Introduction to Lean Construction
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Module 1 - Lecture 54
Collaborative "Pull" Planning, Percentage Plan Completed (PPC), Daily Huddle, Variance Analysis RAC

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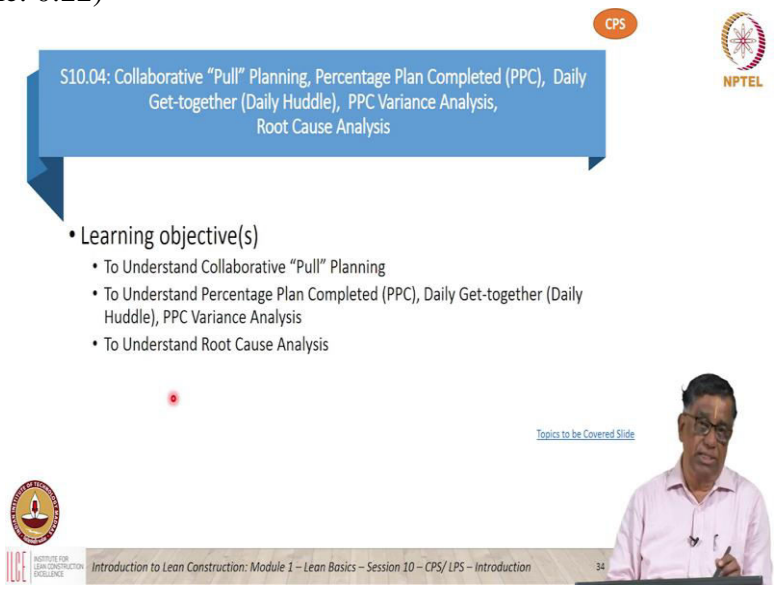

So, now we come to the next module, sorry the next session, the learning objectives here are to understand the pull planning better. And then understand these terms PPC and then weekly huddle, daily huddle and do variance analysis, understand root cause analysis and so on.

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If you look at see you know a good picture of how the poor planning is done for the weekly planning or the Look Ahead planning, all the concerned people are there, this is a very, very

interesting chart here. Typically, what we do? we have this number of sticky notes. So, the we start from the rear end and come down to the front later by and by. First the last activity man, he goes and puts his sticky note of you know, how much work he can do, provided you know, the various things are given to him. So, the previous man comes and puts his sticky note in a different color, saying what he will do on various previous dates.

For example, concrete to be done on Saturday, formwork may have to be ready on Wednesday, rebar may have to be ready on Thursday, and Friday, and so on. So, all these promises are all coming on the same chart in different colors. And in by putting by the different people were concerned. That is a great advantage of this pool planning session being done in a big room by all the concerned people at the same time.

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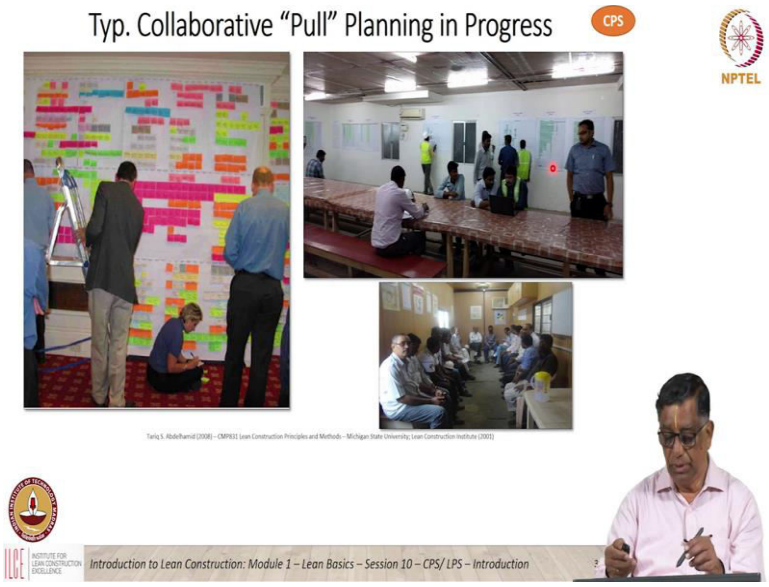

So, there are very, very interesting, you know, to look at how the various people come together in the same room, talk to each other, understand the work better, make promises, take promises, and then work toward the complete planning. In large project, for example, where you know, people cannot come together in the same space, we can do also do is you know, with the mobiles to some extent, but nothing beats, you know, coming together in person.

