Project Planning & Control

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Lecture - 46

Project Monitoring and Control Typical Project Time

Monitoring Process, Levels and Frequency of Updates

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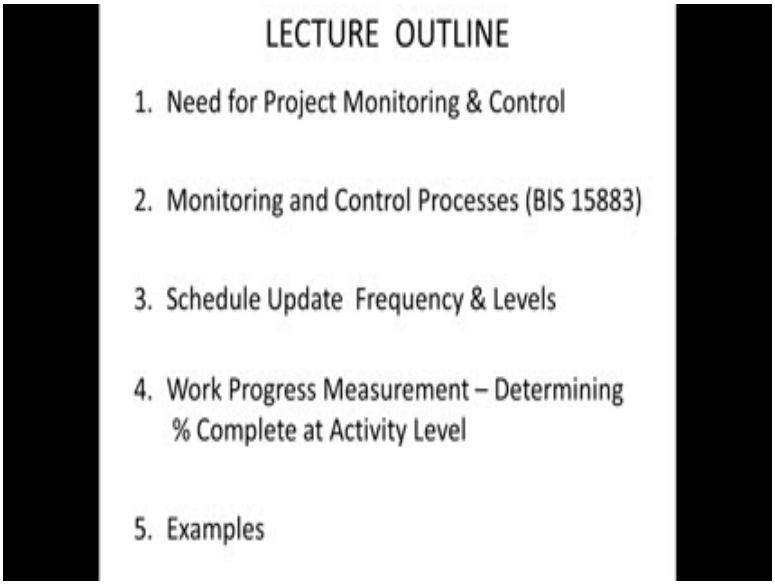

Welcome to this lecture. The topic we are going to cover today is on project monitoring and a little bit on control. We will actually have two lectures on this topic; the lecture today will be more general one on monitoring and its requirements. And the next lecture will be on an earned value system which we will be using for getting more details on monitoring. So, for this lecture, the outline is as follows; we will discuss the need for monitoring and control. And then we will look at some standardised processes which are defined in the BIS standard for monitoring and control. We will look at the flow chart, the activities, we will get a little broader perspective on it. And then we will get into specifics like, when we do monitoring, what is the frequency we need to monitor, what are the levels; this will coincide with the levels of planning will do a little bit discussion on that. And then we get into a lot of detail on how do we actually measure work progress and an important issue here is measuring what we called percentage complete.

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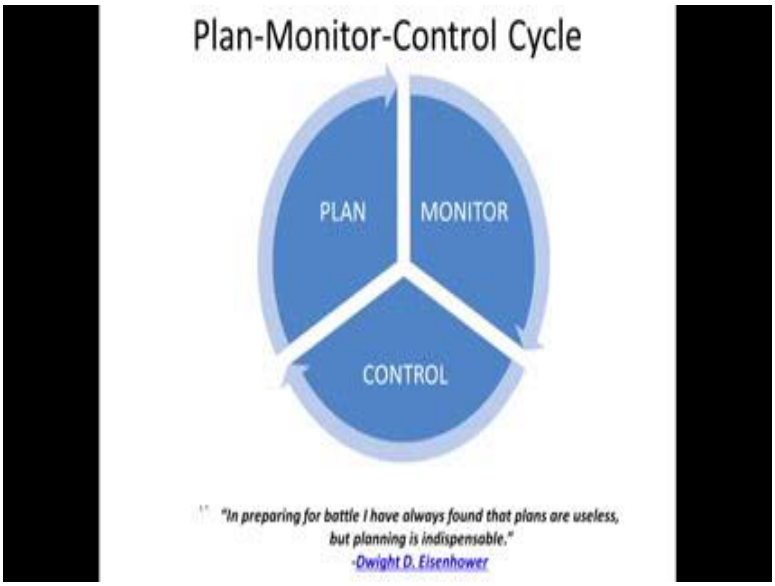

So, how do we measure percentage complete of an activity? So these are the topics which we going to cover. And finally, we will talk about, we will give a couple of examples show how we are going to do this percentage complete measurement and some of the problems associated with this percentage complete measurement. So, you might remember this from the first lecture, where we said a lot of what we do is in the cycle of plan, monitor and control. And until now we have been mostly focusing on the planning side. So, we been focusing on how we plan and all the lectures so far has been focused on planning and various aspects of planning. And it is only in the next few lectures, we will we talk about monitoring. I will touch upon control - a little bit on control in this lecture, but we will see that we cannot do too much of theory as far as control is concerned and it is more an applied area, and we will discuss why.

