Working Capital Management
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Lecture - 13
Working Capital Requirement Assessment - II

Welcome students. So in the previous class we were discussing the estimation of working capital requirement the process of estimation of the working capital requirement and we saw that based upon the length of the operating cycle that to the weighted operating cycle how to access the working capital requirements of a company and finally we tried to learn that with the help of a formula we can assess the total working capital required over a period of time or in the 1 operating cycle.

So we saw that, that was a cost of goods sold per day multiplied by the weighted operating cycle that the duration of the weighted operating cycle plus cash and bank balances. If you use that formula you can assess that for a firm for which we are working or anybody is working and he is in the finance department he want to assess the working capital requirements of that company.

So that way he can assess or he or she can assess that this much is the working capital requirement of the company in the given one operating cycle. So multiplying by the number of operating cycle in a year you can see you can easily calculate how much working capital how much short term finance will be required.

So carrying the process forward in the same direction we will be now discussing some problems that how to assess the working capital requirement by using the duration of the operating cycle or different stages of the operating cycle like raw material, work in process, finished goods, debtors, accounts payable all these durations if you are if you are able to successfully work out these durations.

Then we can estimate that in the one operating cycle how much raw material is required, how much manufacturing expenses are required, how much selling administration and financial

expenses are required or how much will be the say selling price. So we will be able to easily find out. We will be able to assess it. But the base of this estimation is also the operating cycle.

That if we have correctly estimated the duration under the operating cycle that is the duration of raw material or the work in process or finished goods or debtors then I think it will not be difficult for the firm but again it is a point of caution. I am cautioning again that this is only going to give us a broad estimate of the working capital requirement of the firm. This is not the final figure.

That figure is that we are going to arrive at the say figure nearest to the accurate figure but accuracy has to be achieved by internally adjusting these figures we are going to work out and then finally we can make out that something more or something else as compared to this we have worked out will be the actual requirement of the firm. So let us discuss the problems. Here I have say uploaded 5 problems.

Out of this I will solve 3 and remaining 2 you can do yourself and then you can refer to different books where these problems available are given and then you can be clear about the concept of say estimation of the working capital requirement by following the concept of operating cycle. So let us discuss the problems. This is the first problem with us and this problem says that.

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- **PROBLEM 1:**

Micro care plans manufacture and sell 30,000 units of their product next year. The expected cost of production is as follows:

	Rs. (Per Unit)
Raw Materials	100
Manufacturing expenses	30
Selling, administration & financial expenses	20
Selling price	200

The duration at various stages of operating cycle is expected to be as under:

Raw material stage	2 months
Work-in-progress stage	1 month
Finished goods level	½ month
Debtors	1 month

Required:

Assuming the monthly sales level of 2,500 units, estimate the gross working capital requirements if, the desired cash balance is 5% of the gross working capital requirements and W-I-P is 25% with respect to manufacturing expenses.

the different components of the say manufacturing process are available with us that is raw material, manufacturing expenses, selling, administration and financial expenses. Then we have selling price that is given to us and then we are given the different durations of the operating cycle that raw material remains as a raw material for a period of how many months, 2 months. Work in process remains in the stage of work in progress for a period of 1 month.

Finished goods take half month to say convert into sales and finally sales partly maybe on the cash but partly around the credit and the credit period allowed is 1 month. So if you look at the duration of this operating cycle given in this problem this works out as how much 4 and half months. So total duration is raw material stage, work in progress stage, then finished goods stage, then is the debtor stage.

So cash we are for example if we are investing cash today then after 4 and half months this company will be able to recover the total cash back so it means it does not happen that one operating cycle will start after the another means second operating cycle will start once the first is finished. That does not happen. Many operating cycles simultaneously start and the production process being a continuous process so what happens?

That when the first stage of raw material when it moves from the warehouse to the plant then we replace that material with the new material which is coming from the supplier's place to our warehouse and when it moves from the one say process and the manufacturing process from the one process to the next process then the previous process is also replaced by the material coming from the warehouse.

When it moves from the first process to the second or the final process then that first step is also replaced by the new material coming from the beginning of the process. So that it is a continuous process. It does not mean that if the operating cycle's length is 4 and a half months it means in a year firm will be able to complete somewhere around say 2.5 or maybe around 3 operating cycle that does not happen.

