Working Capital Management
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Lecture - 10
Operating Cycle

Welcome students. So now we will carry forward the discussion on this subject working capital management and in this class we will try to understand that how to estimate the working capital requirements of a company. Of any firm, of any manufacturing company how to assess the working capital requirements. How much working capital they require say to carry on their operations successfully.

This is the process and with the help of certain techniques or certain processes we can easily estimate the working capital requirements of the company and here we talk about the different techniques and ways how to calculate or how to work out the working capital requirement of the company.

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We can follow either of the 3 methods. So first is here is the current asset holding period method which is in a way called as the operating cycle approach. Second is the ratio of sales method and third one is the ratio of fixed investment method. So current assets holding period method or the operating cycle method or the operating cycle approach, this is very popular approach.

This is the very useful approach and say in most of the firms this approach, this technique is used to estimate the working capital requirements of the firm. So this is in nutshell or in the say simpler way it is called as the operating cycle approach. What is the operating cycle, how to calculate the operating cycle and the entire concept of the operating cycle I will discuss with you maybe in the following part.

But before that the second method is ratio of sales method. When you talk about the ratio of sales method, is very simple that we can take we could decide certain percentage of the sales that how much sales we are expecting to make for the for the whole of the year and as a percentage of that as a ratio of that we can decide that this much will be the working capital requirement. Now this can be done?

This can be done mostly on the basis of the existing firms and their working capital requirements. So for example if we are talking about a new company which is coming into existence for the first time, they are starting the manufacturing process for the first time so they want to assess the working capital requirement how much working capital they require so one method is that they follow the operating cycle approach.

But if they are not means interested to follow this approach then they take the ratio of the sales method from the firms which are already existing in the market. We can see that what is the size of different firms, what is the size of their sales in the market and as a percentage or as a ratio of the sales what is the level of the working capital the existing firms are using, the new firm can also start using the same proportion or the same percentage or little more or less than that and third method is the ratio of the fixed investment method.

Similarly, if sales we do not want to use then we can say we can use the ratio of the fixed investment. How much fixed investment the company is planning to make or how much fixed investment the other firms in the same industry have made in the fixed assets. So as a ratio of the fixed investment we can work out the say the percentage of the working capital required or the short term funds required. So if you talk about these 3 methods the method number 2 and 3 they

are not very scientific. They are only give us as a percentage, as a proportion which maybe not correct to some extent or to a large extent because ratio of sales method sometimes is very difficult to forecast the sales with the precision or maybe with the say true estimates.

Similarly, sometimes some firms as a ratio of the fixed assets it maybe some percentage in the one firm. It could be some percentage in the other firm. So these two are not very scientific techniques. So mostly that is why I told you, most of the firms resort to the first technique that is the operating cycle approach or the current asset holding period method. So now we will discuss in detail what is the operating cycle.

Say in nutshell before say discussing it formally, I would like to share with you that operating cycle in the simpler terms is that you see that you assume that when we have to manufacture a finished product anything you want to manufacture say for example this is the pen. This is the, we want to manufacture this pen, this is the finished product. Now this pen is requiring certain inputs.

First input is the raw material that is the steel, that is the plastic part, that is the ink and that is some other things. So this is the one thing is that we need to make investment in the raw material and then the other expenses like when you manufacture this pen so we have to have that people working on the plant so their wages will be important. Their salaries, people working in the offices will be important and say the total other inputs are also required.

Like we need power, we need water, we need other inputs, lubricants, oils for the say smooth running of the machinery plant and other manufacturing processes. So the cost of material means the total input. So what will happen? The total input when we are working out larger chunk of that input cost is on the material which is 50-60%. So first we will buy the raw material. So what will happen? We have, before buying the raw material we have the cash in our hands.

So we are investing that cash or converting that cash into the raw material. When the raw material comes to us that goes to the store and from the store slowly and steadily as per the requirement of manufacturing process. The raw material is issued to the manufacturing process

so when we start manufacturing it we do not directly convert the raw material into finished product but it is converted through stages.