Now, when we talk about this plan, monitoring and control or even planning specifically there is this quotation which I think is very interesting, it is by Eisenhower. And he says "in preparing for battle I have always found that plans are useless, but planning is indispensable". Now give it some thought- what does this mean? he says plans are useless, but planning is indispensable. So, what people interpreted of Eisenhower was that involved was one of the generals in the war. And when he says plans are useless, what he says is what you actually plan to do never happens, you will have to make changes, you will have to adapt, you will have to be able to monitor, what is happening and make changes as you go long. But the process of planning, getting the team together, discussing things, getting everybody's ideas, that is the process of planning, planning as

such is indispensable. So, when we get into the plan, monitor and control cycle it will be easy to see that or we will kind of illustrate that the plan which we make is not going to work the way we originally envisioned it. So, we have to keep monitoring the plan and applying control, so that a project tries to stay to the original objectives. We might not follow exactly the same path as we planned originally, but we need to monitor and control to get this going.

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Let me kind of illustrate this with an example. This is a very simple example; let me say the objective is to travel from the IIT Madras to Chennai Central, and you have forty minutes to do it. You have a train to catch, and you want to travel from IIT Madras to Chennai Central station. Now obviously, you have to develop a plan, what would you do to plan? Think about it. Today with the technology what you would probably do is develop a route like this on your Google map, and you can see IIT is here, and Google has chosen.. has given me three options. You can see some other options are in grey, but there is one option which is highlighted which takes 31 minutes is what I am choosing. There is actually a second option at 31 minutes too, and a third option which takes less time 29 minutes. But for many reasons, based on being a Chennai resident, I am deciding to take the 31 minutes along the Marina beach, because I probably like to drive along the beach or there are other reasons for which, but it gets me to Chennai Central within my stipulated time frame. So, I am going choose this as my option.

Now plan from here says 31 minutes; I have a planned duration of 31 minutes. And I am deciding my mode of transport will be an auto, taxi or car; so that my speed is as Google

has planned it, and not a public transport system which might be a different plan with a different time slot. Now, so this is my plan; and now I am starting my travel. So, I start my travel here, will everything go according to plan and I reach exactly in 31 minutes? It is very unlikely. So, as I am going on my route, I have to monitor my progress right? You will have to monitor to see how you are doing, so we have different milestones on the way. So, I can have a variety of milestones which I actually pass; and at each of the milestones, I can see am I keeping to my plan or am I not keeping my plan.

So, for example, in this route, I see there is a heavy traffic area here; it is marked in red. So, I have to check, so obviously, today what with my GPS system, it will tell me how much time is remaining and things like that. So, it is monitoring my activity and telling me, if I am keeping to plan or not or I can use the details from what Google tells me or Google map tells me tp see if I am going to keep plan or not. Now I will certainly check this constantly till I have reached the station. So, when I will be monitoring, so if you want to answer the question, why, how and when, I will certainly be monitoring to make sure that I do not fall behind it and I will make it to the station within the stipulated time.

In this particular case, I will certainly use my Google map to keep monitoring my progress, and how frequently will I monitor, this is another very important is the important question. Am I going to constantly look at the map and see every second, am I keeping time or not, probably not. I am going to probably look at it once probably once every 10 minutes or might be seven to eight minutes to see if things are going. And if things are going extremely well I might not even look at it at all; I might have a feel that things are ok. So, you will need to monitor whereas, where is it likely that I will not monitor the progress at all, is it likely that once I start from IIT, I will not look at the map till I reach Chennai central? Might not be. Especially if there are few bottlenecks in the way ,I will then certainly look into see when I am going to reach.

