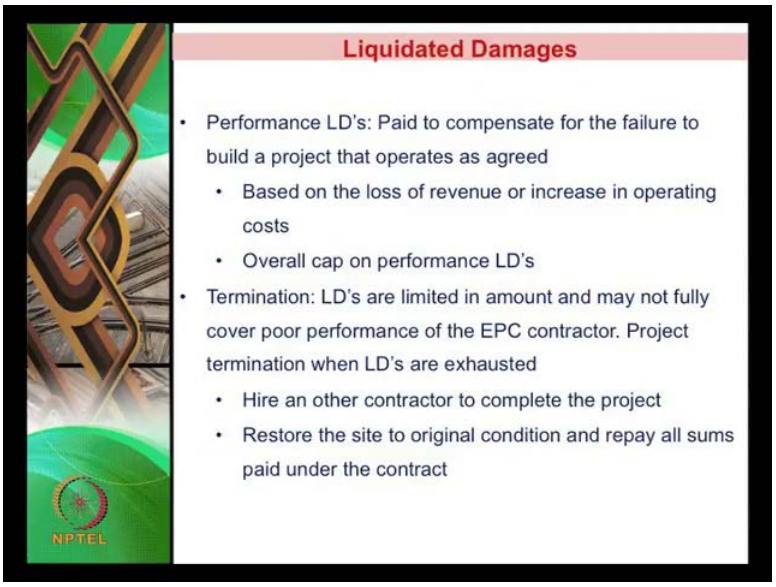

So, the next category of the liquidated damages is due to performance is to compensate for the failure to build the project that operates as agreed. So, like you talk about if the power plant generates lesser capacity of power as compared to what it was originally estimated, then there is a short fall in performance and this is basically a performance liquidation damage. So, how is a performance liquidation damage calculated, so it could be based on a loss of revenue or increase in operating cost.

So, performance can be anything, performance can be in terms of power generation, performance could be in terms of efficiency, that is how much of fuel is needed to generate certain amount of power. So, initially if you say that you need certain amount of efficiency, but finally you find that the efficiency is lower so; that means, you will have to burn more amount of fuel to generate the same amount of power.

Then obviously, the power project company will have to purchase more fuel, and it can increase in operating cost, so therefore the performance l d should be to cover for either the loss in revenue or for the increase in the operating cost. So, like there was a cap on liquidation damages in case of delays, there is also a cap on performance, it is not that the project company will tolerate and receive liquidation damages for all variations of performance.

What happens? If the delays exceed the maximum that has been indicated under the delay liquidation damage clause or the performance is below par, that it cannot that it exceeds the overall cap on performance ((Refer Time: 22:31)). Then in those cases the project company has a right to go ahead and terminate the EPC contract, because the liquidation damages are not adequate to cover for the financial losses, so project company goes ahead and terminates the EPC contract.

The LDS are not adequate to cover up for the financial losses, so whenever there is a termination what happens. So, the project company goes ahead and hires another contractor, and the EPC contractor is expected to pay the additional cost incurred in the hiring of the new contractor.

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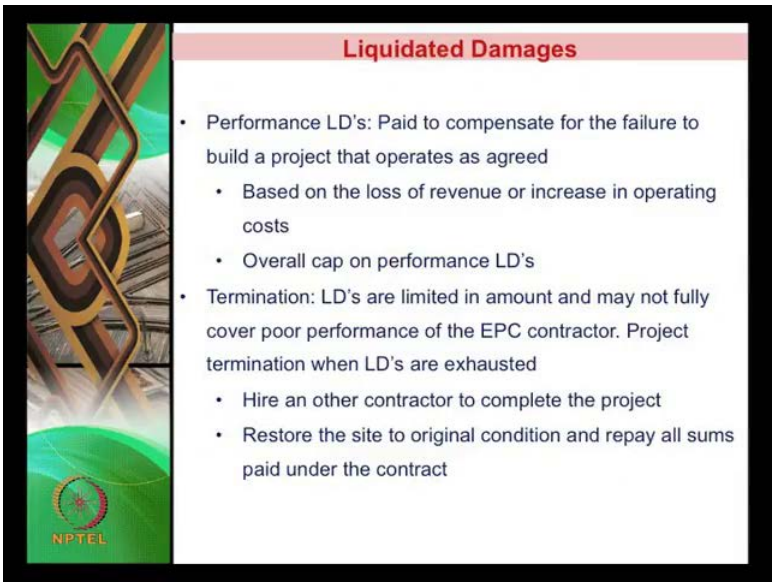

So, the EPC contractor provides various bonds and guarantees in securing the contract, so whenever the contract is terminated, all these bonds and guarantees are utilized by the project company to meet the cost of new contractor that is going to be hired for completing the project. Second in the case of termination the EPC contractor is expected to restore the site to the original condition that was given to him, and is also supposed to return all the payments that are received under the contract.