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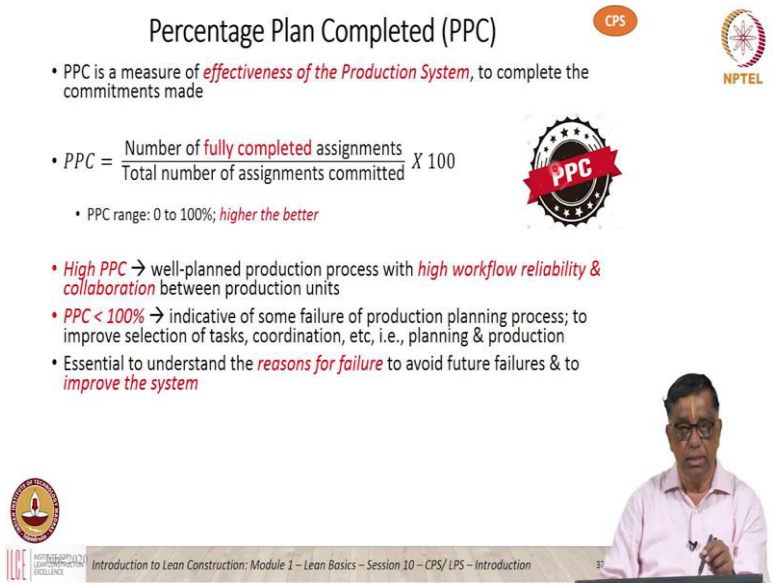

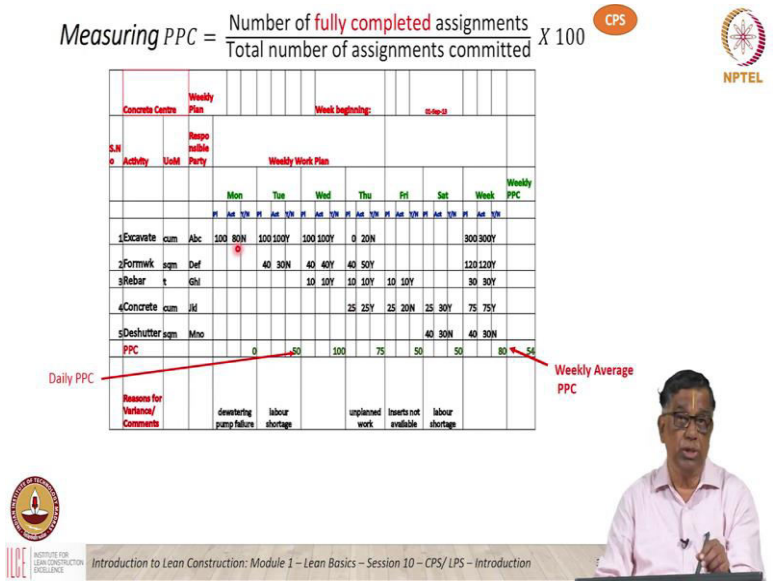

I talked to you about this parameter called PPC, the Plan Percent Complete is a measure of the effectiveness of the production system, which we have formulated now, in mathematical terms, it is a number of fully completed assignments divided by total number of assignments committed, multiplied by 100.

For example, if you look at a weekly planning, so we have Monday to Saturday, and there are various activities. And these are the various, you know, the first column in every day that says how much I have planned to do on that given day. The second column says how much actually have done, for example, against 100 have done 80 and the definition of PPC, if you remember, number of fully completed assignments, the catch here is fully completed.