What are potential disruption to the plan; certainly if I have an open road, everything is predictable, there will be no disruptions, but as we know that is not the case, there can be several disruptions;including, it could be a minor accident on the way will back up traffic; there might a road closer due to some event which can again change things. So, there can be a lot of disruptions to the plan. And if there is a disruption, let us say I reach you can see Santhome is here, I reach Santhome and I reach Santhome, and I already spent 25 minutes, I have only 15 more minutes to get to Chennai Central. Now how would I establish some kind of control on this, might be I can choose a different path or I

might have to go faster or there might be in this particular opinion I do not see any other strategy, either I have to choose different path or go faster. So, these are the control strategies for this particular situation.

So, this gives you an example of what we mean by plan, monitor and control in an everyday context. Now, we use this situation with a very, very sophisticated tool like a Google map available to us with GPS tracking which is what most of us do today. Now, imagine if there was no Google map or no GPS to allow you to track continuously, what would you do? Just think about it and might be if there are any questions on it, we can post it on the discussion forum, but think what you would if the technology was not available and that is in some ways where we are in construction; technology starting to be available, but once we plan, the way we monitor and the way we kind of get monitoring information, the technology is only starting to develop.

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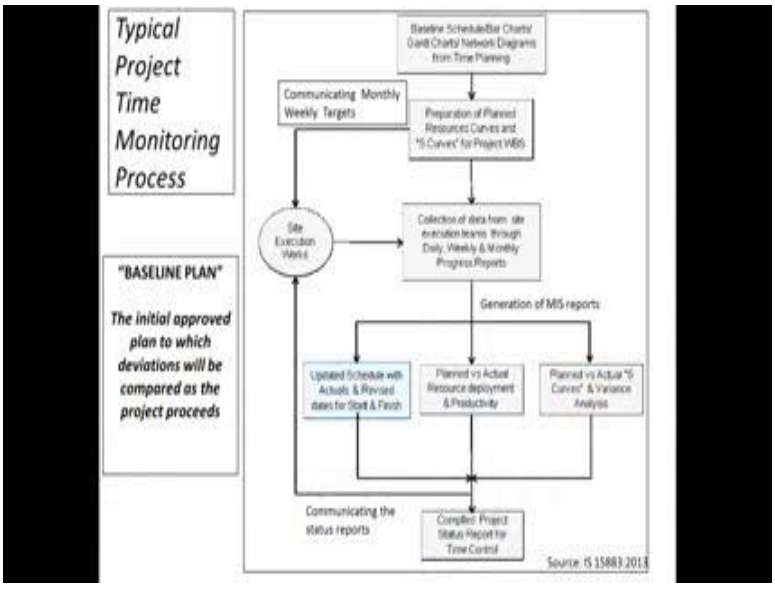

So, if we get into this whole area of monitoring, and we look at what is the formal way in which monitoring is to be done, there is this flow chart that is available as a part of the IS 15883. And you can see that we have several parts of a flow chart, let me go through it in some amount of detail. So, we first have to assume that the plan is done. So, you can see the time planning is done, the baseline scheduled bar charts, all this which we have covered earlier is done. So, this is the plan is done. We talked about this also the preparation of planning, resources, S-curve, project WBS, all this is also done. And based on this, the site execution starts; execution of the site works is going on. And based on the site works we get collect data from the site, we get daily, weekly, monthly progress

reports are coming from the site.

Using these reports, we generate MIS reports, using this data, we generate MIS reports, we update the schedule, we have actual was revised for start and finish, we update the schedule. We have planned versus actual for resource deployment and productivity. We have planned versus actual for S-curve and variance analysis. So, all this information is monitoring information that is coming from the data that is collected once a project starts. And based on this information, we compile a project status report and communicate the status report to the site to see if they should take any control action or what they should do. Now, this gives you a nice overview of how the planning kind of moves to a monitoring phase. The planning phase moves to a monitoring phase.