So we convert the raw material into the working process and from the working process after further processing we convert that into the finished product. So it means first it was the cash. Cash was converted into raw material. Raw material was converted into the say inventory stage and from inventory it was issued to the manufacturing process. It was half processed. So when it was half processed it was working process.

And then from the working process we converted that to the finished product and now their finished product has to go to the market. So part of the finished product goes to the market on cash. So when we sell part of the production on cash in the market so it means we are we invested the cash and we got the cash back right. But part of the production will go to the market on credit.

And that production which is going to market on credit that will be known for some period of time as the accounts receivables or sundry debtors. Because till the time we are selling it on the credit in the market they will be called as the sundry debtors or the accounts receivables and after that when you collect the accounts receivables or sundry debtors then after the collection we will be getting the total cash back.

So it means operating cycle is the total time period which is say taken for investment of the cash and converting the means receiving the cash back. So it means we invest the cash means we make investment in the form of cash. Cash is converted to raw material, raw material to the inventory, inventory to work in process, work in process to finished goods, finished goods to sales on cash as well as on credit.

Cash means cash is with us but the credit sales which are sundry debtors, sundry debtors will be in the market for some period of time and after that we will also collect that cash on account of the sundry debtors also. So it means if we invested 100 Rs of cash our objective should be that not more at least 100 Rs should come back to us. So that time period which is taken for

investment of 100 Rs and then collection receipt of that 100 Rs back that total time duration is called as the operating cycle.

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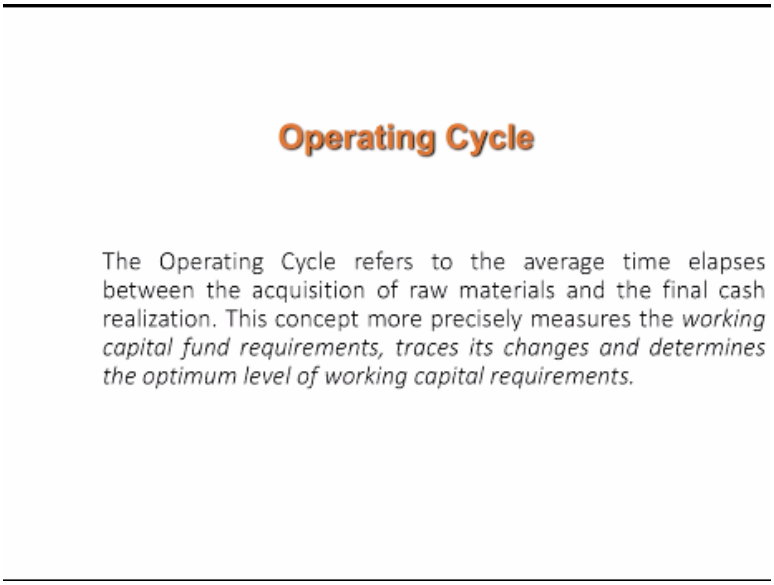

So if you look at this say ppt if you look at the slide what we have written here is that operating cycle refers to the average time elapses between the acquisition of raw material and the final cash realization. This is just what I told u. this concept more precisely measures the working capital fund requirements, traces its changes and determines the optimum level of working capital requirements.

That is the working capital fund requirement, traces its changes and determines the optimum level of the working capital requirements. So in nutshell it is the total time period which elapses that how much time it takes for conversion of inventory into cash. So first we invest cash and then we recover the cash back. So that time, total time period is called as the operating cycle. This is the operating cycle. If you see the operating cycle this is the operating cycle and we are in the first stage we are starting with the cash.