Now, these are all issues that is going to be very difficult to enforce for example, what happens if the EPC contractor does not have the with all, to pay back all the amount received under the contract. What happens he has done, so much of development that

demolishing all of it and restoring the site, in the original condition is going to be very, very costly and wasteful of, so much of productive investment. So, therefore, the most practical way of handling, termination is to hire another contractor and ensure that the project is complete, and the existing EPC contractor pays for the cost incurred in completing the project.

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Now, let us look at the next category of project specific risk, so we talked about construction risk in the previous risk, now we will talk about supplier risk. So, we will start up with the three questions that we had in the case of construction risk, as well how does it affect the project, when does it affect the project, and how is it mitigated So, how does it affect the project, what do you actually mean by supply is supply of raw material, supply of fuel, supply of any other inputs that are needed to operate the project.

So, when there is any disruption, when there is a shortfall in supply; obviously, the project cannot run, if there is a shortfall in fuel, then the power generation cannot run, if there is shortfall in crude oil then the petroleum refinery cannot operate. So, essentially the raw materials, and other inputs that are needed, if they do not come on time or if the supply is disrupted the project cannot run, and therefore the project cannot generate revenues therefore, the project cannot service debt.

So, there is a lot of cascading chain reactions that actually happen, so it is a very, very big risk, and therefore the investors in the project specifically the lenders want to ensure that the supplier risk is adequately mitigated.

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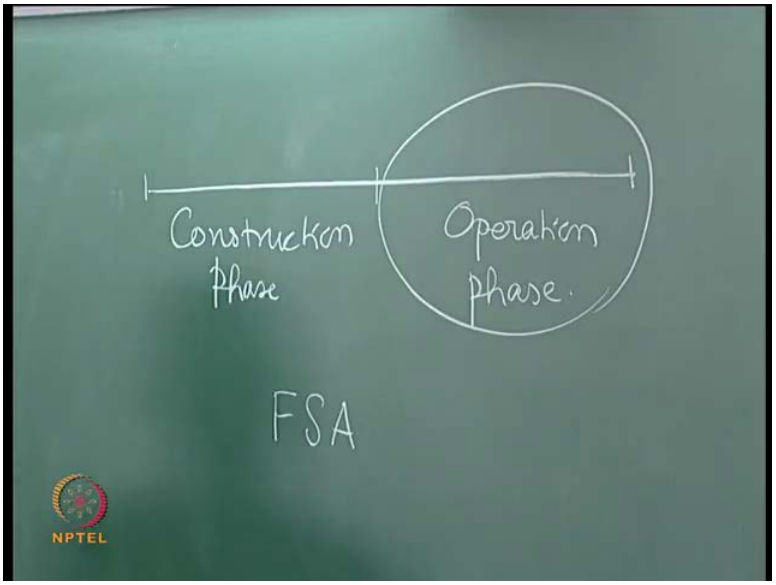

And when does it actually affect the project, so if we actually see the project has been of two phases, so you have actually have your construction phase, and then you have your operations. So, when do you need inputs, when do you need fuel, when do you need raw materials, so you need all of these to operate the project so; that means, the supplier risk becomes relevant when the plant is in the operation phase.

So, in terms of timeline supply risk is critical when the plant starts to operate, so how is it mitigated what kind of mechanisms that we actually use to mitigate. So, one way of mitigating the supply risk is to sign a long term fuel or input supply contract, so sign a long term contract, it is also called as your fuel supply agreement, FSA in the case of the power sector.

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There are could be other raw materials, and whenever they are involved it could be as input supply contract like we talked about petroleum, crude petroleum refinery, but why is supply risk is very important. If you look at operating cost fuel cost or raw material cost is a very, very important part of the operating cost, so when you look at project construction phase the construction cost is a very important part.

So, therefore, we looked at construction risk first, when the project is in the operation phase the raw material cost and the fuel cost is very important, so therefore we are looking at supply risk during the operation phase. So, what are the essential features of the supply contract, you know there are some of the basic features that the input contract should meet the duration of the off take contract.