So, if I have doing a, for example, a plastering on a floor, on a wall, the next activity to that is probably tiling on the floor. So, unless I do the plastering completely on the wall, and then you know, when you are doing plastering, lot of material going to follow the ground are you to do cleaning up also. So, when I say my work is complete, it gets completed, only when I do the plastering, I do the cleaning up of the damage which I have cost, then only the next one can come for the floor tiling.

So, on a given day, I do say 95 percent of the work. The remaining areas not plastered on the floor is not clean. What happens you know, if I do not inform the people other people next morning, the telling crew comes in and they find that they cannot start the work the entire tiling crews idle just because have not completed 5 percent of work.

Whereas if they say the previous day, I have not completed the work because I have not done 100 percent. Then the tiling crew gets a pre-planning, they can go to another place for doing the work. So, the definition of PPC is always number of activities which are fully completed, fully means totally, you do not have to go back to the place again that is the kind of thing.

So, 80 out of 100. I do not get 80 percent as PPC, I get 0. And if you do more than 100. What is the problem? The problem is not useful to the subsequent activity. The subsequent activity man is only waiting for the 100 percent work to be completed. If you do more area. I am not planned for that additional area. So, it is no used to be is actually work in progress. So, we want to avoid waste. So, whatever you promise do that much and be done with it.

So, you do not get more marks, higher PPC beyond 100 either up to 100, or we have something less like that. So, we, every day we see whether we have met the targets or not. Y means Y yes, N means no, we count the number of Yes's, Yes at the end of the week, divided by total number of activities, and workout the percentage.

So, here, for example, we got 80 percent, as the weekly average PPC, we can also measure the PPC every day. These numbers are, for example, daily PPC, these are not of real use, but they are giving an idea of the variation during the week. Am I being consistent across the week? Or am I performing on a given day and not performing on the other days, so that I need to analyze and improve myself.

So, PPC is that a very good PPC means the work is well planned, well-coordinated, and you are generally keeping your promises, keeping up to your promises. At PPC less than 100

means there are a number of things wrong, we need to find out why and keep improving ourselves.

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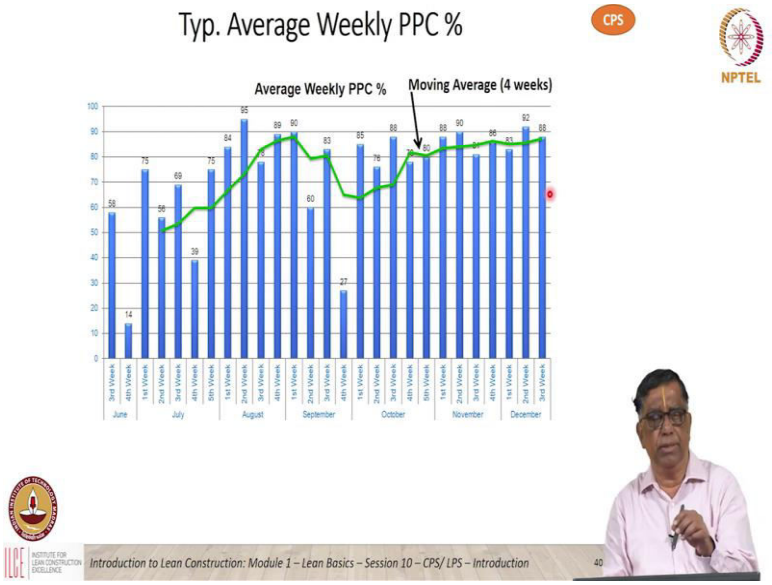

So, the reasons for failure, that is what we need to identify by the, the root cause analysis. And then what, how do we measure PPC every day? The planning manager goes around to the various sites, or at the end of the day, all people come together in a single place called the daily huddle. You know, in IPL, you would have seen all the players, you know, getting together like that discussing strategy, or just you know, boosting up the morale of the team like that. That is called a huddle.

So, the end of the day daily, all the people come together, they you know, exchange notes, I could you know, the planning manager takes talk, have you done 100 percent? Or not? What have you done? How much have you done, what have been your problems, the planning manager also has what are your problems, and then goes into the root cause, and that are being analyzed separately.