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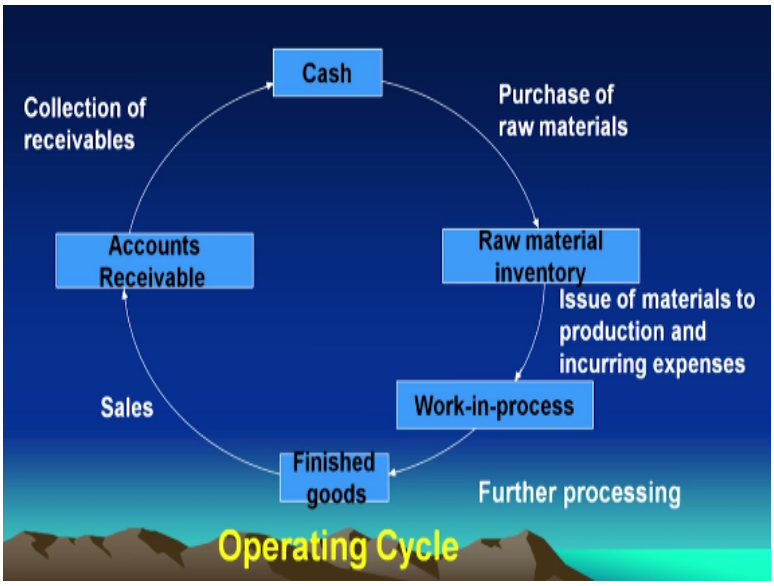

Cash is used to purchase the raw material and then that raw material goes to the store and it is called as the raw material inventory. Then we issue that raw material to the production process and along with the raw material and other expenses we start processing that material . So it is converted to the taken to the next stage which is called as the WIP stage or the work in process stage. Then that is finally processed and reaches at the next stage that is the finished goods stage.

And then if you look at the next part then those finished goods have to go to the market and we have to sell these finished goods. So if you have to sell these finished goods it means that will be converted into the cash and partly into the accounts receivables and accounts receivables means total sales have to be collected, partly we have collected which we sold on cash and partly which we sold as accounts receivables we will be collecting in the due course.

So it means we invested cash and we got the cash back. This is the say something which is called as operating cycle. So how much time it takes, how much time it takes when cash goes out of the say the account of the company and comes back to the account of the company that total time period is called as the operating cycle. Now you see the stages of the operating cycle. We have the 4 stages of the operating cycle.

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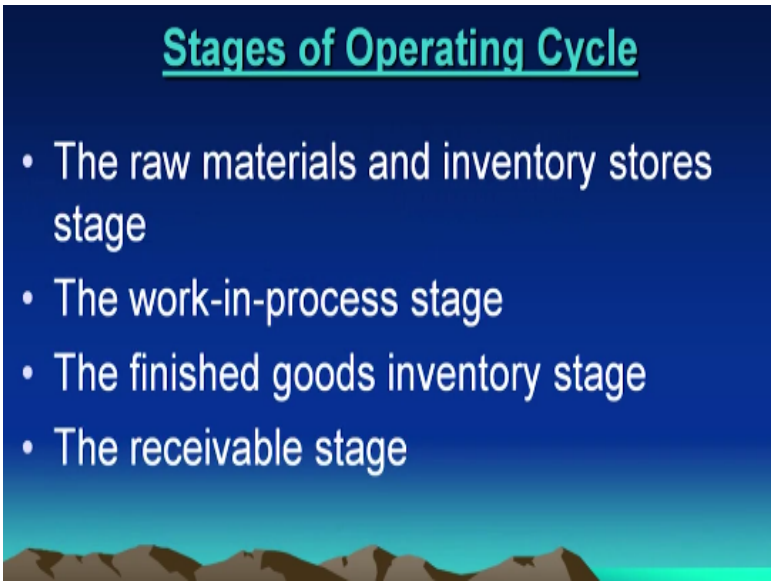

Raw material and inventory stores stage. When we buy the raw material we convert the cash into raw material and raw material becomes the inventory which is stored in the warehouse or in the store or in the godown and till the time it is stored it is at the inventory stage. Then we keep on issuing or we will start issuing the raw material to the manufacturing process and by adding up other expenses we convert that into the say semi-finished stage, semi-finished process.

And that is called as WIP work in process stage and then when we further process it then it becomes the finished goods. So third stage is the finished goods inventory stage and that finished goods inventory goes to the market so what happens. Say for example out of the total production 50% we are selling on cash. So 50% we immediately recovered. But remaining 50% will be converted into from the finished goods to the receivables or sundry debtors.