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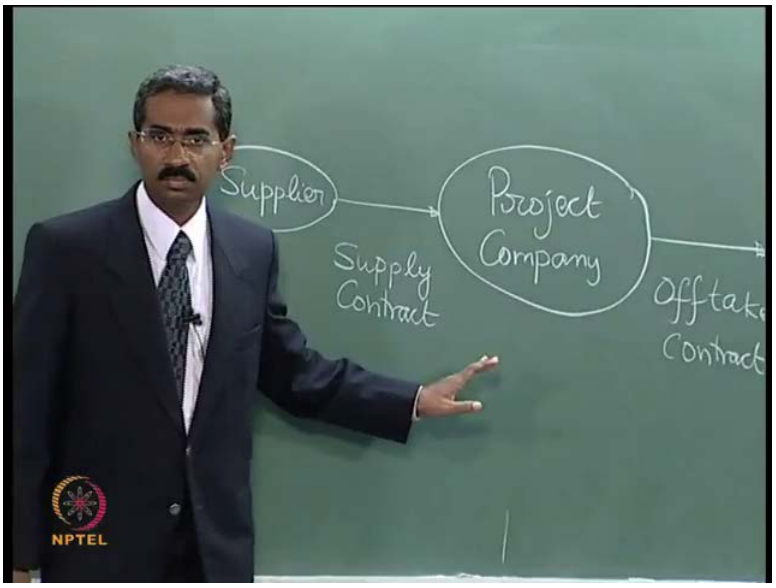

See for example, you have a project company, and then you have what is called as your purchaser, who purchases the products or services generated by the project company, and then there is a supplier, which is your project company. So, between the supplier and the project company is your supply contract, here it will be your supply contract, and between the project company, and the purchaser is your off take contract.

So, we will talk about off take contract in a while, so the first guideline is that the supply contract should be in line with the duration of the off take contract. So, if the off take contract is for 15 years, and if the supply contract is only for 8 years, then what is the guarantee that fuel supply will be available for the remainder of the off take contract period. So, if the power project is not able to, you know generate and provide as per agreed terms in the off take contract, then there will be penalties.

So, to ensure that there is appropriate risk management strategy, to the supply contract should be in parallel to the off take contract is for 15 years, we should probably also have a supply contract for 15 years, so that is a very important. Second as far as the lenders are concerned, the lenders are more bothered about the viability of the project till the duration of the loan, till the duration of loan repayment.

So, from the lenders perspective they will look at the supply contract being in place at least for the term of the debt, if the debt term is 10 years the lenders will be concerned that the supply contract is less than 10 years. So, they will look for a supply contract that

at least ensures that there is adequate supplies, and there will be adequate generation of revenues at least the loan is being repaid.

So, what are the essential or features of this specifications of this supply contract, there is specifications generally includes the following, one is the quantity of supplies that are needed. It could be in terms of volumes, it could be in terms of you know Kgs and so on, so the supply contract indicates how much of supplies will be provided, second at what quality will it be delivered.

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So, if it is a coal, how much will be the proportional, Sulphur and how much will be the impurity or how much will be the density of crude and so on, and so forth. So, both the quantity and the quality are important specifications that will be there in the supply contract now; obviously, if the project company is not in a position to, if the quality is not up to standard.

Then the project company can go ahead and not accept the supplies under the contract, so whenever there is a shortfall in terms of volume or in terms of quality, then there are appropriate compensation mechanisms, that are there between the project company under the input supply contract.

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On what basis is the inputs going to be supplied, so the supply basis, first thing input supplies are purchase from an exclusive supplier. So, let us say if the project company is in power generation, and if it wants to purchase coal, then all the coal needed for this project is purchased exclusively from one supplier. Say for example, it could be coal India limited or it could be you know, if it is being coal is being imported it could be from a particular source.

So, it is actually governed by you do not really have many suppliers, now the supplier can actually have many subcontractors, but then the contract is with one single supplier, so there will be one exclusive, from where the project company is going to get all the supplies. So, the second is from where will the supply start, supply is essentially supposed to start on the date of commercial operations, commercial operation date it is called a COD.

The supply, contract will clearly specify that the supplier should be in a position to deliver the supplies on the estimated date of commercial operations. So, then the supplier will have to make his own plans, so that he is ready to provide the supplies, when demanded as per the date of whenever the plant is complete.