Now the key output from the planning phase is the baseline plan. So, what we.. the term baseline plan is very important. So, baseline plan as we have defined here as initial approved plan to which deviation will be compared as project proceeds. Without a baseline plan, there is no meaning, because we do not have a benchmark to compare anything with. So, the baseline forms the basis and once and then it is only a based on this baseline that monitoring is going to be done. And of course if we have major changes in the project requirements as we progress, we can have baselines themselves changing, but we need to agree to a change of baseline as we progress. Typically when we say monitoring, it is against a specific baseline.

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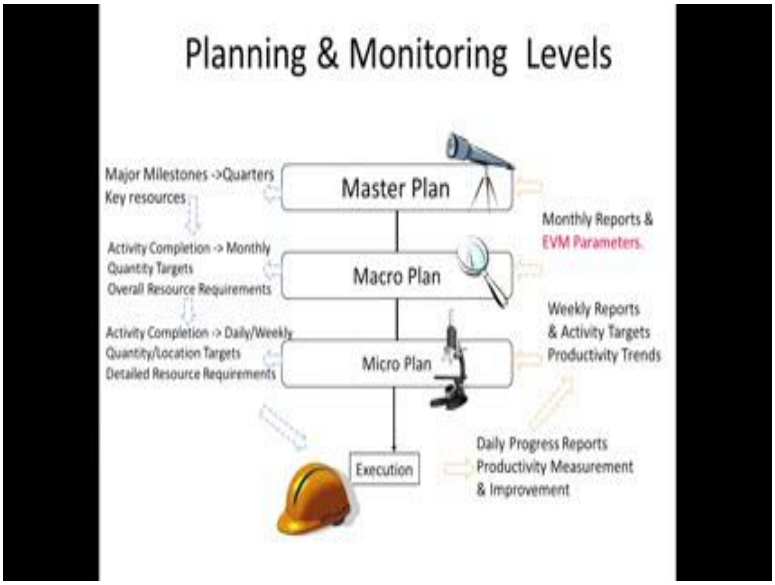

Now, we can look at this in a different perspective; I think you might be familiar with

this; we use this also in some of the earlier lectures where we are talking about planning and monitoring levels. We talked about having the master plan, the macro and micro plan, and I just abstracted it to these three broad levels. And as we had seen in some lectures earlier, that there are several levels of planning that can be done. So, if we look at this broad issue, we can see at the master plan level, we can look at the planning outputs that are coming; you have major milestones, key resources and then at the macro plan level we have activity completion, quantity targets; all this is coming at the macro plan level. And then, when we go to the micro plan, we have activity completion at the daily and weekly level. Quantity, location, targets detailed resource requirements are the micro plan. So, we really have looked at mostly, as I discussed before in this class, we are dealing with the macro plan. The network level planning is dealing with the macro plan.

Now, after we get into execution, we are now going to look at data coming out of execution. As we saw in the earlier set of slides, we got into execution and then data starts coming out of execution. So, similarly here we get into execution and data start coming out of execution; we have daily progress reports that come out of the execution; and based on daily progress report, there is again productivity measurement and improvement in a lot of very detailed things e that can be done at the execution level. So this gives you data from micro planning which then if any changes are required at the daily or weekly level, the micro plan is done in execution is adapted to the micro plan. And based on this, we also get the micro planning data. So, this provides feedback back to a network to update a network into doing a network analysis.

So, this is primarily our focus, how do we update the network, what kind of information do we do in terms of network analysis, especially at the level of the macro plan. And we will also cover what we are doing here, just earned value measurements, the type of reports, all of these also become important because when we go to the top higher management this is how they would monitor the project. So, the level at which we are doing is very important. So, please recall that the network kind of analysis we do is at the macro planning level. When you go to a micro plan, it might be a spreadsheet, because only you need to do it daily, weekly very detail planning. And the master plan can be a broad level milestone plan.