Because it is a continuous process so 4 and a half we are not going to wait for one operating cycle to complete in 4 and a half month then only the second will start. It is a continuous process but normally we can say that one lot of production which we will start on any date in a year that will take that the cash invested in that that will take to again come back to you in 4 and a half months.

So we can understand that how much working capital can be required by the firm. So in this case we are given the figures and we are given on the basis of say raw material, work in process stage, finished goods stage and the debtor stage. So if you calculate I think it is written here also that assuming the monthly sales level of 2500 units estimate the working capital requirements if the desired cash balance is 5% of the gross working capital requirements and work in process is 25% with respect to the manufacturing expenses. So it is a point of say to be noted.

It is important point say I told you in the previous class that normally while calculating the value of the work in process we take full cost of the material whereas the manufacturing expenses or the processing expenses are taken as half if nothing is given to us. But say for example in this problem it is clearly given that manufacturing expenses will be 25% means 25% will be only required at the work in progress stage.

And remaining 75 will be say after when it moves to the final stage then remaining 75 this 75% manufacturing expenses will be required. So it means it is clearly given. If nothing is given then we have to take the manufacturing expenses is half 50% but in this case it is clearly given it is 25%.

Similarly, the desired cash level is cash balance level is in the previous class also we saw that say when we are calculating the working capital requirement we are say having cost of goods sold per day multiplying by the length of operating cycle it was 64 days and then whatever the figure comes into that we are adding the cash balance. So here also we will do that first of all we will see that at the raw material stage how much capital will be required.

At the work in progress stage how much capital will be required looking at the cost of the raw material manufacturing expenses and other processing expenses and the duration of the say different durations of the operating cycle. So how much investment will be required in the raw material stage. How much will be required at the work in process stage. How much will be required at the finished goods level.

And how much will be required for the say selling on credit and as debtors supporting the debtors or the credit sales how much capital we require. So it means when we calculate the working capital we assume that in a given period of time we create current assets right and those current assets are partly funded by the current liabilities and the different between the current assets minus current liabilities comes from the long term sources.

Because that is the only net working capital. In this problem when we will solve this problem we are given the information in such a way that only it is requiring the creation of the assets current assets but not even a single penny is coming from the current liabilities. That is why it is clearly written assuming the monthly sales level of 2500 units, estimate the gross working capital requirements, gross working capital requirements is clearly given.

So gross working capital requirement means otherwise it would have been written as net working capital requirement. So it means no penny is coming from the current liabilities. So it means we are to create the current assets. But nothing will be coming from the current liabilities as spontaneous or short term finance so it means this is a gross working capital requirement and entire amount, entire amount which we will work out now will come from the long term sources.

So gross current assets means funding of the total gross current assets will be from the long term sources so entire amount is a gross working capital or you can say it is nothing coming from the current liabilities so it means total investment has to come from the sources other than the current liabilities. So let us now work out the say this process we will follow a process and we will work out that how much investment is required at the raw material stage.

Because raw material is remaining as a raw material. Say when we purchase the raw material when it comes to the firm or the warehouse of the firm it stays there but remains as a raw material or we have to keep the stock of the raw material for a period of 2 months. So when you are keeping the material for 2 months you have to support it with the financial investment. So it means for 2 months your funds will be blocked in the form of material.

Then it will move to the next stage to work in progress stage so it will be blocked for 1 more month. And then it will be material cost plus the 25% of the processing expenses and then when you move to the next stage that is the finished goods stage then half month will be means 15 more days will be required to block it or it will be blocked for 15 more days and then when we sell it in the market the part of the production which we sell on credit that will be blocked for 1 more month.

So it means total investment which we are making in creation of these current assets will be blocked in 1 operating cycle for a period of 4 and half months and then we will be able to liquidate it or to convert or get the cash back what we have invested that we will be able to get back so it is a normal period of the 4 and half months. That is the duration of the operating cycle. So now taking the or making the use of this say cost information as well as the operating cycle information we will now work out the say working capital requirement.