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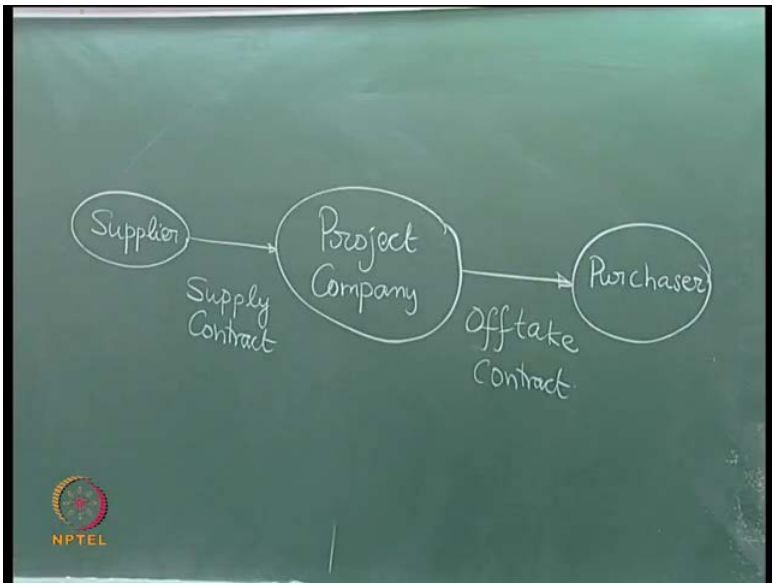

If there is any delay, in the completion date and the date of operations, therefore the project company will then have to make some compensation payments for the supply contractor, because the supply contractor would have made some investments. And if there is a delay he needs to be compensated for this delay, so therefore the project company will have to pay some damages or compensation to the supplier, but how will the project company pay these damages. If there is a delay in project construction, the project company is going to get some liquidated damages from the EPC contractor.

So, part of his liquidation damages could be provided to the input suppliers, so that is how the supplier delays are being compensated. So, volume of supplies is also linked to the projects output, so how much fuel is needed it also depends on how much is agreement between the purchaser and the project company. So, if the agreement increases or if the agreement varies as per pre decided estimations, then the supply contract should also vary, as per the projected generation with the purchaser and so on.

So, therefore, there has to be a lot of parallel provisions between the off take contract and the supply contract, remember supply contract has several provisions of the off take contract. Simply, because from the project company this is a supply contract, but as far as the supplier perspective is concerned this actually is an off take contract, because there is a purchaser for whatever he is supplying. So, therefore, you will find many similarities

between a supply contract and an off take contract, what are the different types of supply contract.

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Broadly, can be classified into 3 categories one is your take or pay contract, so according to the take or pay contract, the project company is obliged to take a fixed amount of supply from the supplier. If he is not in a position, if he does not need then he should actually take the supplies, and sell it in the open market. So, it essentially take or pay either you take it and pay, it or even if you do not take, it you will have to pay it, so there is a guaranteed off take of supply from the supplier.

So, the take and pay contract essentially allows for payment depending on how much is actually being take, how much is actually being consumed. So, you pay only for whatever you purchase, there is no guaranteed amount in a take and pay contract, but you also find that in most instances there is what is called is the floor and the ceiling. So, there is a minimum amount that you will have to purchase, and there is a maximum amount which a supplier can provide. If it exceeds then the project company will have to go ahead and make the purchases from the open market or from any other supplier.

And then the third is the tolling contract, so in the tolling contract the supplier provides the necessary supplies to the project company, for it to be turned into a product, and for making the project available. So, that the supplies can actually be utilized by the project company, there is a fee paid by the supplying company. So, a tolling contract does not

involve a purchase of supplies from the supplier, on the other hand a tolling contract involves payment of fees for making the project available to utilize the supplies.

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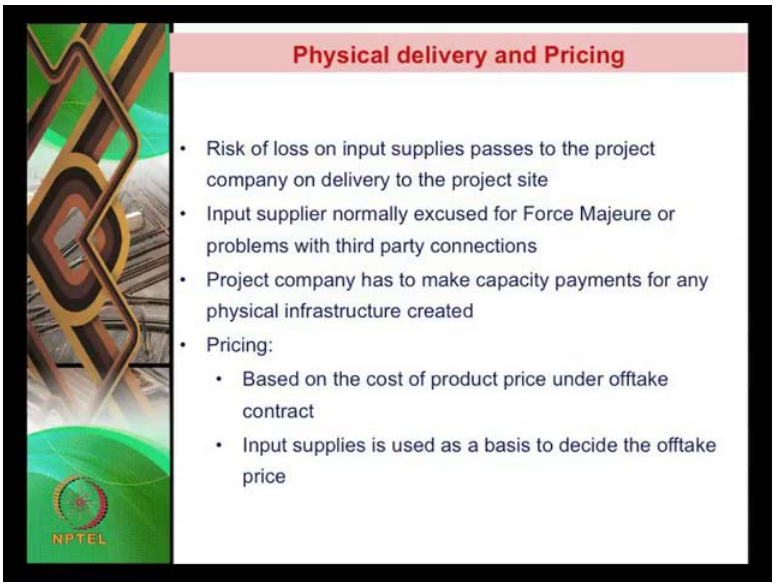