So that will remain receivable or sundry debtor for some period of time or maybe the time period given for say for the collection of the debtors or time period allowed to the buyers on credit that is to the sundry debtors and once on the expiry of the credit period when they make the payment to the company so it means the total cash which we invested we have to recover that plus profit on that.

So that time period is called as the operating cycle which is having the 4 stages and 4 stages means first stage begins with investment of cash and the last stage ends up with the recovery of the cash.

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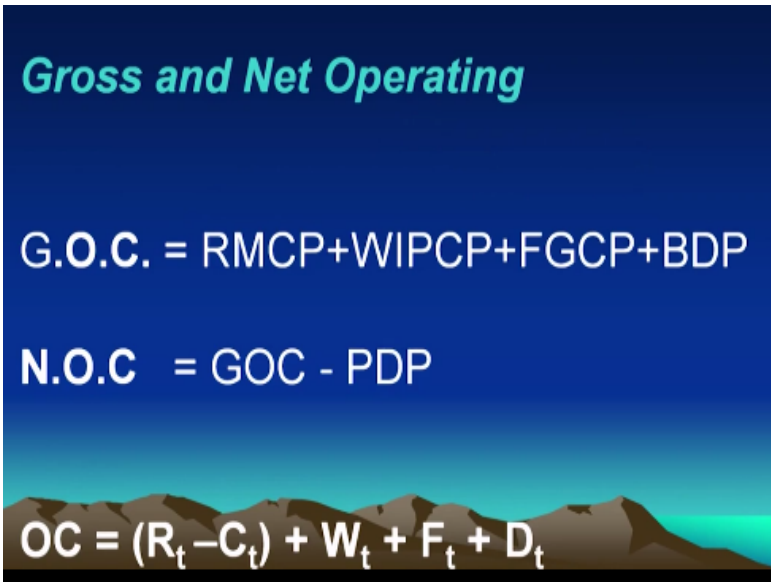

So it means when you call it the operating cycle we have 2 kinds of the operating cycles, gross operating cycle and net operating cycle. We have gross operating cycle and net operating cycle.

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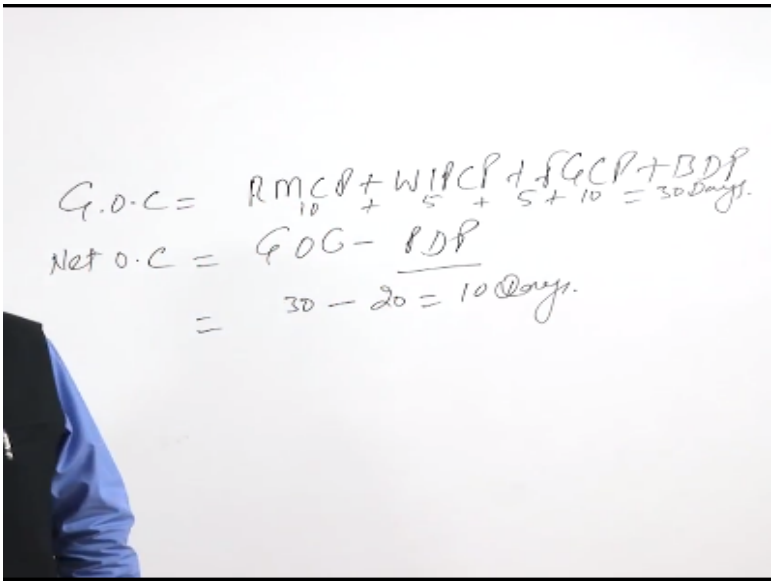

So first it is the gross that is gross operating cycle is GOC and then we have the net operating cycle. This is NOC net operating cycle. So what is the net operating cycle that is GOC minus

PDP and here what is this. This is the sum total of the 4 stages which we saw in the previous slide. We have the 4 stages of say total investment of cash and recovery of the cash.

First stage is raw material conversion period that is called as RMCP, raw material conversion period plus WIPCP work in process conversion period then is the FGCP finished goods conversion period and then last stage is the BDP. BDP is what we call BDP? BDP means book debt period. The credit period allowed to the buyers who want to buy it on credit.