So, this activity can be done, you know, at a given time, say, for example, the shift is ending at 7pm. So, 7:10 7:15, everybody gets together to the same place, or large projects, you know, you have a mobile connectivity connection between all the people, and everybody reports, and they note down.

So, at the time the subsequent activity man also understands whether his front is going to be available on the next day for him or not, the tiling man, for example, he will know whether the plastering has been completed or not. And then he adjust his work accordingly. So, he could even have a cup of tea or the type of doing the daily huddle, so that goes on.

And then every week we plan, we plot this PPC like this, you know, bars or plan every day. And these are having too much variation. So, what do we call what is called the moving average, say, a moving average over 4 weeks, or 5 weeks like that, that gives you a smoother line to get the general trend.

Here, if we look at the trend year, generally, I am going from about 50 percent up to about 85 percent I am progressing over time. Happy, people are learning they are doing work, and they are improving all the time. I am quite happy with this. You somebody consistently gets 100 percent PPC, what does that mean? It could be that either the great performer, or he is under promising. If I can do 100 cubic meters every day, I keep on saying 80 cubic meter, I keep achieving that.

Ultimately, you will get caught because people know that you have a greater potential, but you are not committing to your greater potential. So, consistently 100 percent PPC is not good, consistently low PPC also not good. That means you are not able to plan, you are not able to perform something around 80 to 90 percent, PPC consistently, we are quite happy with that, that is what we need to keep checking.

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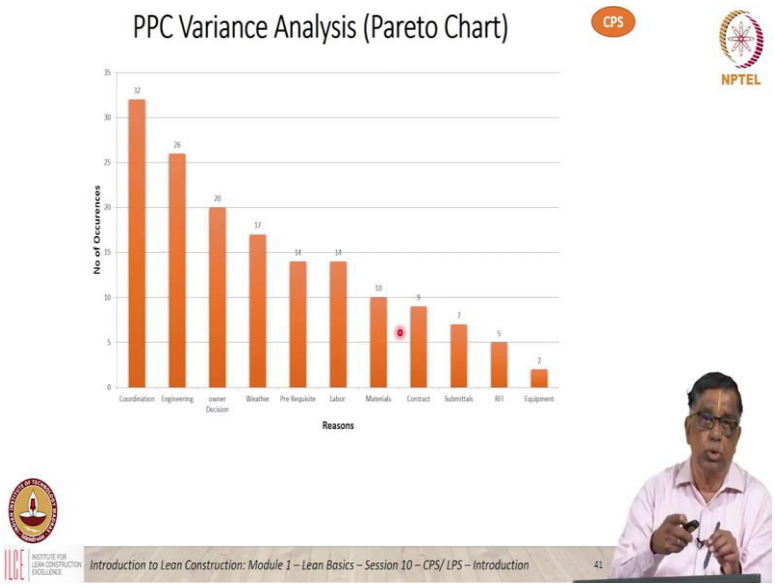

And then when something is not being done properly, we identify the reasons, for example, you can arrange them in the order of increasing magnitude or decrease the magnitude here for example, we say coordination problem, design problem, then you know the owner decision weather the pre-requisites are not done.

So, how many times some reason is occurring again and again, you something happening regularly, too many times, then we need to tackle that particular reason, if coordination is the main problem occurring, so many times you know, in a given period, I need to see why my coordination is not good. If owner decision is again a big problem consistently, I need to look at that. So, this Pareto chart, you know, gives me the order of importance of the various problems and what I need to tackle to remove or to remedy it to ensure that I get consistently a higher PPC.