Physical delivery and pricing, so after the fuel has been delivered to the project site the risk of loss can be it could be, because of theft or it could be, because pilferage or it could be because of some simple natural causes like operation and so on. So, any risk of loss of input supplies, after reaches the project company is on the project company, and the fuel supplier is not responsible for any risk of loss, any risk of changes in quality and so on, after the fuel has been delivered to the project site.

So, like we saw in the case of EPC contract, even in the case of supply contract the supplier is excused for any force majeure events, so if there is any disruption in supplies, because of a force majeure event, which are defined as per the supply contract. Then the supplier is excused from paying any penalties or damages, if the supplier will have to create any additional infrastructure. For example, a pipeline needs to be constructed for transferring fuel from this refinery to let us say the project site, then the project company will have to make capacity payments for constructing this physical infrastructure.

So, this is not as a part of a supply contract, supply contract involves just the supply of fuel, but the support infrastructure that needed to be constructed will have to be paid by the project company. How do you actually decide on the price, so remember a supply

contract does not only talk about availability of supplies at required quantity, and the required quality it also specifies the price at which it will be purchased.

Since the supply cost accounts for substantial percentage of operation cost, in most of the cases the supply price is based on the off take contract. So, if there is a provision for increase in off take contract, because of changes in consumer price index and so on, then the cost of the input supply will also increase parallely. Sometimes the off take price of the is decided based on the input supplies, so in those circumstances the supply price is taken as the basis.

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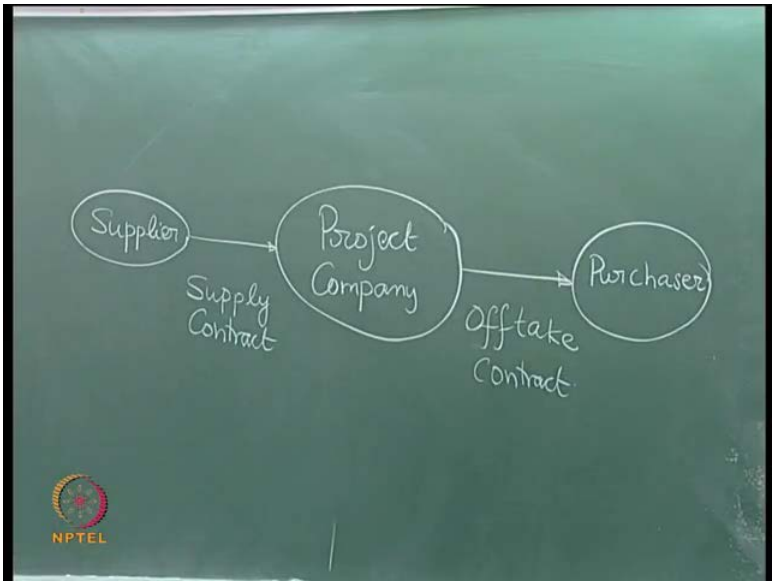

And based on that the off take price is decided, but any which way there is a close relationship between the supply price and the off take price termination. So, like all contracts, whenever the contract terms are not honored it can be terminated.

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And the termination remember a contract has two parties, in this case there is a supplier and there is a project company, so therefore any contract can be terminated by any of the parties, so the contract can be terminated by the supplier, if any of the following occurs. For example, the project company does not pay for the supplies there is a delay or the project company is unable to actually make payments it is having some problem.

So, whatever it is under the circumstances the supply contract can be cancelled or the project has been abandoned, for whatever reason the market is not there. The market the price has become very unviable for the project to operate for whatever reason, if the project is abandoned, then the supplier can terminate or if the project is in insolvency that is it is unable to pay its creditors, it is unable to pay its suppliers.