And as I told you since nothing is coming from the current liabilities so total funds will be calculated in the form of the gross working capital requirements and they will come from the long term sources. So now we will prepare a statement of the working capital requirements and in this case we will prepare a statement which is called as a statement of working capital requirements. So let us prepare the statement.

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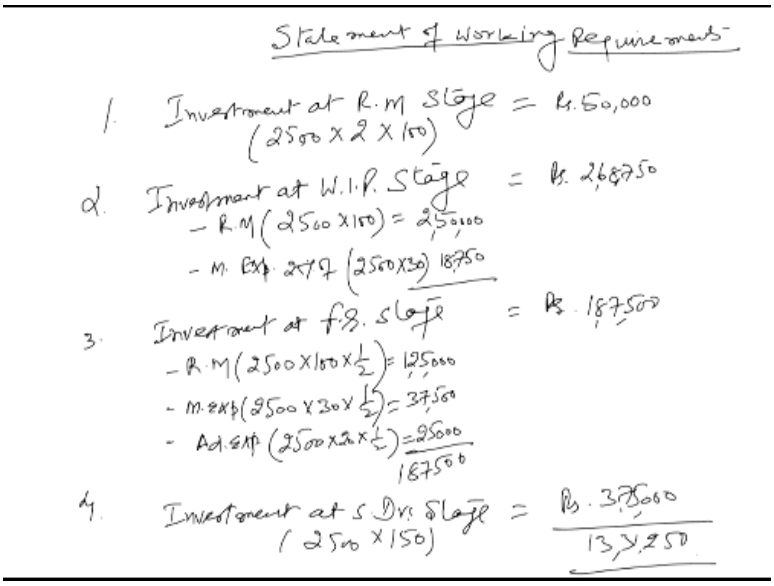

This is the statement of working capital requirements. So we are going to prepare this statement and for this we have to have the we have to work out the total investment at the different stages and when you work out this total investment at different stages so it means number one is the investment at raw material stage. Investment at raw material stage. So we will have to work out this investment. How much investment we are going to make?

Now let us see back if you if you see here raw material is raw material is say 100 Rs per unit and how much is going to be the total production? Total production is going to be 13000 units per year and it is written here that 2500 units are expected to be produced uniformly every month. So it means monthly production is 2500 units. One unit's raw material requirement is 100. So let us see and the it is going to be blocked for a period of 2 months.

So let us see how much investment is required here and for this if we work out this requirement so how to calculate this requirement? It will be something like this. How many units we are going to produce 2500 units and what is the period for which it will be blocked. It will be blocked for a period of 2 months and what is the cost of 1 unit of raw material that is 100. So it means this is going to be something going to be the cost of raw material and here it is the cost of raw material is Rs 5 lakh.

Now the second stage is investment at WIP stage, investment at WIP stage. So how much investment we are going to make at the WIP stage. It is written here as that we have to take 100% of the raw material cost and the manufacturing expenses will be 25% only. So let us see how much it works out. We will calculate here as number 1 is that is raw material. Raw material is how much? We are producing 2500 units. Raw material is 100.

So how much it works out as this is total requirement is going to be 250000. This is one component of the WIP cost and second component of the WIP cost is the manufacturing expenses. So manufacturing expenses are how much. We will have to calculate manufacturing expenses are you can say that is 25% of 25% of something like 25 into what is the manufacturing expenses, let us see the manufacturing expenses here.

We have the manufacturing expense is 30. So it means 30, 25% of 25 into 30. So how much is going to be this amount. This is going to be 18750. This is going to be the amount of 18750. So it means how much is the requirement at this stage? 2 lakh rupees, 268750. This will be this much investment will be required at the WIP stage and then we go for the third stage. Third stage is the finished goods stage. Investment at finished goods stage.

So we will have to calculate now this investment rupees something which will work out. We will see that how it is calculated. So raw material will be how much? Raw material investment will be if you see this is going to be how much, 2500 units and at the rate of Rs. 100 and for how much or half a month. So it means if you calculate this, this works out as we will keep it in the inner column and this works out as 125000. This is the investment in the raw material.