So sum total if this is the raw material conversion period plus working process conversion period, finished goods conversion period and book debts. So it means for example raw material conversion period is 10 days plus here it is 5 days plus it is again 5 days and then is the 10 days. So it means the length of operating cycle is how much that is 30 days. In total 30 days we will be converting the cash back into the cash.

We will be converting back cash into the cash so this is the duration of the operating cycle. Now we call it as net operating cycle. Gross operating cycle minus PDP. What is PDP? PDP means the payment deferral period, time period which is allowed by the suppliers of raw materials to the firm that you buy the raw material on credit and after the expiry of say 2 months or 45 days you can make the payment to us.

So that is called as the credit period allowed by the suppliers or in the other terms we call it as the payment deferral period, whether you are allowed any payment deferral period or not. if no period is allowed it means we are buying the raw material on cash. But if the payment deferral period is allowed then that is called as the PDP. So it means how many days PDP is allowed by the suppliers.

So for example we have calculated here the gross operating cycle is say 30days and PDP is allowed say 20 days. So it means net operating cycle is 10 days. This is 10 days. It means you only are investing the cash only for a period of 10days because out of this total period of 30days we not need to pay anything to the suppliers of raw materials. They are allowing us the credit period of say 20 days.

So we will pay them after 20 days and after next 10 more days we will convert the total investment back into the cash. So actual duration of the operating cycle is what? That is only 10 days. That is only 10 days. It can be now the question arises. Can net operating cycle be negative also? Yes, net operating cycle can be negative also. So for example the firms who have a very good credit rating in the market who are the bulk buyers of different kinds of the raw materials.

Their raw material come from say different suppliers and one supplier who is a not a very big size supplier, he supplies his total production to the one single buyer. So in that case he is also very means comfortable that whatever he is producing 100% of his output is going as a raw material to the another company and he is not required to look for the other customers.

It means he is safe, he is peaceful and he is also very happy to do the business with the big buyer who is buying from that supplier and maybe from the many other suppliers. So in that case the only requirement of that big company the large company is that they want a longer credit period. They want a longer credit period. Now for example you talk about the car industries in India and we take the example of Suzuki Motors, so Maruti Suzuki Motors.

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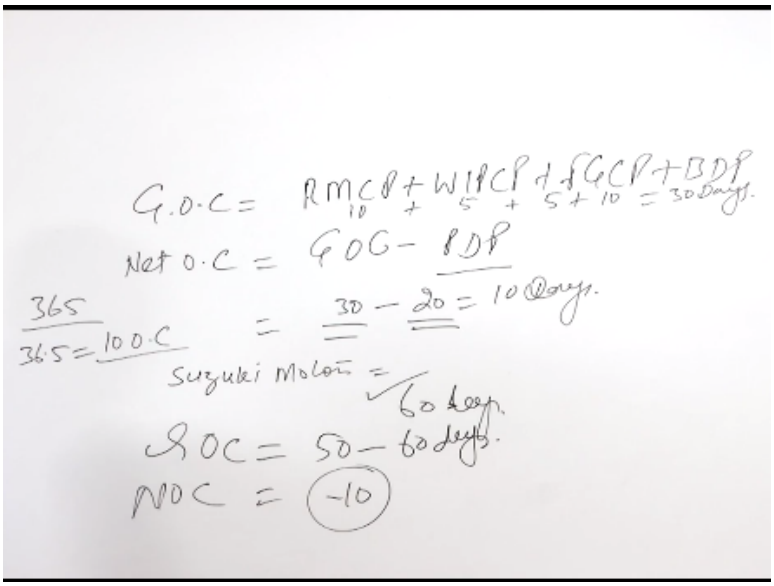

So it means when you talk about the Suzuki Motors case, Suzuki Motors is manufacturing cars in India, is a very say well-known name, means cars in India is synonymous to the Suzuki Motors

of the Maruti Suzuki so it means that is a very big company. Now this company is only manufacturing themselves they are manufacturing is the gearbox of the car. Other all inputs are coming from the small suppliers or different suppliers.

