Project Planning & Control

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Lecture - 37

Resource Leveling-Example Network

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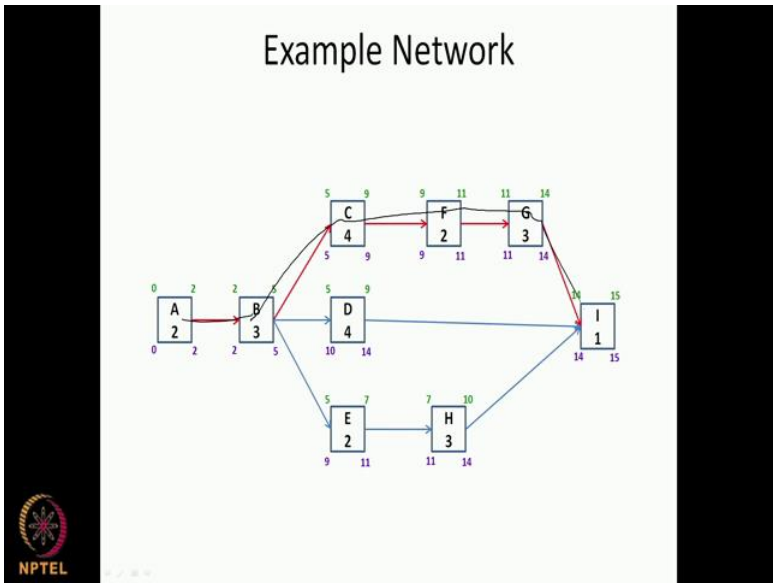

Now, we have this network we had considered in the last example.

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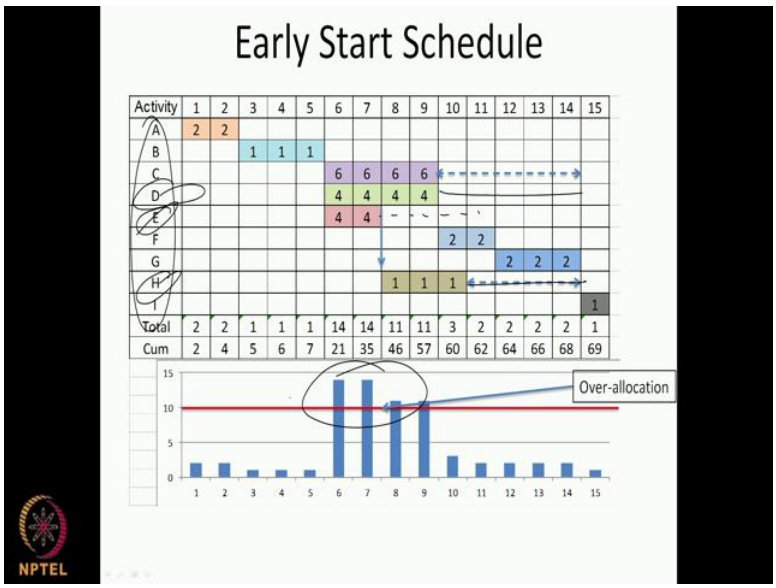

And we had worked this out for the over allocation problem, we had the activities you know A to A to I here. And if you go back, if you recall the critical path went is here A B C F G I was a critical path, activity D E, and H had float. And we were going to try to use the floats of these activities in the earlier exercise, we use the floats of these activities to resolve the over allocation problem. In here we are going to see again here we go activity D which has float, here we have activity D which has float, and then activity E has float, and activity H has float. So, we are going to try to move this, we remember we could move this, this way we move it here, and as and when H moved G could move to also also move the resource profile. So, based on these activities moving within the project duration using the float the profile of the resources changed, and that is what we are again trying to do.

So, in this particular case rather than resolving over allocation, we are trying to try to level the resources, try to make the profile as flat as possible. So, when we did this, what we had done in the in the earlier case was we move from this scenario, we had the resources which were an excess of what we was available.

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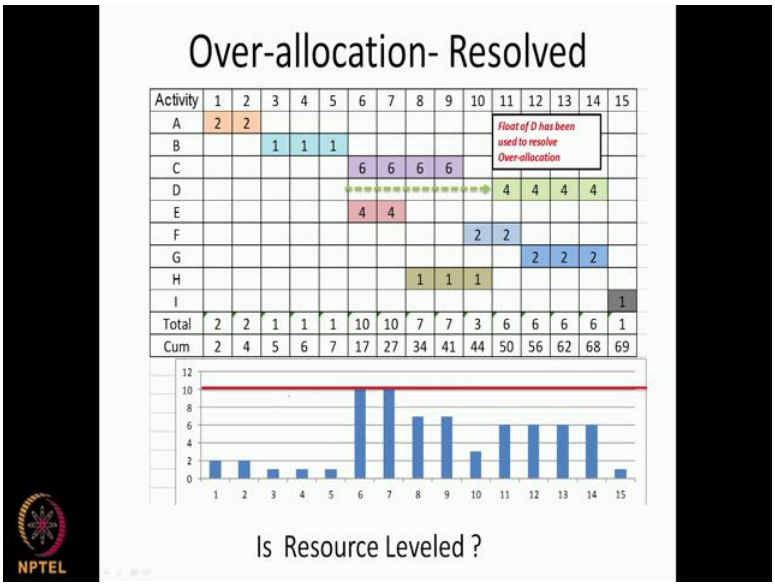

We were able to level it to scenario where we did not have any over allocation. So, this was moved, you know as you can see it has moved to where D moved. Now we have in some ways you can say yes, we have done some kind of leveling we have allocated the resources in such a way there is no more over allocation, but is this or is that leveling is one of the questions. And obviously, the answer is no, you can see the resource profile here, there is variation in resource profile, how can I bring this to as leveled profile as

possible, is that possible or not. So obviously, like when we talked about having perfectly level profile we have said that is ideal, but my question is how do we level it to the maximum extent possible.