We are going to have this investment in the raw material. So we will have to go for this investment. So to say 125000 is for the raw material and then now see manufacturing expenses. Manufacturing expenses at this stage are going to be how much, 2500 and into 30. We have to take the total now here 30 and that is for a period of how much half a month. So we will take half of it. So it works out as 37500. This is 37500.

So total amount we have worked out here is how much? That is 125000 and 37500. This works out here as sorry we will have to make one change here that say finished expenses. So in the finished expenses we have given something else also. If you look at the finished expenses total is the manufacturing expense we have 30 and then selling and administrative expenses are 20. So we will be taking here as the total amount is manufacturing expense is 25.

And we have one more head here. So one more head is the administrative expenses. So we will take the administrative expenses also. So third head is add into this we will have to add in the administrative expenses. Because administrative expenses are also required to be included in the finished goods. So 25 into 20 into one and a half again. So this works out as how much? This will be somewhere the total amount will be 25 into 25 into 20 that is 50.

So again this amount will come out as 25000. So total amount will be this is 25000. This amount is 25000. So we will take the total cost. Now how much is the total cost here. This is the if you calculate the total cost of the finished goods, total investment required at the finished goods stage this is 0, this is 0 this is 5, and this is say this 7 and then this is going to be how much 0. This is going to be 0. Then we have taken the 5.

Then we have taken 7 and 12 and then it is 5. If we calculate this works out as 17; 17, 1 and then it is 4 then it is 5, 2. This total amount is going to be 5, 2, 7, and 8. So this is 187000. Total investment required at this stage is 187500. This is the total requirement at the this stage and then we go for the investment at investment at this is the investment at debtor's stage. So investment at sundry debtors stage.

How much is going to be the investment at sundry debtor's stage? That is going to be say total units are 2500 multiplied by 150. We will take the sundry debtors here for calculating the investment requirements. We will take it as 150 not that at the selling price but at the cost price. So this will work out as some amount and this is the say 375000, 375000 is going to be the cost here. So this is the investment in the sundry debtors.

Now we will have to calculate something means total requirement we have calculated so far is before the cash balance is if you take the total investment requirements before cash, how much is going to be this investment requirement that is 500000; 2,68,750; 1,87,500; 3,75,000. So this total investment works out as how much 13,31,250. This is the total requirement. But this is not the working capital requirement, final working capital requirement.

Into this you have to add some amount as cash. So what is the cash requirement here? So say requirement our next requirement is one that is we have calculated 4. So this is going to be the 5th requirement cash and bank balances, cash and bank balances we are going to keep.

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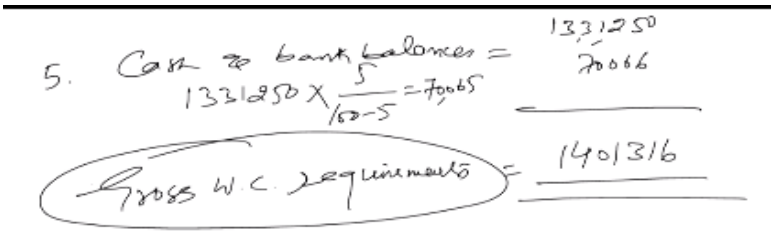

And how much is the cash and bank balances required. We had the total amount. We have to calculate it, how we can calculate? You can calculate it like this for example the investment requirement before cash was how much 13,31, 250 and it is the it is written clearly. What is written in the problem is that estimate the gross working capital requirements if the desired cash balance is 5% of the gross working capital requirement.

So gross working capital requirement will be worked out after adding the cash. So we have calculated the investment at the 4 stages. Fifth stage is keeping the cash and bank balances. So that will be gross. So it means without cash it is only 95%. So up till this stage we have calculated, this is only 95%. So it means for making it 100% we have to add the cash and bank

balances and for adding the cash and bank balances here how much it will be that 13,31, 250 and we will take it as 5%.

So 5 divided by this 100 - 5. So it will be the total amount which we will work out here is that amount will be something like that 70065 Rs. 70065 Rs you will add into this. So what was the balance till date? This balance was if you take the balance forward so that balance was 13,31,250. 13,31,250 is the balance till now and in this you have to add something that is 70065. 70065 if you add so it means finally your gross working capital requirement will be how much?