For example for manufacturing a car we need steel, we need rubber parts, we need glass, we need say seat covers, we need wheels, we need say tyres. So everything is required and they do not manufacture tyre. Somebody else is manufacturing wheel. Somebody else is manufacturing steel. Somebody else is manufacturing rubber parts. Somebody else is manufacturing glass.

Somebody else is manufacturing so it means Maruti Suzuki is buying all these inputs from the different suppliers. Now for example there is one supplier who is manufacturing the say rubber parts which you can call it as the rubber gaskets which are used to to fix up the window panes. So for fixing up so that it remains stuck and they are also used for say say on the doors also so that door properly shuts and the car can people can be comfortable inside the car.

There is no air coming in and going out. So rubber parts for example some company is manufacturing and they are supplying their 100% production to the Maruti. So in that case Maruti may say that yes your product is acceptable to us but only condition is that we want a credit period of say say 2 months, 60 days, 60 days credit period. We will pay you after 60 days. It is no the problem.

You can sell to us for 60 days credit period and your 60 days interest cost you can add up into the price which we will pay to you. So after 60 days when we will make you the payment of your bill or your invoice we will make the payment. We will pay you that is for the principle plus interest. So you add up it in the total price which you are quoting to us. Now total payment deferral period in this case to the Maruti is 60 days.

And for example in this case they get say nod from all the suppliers; steel, then your glass, your rubber parts, your wheels, your tyres everybody is ready to give the credit period to Maruti of say 60 days. Now in return Maruti gives a credit period to its suppliers 60 days. So in the case

total for example you can say the total gross operating cycle for the Maruti works out, the GOC for the Maruti works out as 50 days.

And they are able to take the PDP payment deferral period of 60 days from the all input suppliers. So it means in that case the net operating cycle or NOC for the Maruti will be minus 10 days. It means they are starting the manufacturing process. A lot of car they are manufacturing and that lot is going to market. They are converting that into cash into 50days. Whereas to their all suppliers they are paying after 60 days.

So it means the total payment which they are investing at the beginning of starting of the manufacturing process of say 100 cars it is only taking 50 days and they are selling in the market recovering the total funds within 50 days everything is done and they have to make the payment after 2 months to their all suppliers. So it means the net operating cycle for the Maruti is negative. So it means operating cycle can be negative also, that is the net operating cycle.

But the gross operating cycle can never be negative. Only net operating cycle can be negative when the payment deferral period is more than the total duration of the GOC.

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Gross and Net Operating

G.O.C. = RMCP+WIPCP+FGCP+BDP

N.O.C = GOC - PDP

$$OC = (R_t - C_t) + W_t + F_t + D_t$$

So we have the equation here the last equation that is R t minus C t. R t is what is R t? R t is the raw material conversion period and C t is the payment deferral period because normally the raw

material suppliers give the credit. Large credit comes from the raw material and raw material is the major chunk of the total cost of production also. So R t minus C t plus the WIP duration that is WIPCP plus F t is the FGCP plus D t is the book debt period.

So it means total of this makes the operating cycle and this is the equation for the net operating cycle because we have already subtracted the payment deferral period as C t from the R t which is the raw material conversion period; so gross operating cycle and the net operating cycle. For our use and the finally for the final use we are more concerned about the net operating cycle not about the gross operating cycle.

But you cannot calculate the net operating cycle directly until and unless you calculate the gross operating cycle. So this way we can calculate the operating cycles. For example you see that we have material wages and overheads. These are the 3 major inputs required for converting the raw material into the finished product right.

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period in weeks

Particulars	Materials	Wages	Overheads
RMCP	1	1	1
WIPCP	2	2	2
FGCP	1	1	1
BDCP	1	1	1
G.O.C.	**5**	**5**	**5**
Less: PDP	1	1	1
N.O.C.	**4**	**4**	**4**

So we have seen we have calculated the period in weeks. So one is the raw material conversion period is that is say is taking 1 week in total for material, wages, and overheads. WIPCP is taking 2 weeks that is the working process conversion period, 2 weeks .There is the finished goods conversion period is 1 week. Then is the book debt conversion period is again 1 week. So total

length of the gross operating cycle is how much that is 5 weeks and less PDP payment deferral period say for example it is allowed to this company is 1 week.