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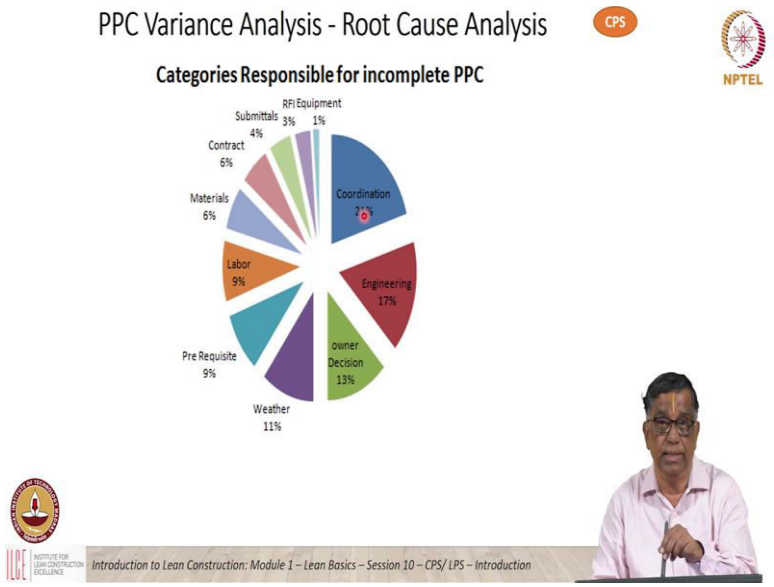

Another beautiful tool of root of lean is something called Root Cause Analysis. We find, we at the end of the day, everyday the planning manager asked the concerned frontline people, why have not you been able to complete 100 percent PPC, they give the reasons. So, depending on the number of times, the reason occurs again and again, we draw a pie chart, same thing what you saw the Pareto chart is also coming here, coordination problem, engineering, owner decision and so on. So, we immediately understand what is the main culprit? And then we need to tackle that again and again to find out the reason.

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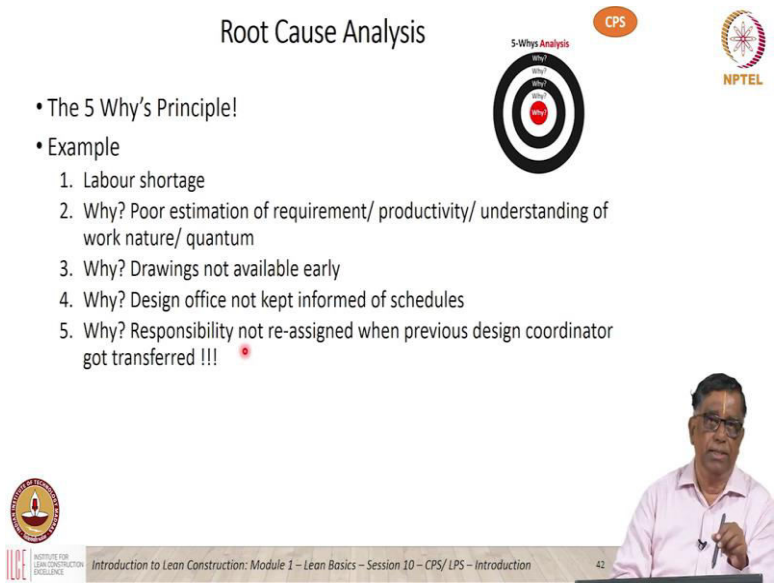

The 5, you know, when you want to look at the root cause, you need to ask why? Why? Why? 5 times, for example, some site they said I could not complete the work because of

labor shortage. Well, you asked why have you, have a labour shortage. He says, I did not understand estimate properly, how much was the work involved, why you should do that, the drawing was given to me very late, I did not get the drawing early, why not? The drawing office was not informed, that the drawing would be required by a particular week, and why was had not done because the person, the design coordinator are got transferred another man has not been appointed. So, there is a communication gap there.

So, the apparent reason is labor shortage, the real reason is something else. So, for every problem we encounter, we need to ask why 5 times, go deep down into the real cause, and sought the real cause, sort out the real cause, so that we are able to get consistently better performance all the time, that is the meaning behind a root cause analysis.