So, under such circumstances the supplier can terminate the project contract, so insolvency can actually looked at it from a variety of perspective, in many time people may not actually look at insolvency to occur. There could be some indications that insolvency could occur in the future, see for example, if there is a drop in the credit rating of the project company, then the supplier can terminate the project contract, because it puts payment receipt at risk.

If the company is insolvent, how will they be able to pay for the supplies that they have received, so to avoid writing off supplies made to the project company, the supplier can actually terminate the supply contract. There can be termination from the project

company as well, when can they actually terminate the contract, when the supplier fails to make deliveries, as per agreed term. Subject to exemptions of course, whenever there is a force majeure clause then you know the input supplier is exempted, when there is insolvency of the input supplier.

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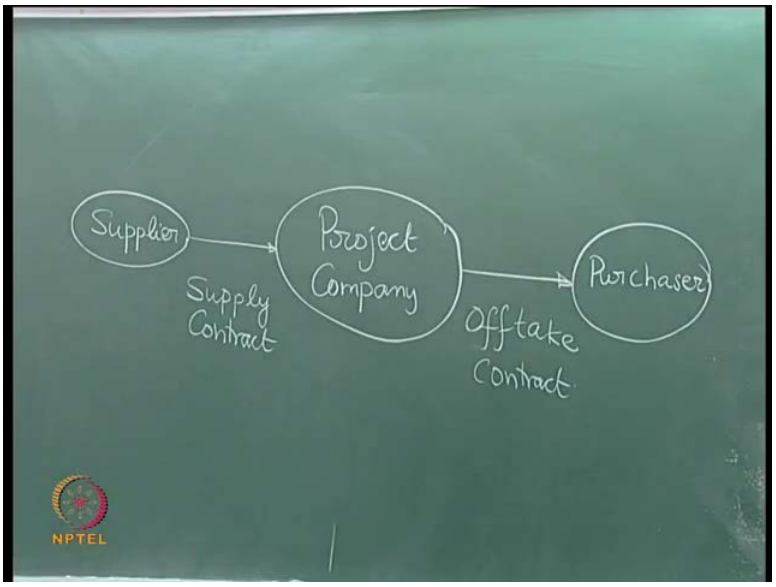

So, that means, if the input supplier is having some problems with the creditors, and is unable to make their payment on time; that means, the supplier is exposed to the threat of bankruptcy. And under the circumstances he will not be in a position to honor the supply contract, so therefore the project company should not be dependent on the supplier, because the supplier is in bad times.

So, under the circumstances it is prudent, for the project company to look for an alternative supplier and terminate the existing contract, because the project company has additional contracts, and if there is a problem in supply contract he will have to still make for possible damages, if the other contract terms are not honored. So, therefore, he will have to look at new supplier, so that he is in a position to honor the terms of the off take contract, the termination can also happen by the project company, if there is a default by a guarantor of the input supply contract.

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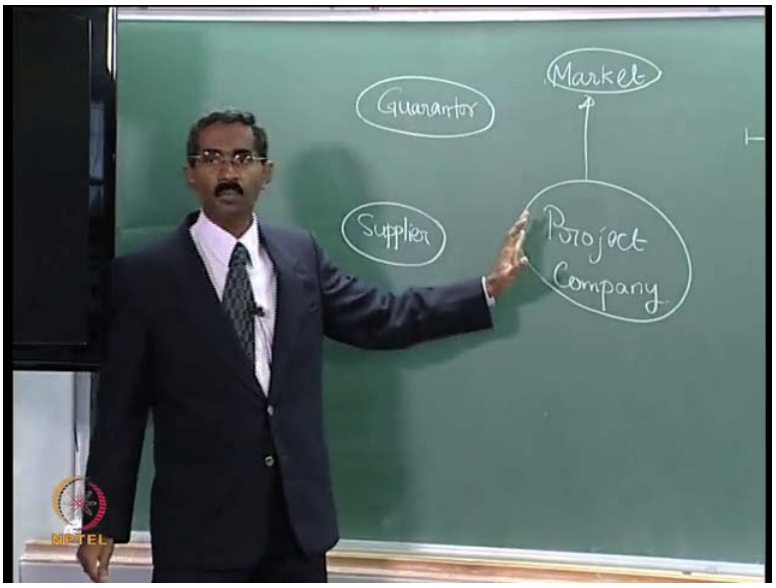

So, a guarantor when do we actually use a guarantor, so let us say for example, so there is a project company, and then there is a supplier, if the supplier is not able to supply as per the agreed upon terms. So, the project has to function, so the project will actually have to acquire the supplies from, let us say another supplier on the open market. So, by doing, so the project company incurs additional cost, as compared to what it would have incurred, when it got the supplies from the supplier.