So it means net operating cycle for this company is the 4 weeks. So this way we can calculate the operating cycle which is an important concept.

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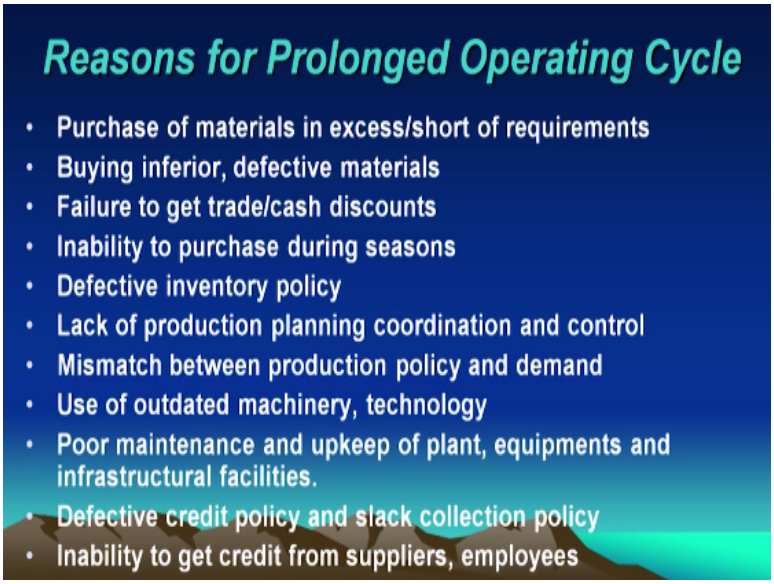

Now we will talk about say how to shorten the operating cycle. Because approach of every company should be that their operating cycle should be as short as possible. Because in one year we have how many number of days, 365. So in 365 for example if some company's operating cycle is of say 36.5 days. So in a year how many operating cycles the company would be able to complete that is 10 operating cycles, 10 operating cycle, 10 OCs.

And for example if the company's some company's operating cycle is comes down to 18 days, so it means how many operating cycle? Roughly the company would be able to complete the 20 operating cycles in a year. So ultimately we have to shorten the operating cycle. We have to fasten the manufacturing process and shorten the operating cycle so that the company is able to do the maximum business, maximum production and market sales in the market.

But the length of operating cycle depends on many factors. It is not always in the hands of the company. Sometimes manufacturing process is so that minimum time is required to be given. If

you are not using the minimum time, if you are not taking the minimum time the product quality cannot be assured. So for making the product as a quality product or converting the raw material into finished quality product we have to spend minimum time because ripening of that say finished unit takes time and nobody can do anything.

We have different kind of technologies. We have different kind of processes but minimum time is required. Only thing is we can save up on the wastages. We can save upon the say availability of or we can ensure the regular supply of inputs like electricity is the limiting factor. Sometimes your water is the limiting factor. Sometime your labour is the limiting factor. Sometime a specific type of the raw material are limiting factors.

If these are the limiting factors then nobody can help it out. Even despite the fact that we could have shortened the operating cycle but we are not able to do that because of certain reasons. So in this case say first here we have identified the reasons which prolonged the operating cycle. Say what are the reasons? Purchase of material in excess or short of requirements. Similarly, buying inferior or defective materials. Then failure to get trade or cash discounts.

Inability to purchase during seasons. Defective inventory policy. Lack of production planning coordination and control. Mismatch between production policy and demand. Use of outdated machinery, technology. Poor maintenance and upkeep of plant, equipments and infrastructural facilities. Then defective credit policy and slack collection policy. Inability to get credit from suppliers or employees. These are some reasons which have been identified.

If we want to shorten the operating cycle what we have to do is that we have to remove these reasons and we will have to or if we cannot fully remove these reasons we can minimize the effect of these reasons. For example purchase of raw material in short requirement. We should have sufficient production and the purchase process should be like that raw material we are buying but not too much, not less.

We are buying a optimum quantity of raw material so that the continuity of the production process can be assured. Similarly, if you are buying a defective raw material or inferior raw

material naturally the say processes will take more time and it will be say very difficult to convert that raw material into finished products as quickly as possible.