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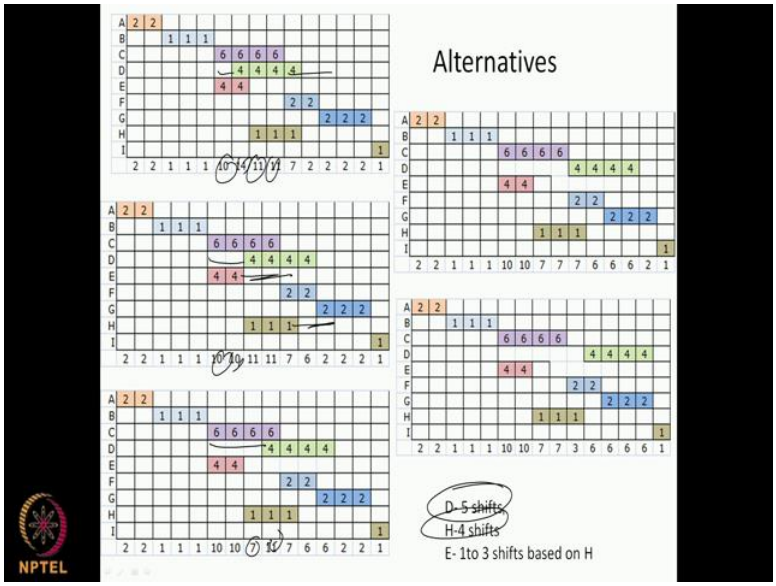

So, this is the basis on which we are going to kind of do some explorations. So, if we had looked at different alternatives. So, here you can see D is moving E within it is float, it is moved by 1 here, it is moved by 2 here, and here it is moved by 3. So, each of these steps as D moves you can see the resource profile is changing. So, here you have 10 and fourteen here you have 10 and ten, here D is moved down you have 7 and 11 from it was 11 11 became 11 and 7. So, as D moves the profile changes. Similarly you will find I can move H to change the profile. I can move E to change the profile. So, how do I keep changing the resource profile and how much should I shift these activities to get the profile which I want? That is the kind of issue which we are going to explore.

So, if you look at from the float perspective D has 5 shifts it can do, H has 4 shifts, and E has 1 to 3 shifts and it depends on how many shifts or it, because its following H, I mean because its preceding H it depends on how much H shifts for us able to shift E. So, if you look at the profile here or the number of options of shifting we can do, you will see there are several options. For example, I can you know, I can move I can keep H at same place E the same place and move D 5 by 5 steps, then I can move H by 1 E at the same place move D again by 5 steps. So, if I just keep E in the same place and I just move H and D, I have a total of 20 combinations of shifts I can do.

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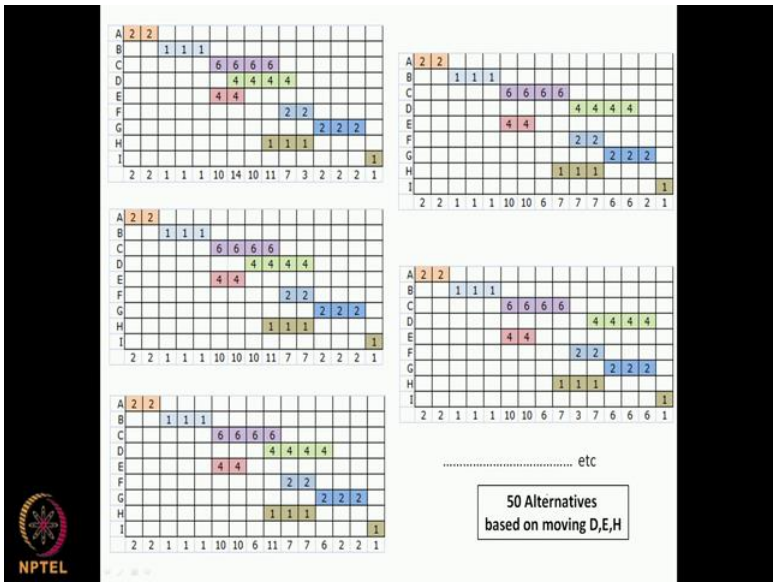

So, when we keep trying the various alternatives of what we can shift and what we cannot shift, you will find the there are in the number of steps we can there are 50 alternatives. So, this is somewhere somewhat about our solutions space, it is about 50 possible options have to be explored to be able to this see what our what our best resource profile we can get out of this is. And that is the flexibility we have with this current current CPM, current network. The way the durations and the relationships have been given to us that is the flexibility we have. We don't have any more alternatives and you can see that as we have several activities which have float in a in a network, the alternatives will rapidly multiply. So, even here with 50 alternatives it is possible to compute the resource profile for all 50, and then decide on which is the profile which I want.