Your gross working capital requirements, your gross working capital requirements will be something like this. Your gross working capital, gross working capital requirements will be 14 lakhs one hundred and 14,01,316. So this works out as the total amount here. If you calculate the total amount this will be say this is the amount not as finally if you take the final figure if you round it off then what can you do here is that this is the not 65 but it is 66.

So this is going to be the 66 so that is why it is 6. Then it is 1, then it is 3, then it is again the this 1, and then it is 4, and this is this. So it is going to be 14,01,316 is going to be the gross working capital requirement of the firm on the basis of this information given to us. So this is gross working capital requirement. Why we are calling it as the gross working capital requirement.

Because this is the total amount which we require to create the current assets at the different levels say for example investment at the raw material stage will be this much, at the WIP stage will be this much and then the investment at finished goods stage will be this much and the sundry debtor stage will be this much. This is the investment requirement means the creation of current assets. But how much will come from the current liabilities that is 0.

Nothing is coming from the current liabilities from the short term or the spontaneous finance nothing is coming. So in this case the gross working capital requirement is 14,01,316. So entire amount has to come form the sources other than the spontaneous or the short term finance which is we know it that it is going to be the long term finance. Total short term investment has to be created or to be made from the long term sources.

Which is going to be a very expensive affair which is going to be a very costly affair for the firm. But if they are not able to generate any funds from the spontaneous or short term sources in that case they will have to arrange the funds from the long term sources and for the time being they have to compromise with the profitability. However, firm will have the good or the sufficient amount of the liquidity.

Because their entire amount is called as the net working capital. If this is the gross working capital this is the net working capital because current liabilities are 0. So it means the say final amount which is coming from the long term sources so there is no risk of liquidity if the firm is able to manage the funds from the long term sources but because there is no risk so ultimately firm has to pay a very high cost. So high cost will be affecting the profitability of the firm.

So this is how we can invest the or we can estimate the working capital requirements of the different firms or different companies. So this is the first problem we could do and we could understand that if no current liabilities are there then how much is the investment in the current assets total requirement has to be fulfilled from the long term sources. So now we will move to the next step further.

And that step will be that to do a problem out of these 5 where we have both the things, current assets also current liabilities also and we can say that we will have to work out the net working capital requirement that how much net working capital is required we have to estimate that. Again we have to use the information given in terms of investment, in terms of duration, in terms of the funds going to be available from the short term or the spontaneous sources.

So total investment we will work out like this as we worked out in this problem. Then we will assess that how much funds will be available from the current liabilities and then what will be the difference. That difference will be called as the net working capital which will come from the long term sources. So we will move to the next problem here and for that in that problem we will have to think that which problem is more useful for us to do.

If you see the problems here you can say that first we have done and then in this case second one is also not very typical you can easily do it yourself. Probably we do the things to some extent here and then we will move to the next level that is the problem number 3 and then problem number 4 and then we have the problem number 5.

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- **PROBLEM 4:**

ABC Ltd. manufactures consumer products. Company produced 1million units in the previous years 2017. The same level of activity is intended to be maintained during the current year..

The expected ratios of cost to selling price are:

Raw materials	40%
Direct wages	20%
Overheads	20%

The raw materials ordinarily remain in store for three months before production. Every unit of production remains in the process for two months and is assumed to be consisting of 100% raw material. labor and overheads. Finished goods remain in warehouse for three months. Credit allowed by creditors is four months from the date of delivery of raw material and credit given to the debtors is 03 months from the date of dispatch.

The estimated balance of cash to be held has been $2.00,000.

Lag in payment of wages ½ month

Lag in payment of other expenses ½ month

Selling price is Rs.8.00 per unit. Both production and sales are in regular cycle.

So in this case we will be taking about the problems here like say number 2 and problem number 3.

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- **PROBLEM 2:**

GE Electrical sells its products at gross profit of 20%. It includes depreciation as part of cost of production. The following information for 12 months ending 31st December, 2017 are given to enable you to ascertain the requirement of working capital of the company on a cash cost basis.

In your working you are required to assume that:

(i) A safety margin of 15% of net working capital will be maintained;

(ii) Cash is to be held to the extent of 50% of current liabilities;

(iii) There will be no work in progress and

(iv) Tax is to be ignored.