So, the supplier will have to compensate for the additional cost, that the project company incurs, whenever it is making these kinds of purchases from the open market. So, to ensure that the supplier will be able to pay these additional cost, the project company will ask for a guarantor, so it could be a bank, it could a guarantee provided by the supply the corporate itself, whatever it may be.

There should be a guarantor, which should ensure that any additional cost incurred in market purchases are compensated, so if there is a default by the guarantor. If the guarantor is not in a position to make good of the additional cost incurred by the project company, then the project company can go ahead and cancel the supply contract, so this is a another basis which termination can happen.

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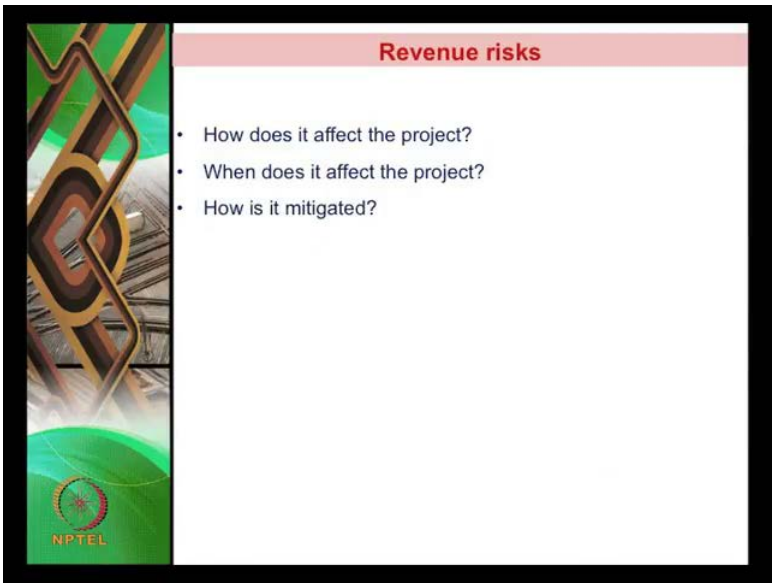

Now, let us look at the next category of risk, this is called as your revenue risk, we start with the same three questions, how does it affect the project, if there are no revenues. It questions the viability of the project no revenues, no cash flows, no profits, you cannot service the debt. So obviously, lenders are going to be concerned, and it can lead to lenders taking over the project or project bankruptcy, so it is going to have a tremendous impact on the project.

When does it affect the project, so in the construction and the operation phase, the project gets revenues only in the operation phase, so therefore it affects most during the operation phase. How is it mitigated, what kind of strategies that we use to mitigate the revenue risk. Revenue risks are mitigated by signing a project agreement, so this project agreement provides a framework under which the project company obtains it is revenues. The agreement will clearly mention the basis on which the revenues are going to come for the project, so broadly project agreements can be classified into two types, One is your off take contract, and your concession agreement.

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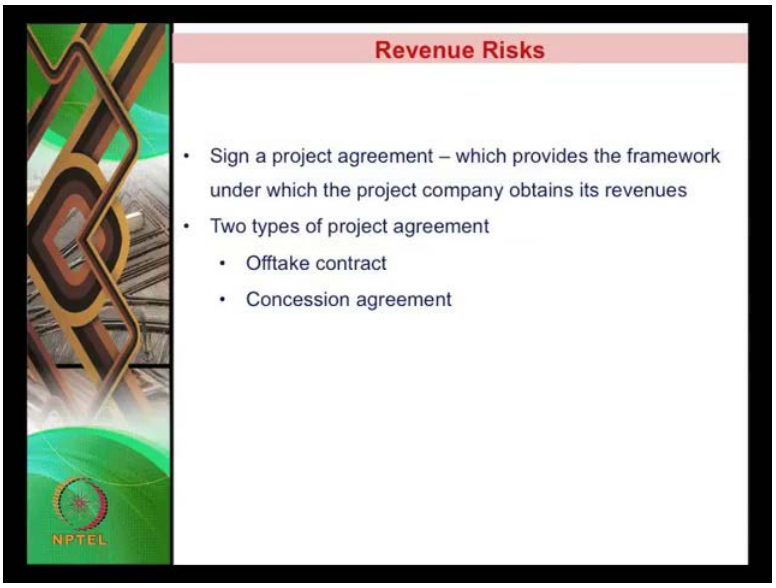

So, an off take contract is one where there is an agreement with the purchaser, so let say for example, between a project company and the purchaser, there is a contract and this is called as an off take contract. The purchaser gives an agreement that he will purchase certain amount of electricity, certain amount of steel, and whatever it may be and that is your off take contract. And second is your concession agreement, concession agreement is a license issued by a public authority, for a company to offer its products or services to the public or to the public authority, so it is a more of a license to operate or offer the services.