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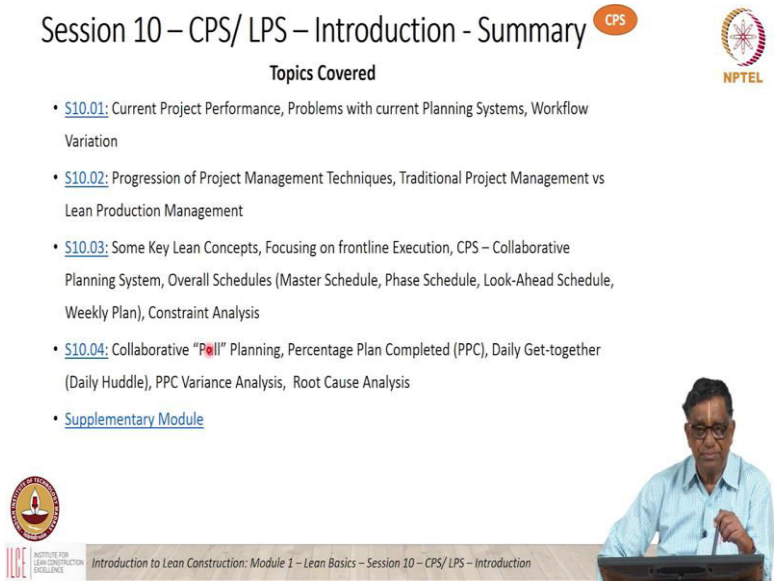

So, we have covered session 10 on collaborative planning system, the introduction part. So, just to summarize, what you know, we had seen in the first part, we looked at you know, why CPS, the current project performance, what are the problems with the current planning systems, about workflow variation and so on, and how CPS can help.

The second one, we looked at the progression of various project management techniques. And then, you know, we looked at the differences between traditional project management and the Lean Production Management. Then we looked at some of the key lean concepts, and then, you know, saw how to focus on the frontline execution with CPS.

So, we had several schedules to cascading down from the overall milestone schedule, the phase schedules, the look ahead schedule, weekly plan, and then coming to the daily plan, of course, concurrently with the constraint analysis, and root cause analysis.

So, the next session, we looked at what exactly is pull planning, how to do collaborative pull planning in a big room, and we looked at a very key metric, the PPC, the Plan Percent Completed, and then we talked about the daily huddles, and then, you know, analyzing your PPC variances, and then the root cause analysis, a very, very important part and the feedback loops at various stages.

Then, of course, you also have the supplementary module from where you can learn more about the CPS process. So, I think definitely, it is high time you started practicing CPS in your sites, and reap a lot of benefits. All the best. Thank you.

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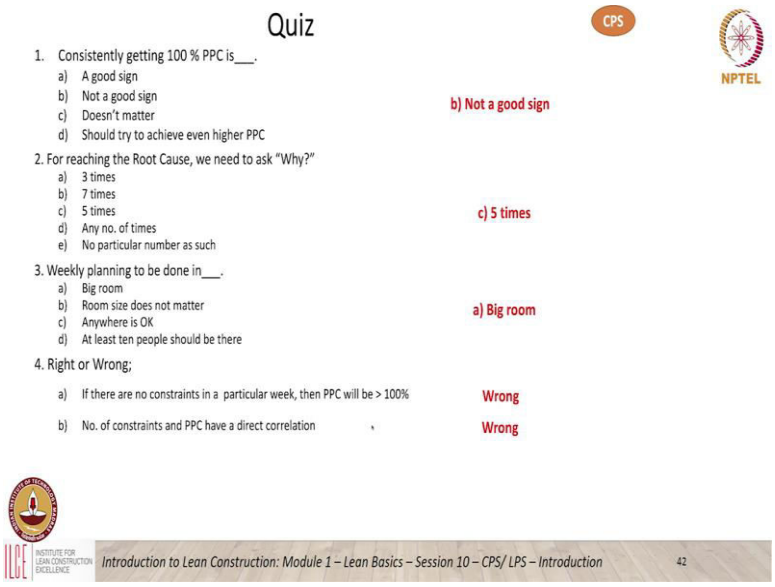

Supplementary Module

Link (to read and contribute)

https://tinyurl.com/yf9pvee6