Similarly, when you are not able to get the cash or trade discounts where we are ending up paying more price, it will become expensive purchase for us and if you are investing more amount you have to recover that more amount from the market. So it may take some time. So we have to remove these reasons and if we are not fully removing but even minimizing the effect of these reasons even then we will be able to shorten the duration of the operating cycle. And then say finally how to reduce it. Proper purchase management.

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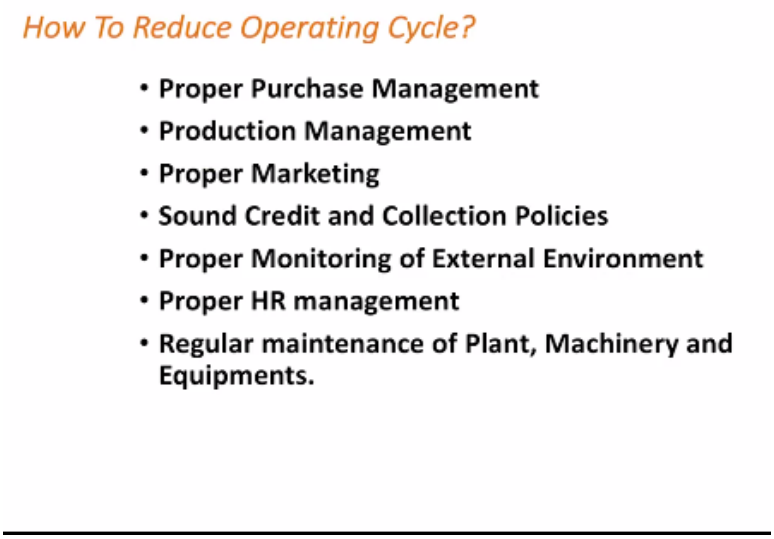

We should properly identify that where is the raw material available. How much time it takes from the place of raw material to the place of use that is the manufacturing unit and if it agricultural based product or the raw material is say based upon the agriculture product is a kind of agricultural product in that case it is better to buy during seasons because it is very cheap at that time and a good quality of the material can be purchased.

For example you talk about we take the example of say your this multinational companies like Pepsi and others who manufacture the potato chips. They buy is a agricultural based product, potato. They buy the potato from the place where the best potato is available and they buy during

season they store it and then they finally convert into the finished product. Similarly, you talk about the ITC.

ITC that Indian tobacco company which manufactures many products which are based upon the agriculture raw material or raw material coming from the agriculture sector. So they buy in bulk. They have permanent supplier. They have permanent say growers of their raw material maybe say tobacco, maybe it is say wheat or maybe it is anything. So they are buying during season. They are buying it from permanent sources.

They are helping them to grow the good quality of the output. So it means their operating cycle will be under control and as short as possible. Say production management is also important, marketing is also important. Because if you are selling more on cash rather than on credit so it means finally we would be say ending up shortening the operating cycle. Similarly, sound credit and collection policies, proper monitoring of the external environment, HR management.

Efficient human resources if we have, trained human resources if we have and then is the regular maintenance of plant and machinery and other equipments. So these are some ways and means how we can shorten the duration of operating cycle and if we are taking care of all these factors and all these things so what will happen that ultimately that time period will be in our hands and that it can be shortened.

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So it means some factors which have to be borne in mind are the seasonal variations, accuracy of sales forecast, investment cost, variability in sales, length of operating cycle, and credit and the collection policies. They are some important factors which are affecting the length of the operating cycle. So if reasons are identified and removed if some important steps are taken seasonal variations are taken care of.

And if the demand forecasting is correct then there is no doubt that we cannot shorten the operating cycle or we cannot bring it down to the optimum level where we can say that yes operating cycle is the as short as possible is the optimum operating cycle and our investment of cash we are able to convert that back into cash in the minimum possible time. So this is the just the beginning of the concept of operating cycle, what the operating cycle is and how it helps in the estimation of the working capital requirements.

Many other things regarding the operating cycle and how to calculate the operating cycle we will discuss in the next class. Thank you very much.