Stock of raw material and finished goods are kept at one month's requirements.

Sales at 2 months credit	Rs. 27,00,000
Material consumed (Suppliers credit is for 2 months)	Rs.6,75,000
Total wages (paid at the beginning of the next months)	Rs.5,40,000
Manufacturing expenses outstanding at the end of the year	Rs.60,000
(These expenses are paid 1 month in arrears)	
Total administrative expenses (paid as above)	Rs.1,80,000
Sales promotion expenses paid quarterly and in advance	Rs.90,000

So if you talk about the problem number 2, I think it is better for us to do the problem number 2 because it is going to create a different situation as compared to the problem number 1 we did so

we can find out that how to calculate the working capital requirement of a company where we have both the informations about the current assets also, current liabilities also and how to calculate the say net working capital.

So just go through this problem first of all before moving into or doing it practically. Let us move to the problem that what is the problem and how to do it. So if you see this problem here. General Electric sells its products at gross profit of 20%. It is a gross profit of 20% not the net profit. It includes depreciation as part of cost of production. The following information for 12 months ending on 31st December 2017 are given to enable you to ascertain the requirement of working capital of a company on cash cost basis.

Now it is a important question, cash cost basis. What is a cash cost? Because we have 2 kinds of the cost. One cost is the cash cost and another is a non-cash cost. Because you are studying here the working capital management so I assume that you already have the knowledge of financial accounting and in the financial accounting say for example when you prepare the profit and loss account there we include certain cost means which are cash cost.

For example raw material cost is a cash cost. Manufacturing expenses is the cash cost. Overheads, other overheads power, water, electricity all these are the cash cost. Because you are paying the cost in cash but there are certain cost like say you can say that is the depreciation. Depreciation is a cost. You are going to add up in the total cost of production in the profit and loss account maybe not in the trading account but that cost you are not going to pay to anybody.

Only it is a provision we are making in the profit and loss account and we are recovering the cost which we have already made in the form of the fixed assets. So not counting about the non-cash cost here we will have to only count about the cash cost and the cash cost is only the material cost, manufacturing cost, overheads cost. That cost we have to take into account. So on the basis of the cash cost we will have to prepare the working capital requirements of this company.

So it means the requirement is furthermore here that you will have to first calculate the cash cost and then means cash manufacturing cost and then the cash administrative cost. Means the cost of

goods sold and cost of sales. Both the cost we will have to work. That is on the cash basis we have to ignore the depreciation and further it is given in your working you are required to assume that a safety margin of 15% of the net working capital will be maintained.

A safety margin of the 15% of the net working capital will be maintained. Cash is to be held to the extent of 15% of current liabilities that is the 15% of the current liabilities, cash to be held to the extent of 50% of the current liabilities. So it means for that purpose you must be knowing the amount of the current liabilities first. The cash balance has to be added in the assets because cash is the asset it is not a liability but how much cash and bank balance we have to keep is it is given here that, that should be 50% of the current liabilities.

So you cannot calculate the total amount of current assets until and unless you have the value of the total current liabilities. So you will calculate the current assets without cash first and then you will calculate the current liabilities which will be available or the sources available and then you will take the 50% of those current liabilities, you will add up those say that 50% amount into the current assets so that way the total current assets the list will be complete.

From that total list you will subtract the current liabilities and then we will see that how much net working capital is required and here it is written as the first point a safety margin of 15% of the net working capital will be maintained. It means 15% net safety margin of 15% of net working capital. So net working capital which we will work out that is the current assets minus current liabilities 15% of that we will have to further work out.

And we will have to add up into that net working capital. So the net working capital will now be here that is the current assets minus current liabilities plus 15% of the net working capital that will be the total working capital requirements of this company on the cash cost basis. Further information is given to, given here that there is no work in progress text to be ignored and then stock of raw material and finished goods are kept at 1 month's requirement.

Sales information is given. Material is given. Total wages and manufacturing expenses. Then administrative expenses. Sales promotion expenses. Every information is given to us and from

this we can easily assess the working capital requirements of this company called as GE Electricals. So how to do this and how to assess the working capital requirements of this company that I will discuss with you in the next class. Thank you very much.