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Let us look at the off take contract first, what is a major objective of the off take contract, the objective of the off take contract is to limit the risk of a company selling it is product. If the product has been produced and if the project is not able to sell the project, then it is lot of risk, to eliminate the revenue risk the project company signs an off take contract, there is somebody who is going to buy there is a confirmed buyer, for the off take contract.

There are different types of off take contracts, there is a take or pay contract, which kind of indicates that even if the purchaser pays for it, even if he is not having any need for the product. Either you purchaser takes the product and pays or even if he does not take he still pays for the product. Then there is a take and pay contract, which is to actually pay for the purchase depending on the amount, that is actually being purchased.

Then we have a long term sales contract, in a long term sales contract there is a purchaser who assures that he will purchase a specific quantity, but he does not give a guarantee in terms of what price will the purchase happen. So, in a long term sales contract the demand risk is mitigated, because there is somebody who is going to buy, but what is not mitigated is price risk, because we do not know what price the sale will happen.

Then we have what is called as a hedging contract, so in a hedging contract the buyer, the price in hedging contract is depends it actually is agreed upon some commonly available index values. If the index value falls below certain level, then in a hedging contract there is a float float price that is fixed, so that is that indicates that the purchase price will not fall below the float price.

Under the same time if the index values exceed a certain level, there is a ceiling that is also fixed, whereby the purchaser will fix will not pay the actual index price, but will actually pays the ceiling price fixed under the hedging contract. So, between the floor and the ceiling, the purchase will be decided upon what are the index value, then there is a contract for differences is very similar to a hedging contract. But, in this case the purchase is not made by a buyer, but the project company sells a project sells the output to the market.

And then the purchaser purchases from the market, and then similar to a hedging there is a floor, there is a ceiling and you actually compensate for the differences. And then there

is a through put contract, so through put contract is basically a volume contract which indicates that so much of volume is going to be pumped in so much of volume is going to be used of the capacity and so on, so this is your through put contract.

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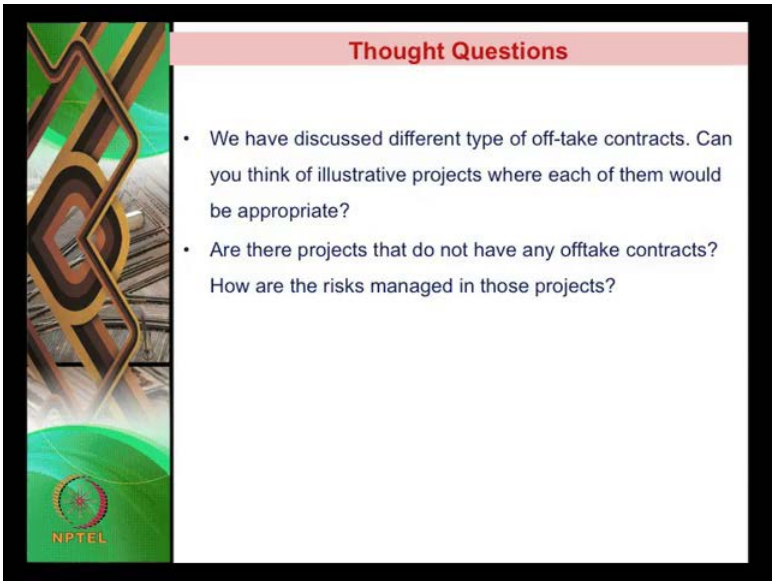

So, the applicability of the contract varies from situation to situation, so the question that I have for this lecture is we have discussed the different types of off take contracts. So, can you think of illustrative projects where each of them would be appropriate, so where will you actually use a through put contract, where will you actually use a long term sales contract and so on.

The second question is are there projects that do not have any off take contracts, so they do not have any contract with the purchaser or the market or you know for any other body. How are this risks managed in those projects, so think about these two questions and we will discuss in the next lecture.