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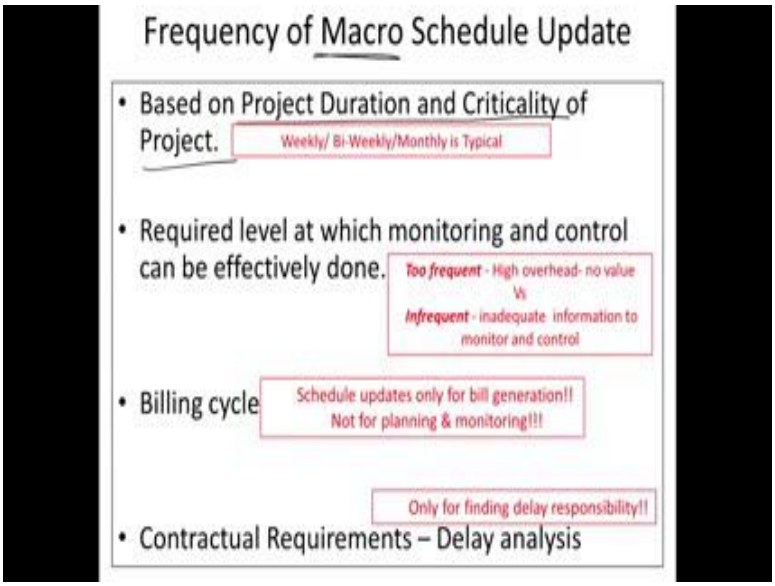

So, come back to look at this, another key issue here is at what frequency do I update, how frequently do with us execution kind of update the micro plan. How do you read, how frequently should my micro plan to be updated, these things become extremely important and even in the process here, which talked about daily, weekly monthly progress reports. So, when we come to the frequency of update and here please look at this, we are not talking about the frequency of update of any schedule, we are talking about a frequency update of the macro schedule.

So, if we look at just the macro schedule, if we look at only the macro schedule here, am I going to update on a daily level? That is going to be quite a challenge because I cannot keep going back to my network and updating at a daily level. So, a lot of times we will see that macro schedules are updated based on the need for the project duration and the criticality of the project. So, you can have project duration of several years in which case even a weekly update might not be necessary; it might be a biweekly or monthly update; depends on the criticality of the project, if there something and you have to the overhead you used to update you need a lot of resources also to update the project.

So, if I am going to do a weekly update that means, the resources I deploy should be justified in the cost of that should be justified based on the criticality of the project. There are certain projects for example, which I would use a weekly update because a project duration is only a few months. And if I miss a couple of week that means, I lose a lot of information. So, in some cases, we might need weekly; some cases, it can be biweekly; in some cases, monthly. And this will like we have noted here depends on the

duration and criticality. Now the required level at which monitoring control can be done is like we discussed, if it is too frequent, there is high overhead and no value; if it is infrequent, then inadequate information to monitor and control.

I discussed this point earlier, but basically we are saying I mean it seems that now the more frequently I monitor, the better things are going to be. But you can use the trip example, am I going to look at the GPS every few seconds, no, it is not, it is going to be too much of overburden for me, but I should have the right time when I am looking at it, so that I can monitor my progress and take control actions. So, this would be critical in the way we are doing the monitoring cycle.

We find in a lot of cases monitoring is done not based on planning requirements or monitoring requirements, but based on the billing cycling. A lot of companies will require the plan and the update of the plan to be submitted for payments. So, you will find that schedules are updated only for bill generation and not for planning and monitoring. So, this is really an issue, it is a practical issue, we will find that planning teams or the company certainly decide certainly needs the cash flow to keep going, but the intent of doing the schedule update if it is only to generate cash flow it can compromise planning.

And the last point to a lot of times, the schedule update is only done based for contractual requirements; contract says a certain time and they do it only based on the contractual requirements, but might not be what the plan requires. The plan might be more frequent, but because of a contractual need it is done as specified by the contract. Or even more importantly in sometimes, the schedule is only maintained for delay analysis. So, if something goes wrong with the project, then delay analysis is kind of a postmortem of the project, and if you are maintaining a schedule only to kind of do an analysis of what went wrong, later then you are actually not using it for planning and this is also not a very good primary reason to keep updating the schedule. So, delay analysis also has a specific frequency with which you keep updates, so that later on when you do an analysis of delays, you can find reasons at the correct level of detail. So, again to summarize the slide, we should really do updates based on my planning and monitoring requirement and that can be weekly, biweekly or monthly depending on the duration and criticality of the project.