Work System Design
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Lecture - 35
Installation and Maintenance of Improved Methods

Namashkar friends. Welcome to session 35 that is the last session for week 7 in our course on work system design. So if you remember and you may be going through the various contents that we are discussing, the last 4 weeks we have focused our attention on method study. In the next 3 weeks, our attention will be on work measurement. So method study we have covered in the last 4 weeks in its various aspects.

If you remember in the previous session in the beginning of the session only I have emphasized few things. Just to briefly summarize the things that we have discussed in the previous session, we have seen that any method study problem has 4 important pillars, the first one is identification of the work that we need to analyze, the second one is recording that work using any of the graphical tools.

The third one is critical examination and development of the new method and the 4th one is installation and maintenance of the developed method or the improved method. So that is very, very important. So the 4th part that we are going to discuss today. The other important part is that how to record whatever work we are analyzing, whatever work we have identified.

We have identified a particular work for example bank official is issuing the drafts and cheques to the customers. We want to analyze the way the person is doing, how he is operating his computer, how he is accepting the cash receipts, how he is counting. So if we want to analyze that work first thing is the identification that okay this person is doing lot of manual work, let us focus our attention on this particular staff member.

Then, we need to understand that how to plot his activity, how to represent his activity into a technical term whether a particular type of graphical tool will be used, whether this is a problem fit for our operation process chart or this is a problem fit for a micro motion study

that we have to identify, so once we have identified the work the second one is identification of the technique that will represent the type of work being done by this bank official.

The third one is critical examination; we need to understand why the worker is following a particular sequence or particular pattern of activities or particular pattern of body motions or the micro motions. Questioning technique will help us to identify the areas in which we can improve the current method, also will give us different alternatives which can be further refined and developed into an improved method or a better method.

So the third stage basically is the critical examination and development. The second stage is the recording with the help of a proper graphical tool. The first stage is identification of the work that we want to analyze and the last stage is the installation and maintenance of the improved method.

So today our target is to understand that how to install, what can be the problem areas when we try to implement a new method, how to maintain the method, what factors we must keep in mind when we have to ensure that the worker is performing the task, the bank official is performing the task as per the standard operating procedure prescribed to him. So first thing is installation of the method which we have developed in session number 33 and session number 34, how to install it and finally we have to see how to maintain it.

So this is the purpose of our study today or our discussion today. So these are the steps involved. Already I have highlighted this.

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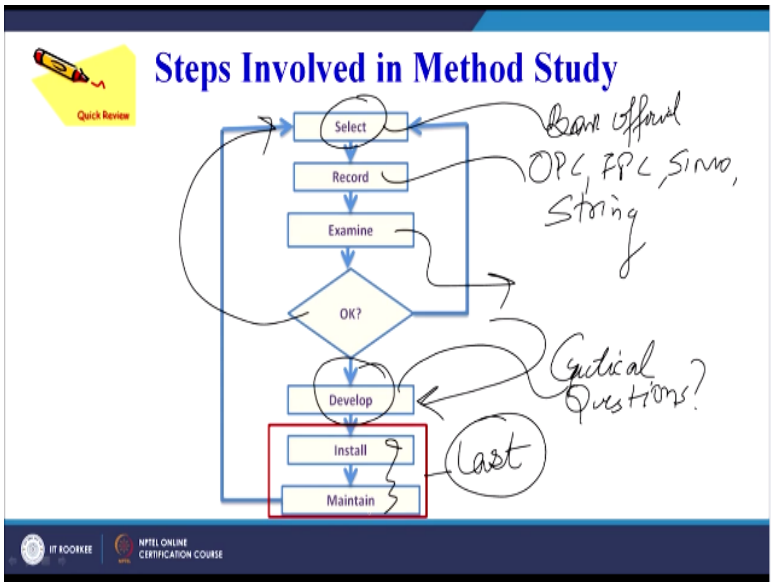

First we have to select, in yesterday's session or in the previous session I have taken an example, may be today again I have taken an example that we need to identify the area where we want to do the method study or where we want to put our energy and try to improve the current way of doing the work. So first one is selection, then the recording, today's example I have taken of a bank official.

So we have identified, then recording technique can be we can have an operation process chart, we can have a flow process chart, we can have a simo chart, we can have a string diagram. So we have to record it, once we have recorded it we have graphically represented the work that we have identified during the selection stage, the next is examination we need to examine.

It may so happen that already we are following the best method, the best practices for doing that work, it cannot be further improved. So we will say okay it is being done in the best possible manner, let us now select some other work for the analysis. So again we will carry forward the same steps and we will again reach the decision making box. Once the decision is taken that yes it further needs analysis then we will go to the next stage that is develop.

And in development what we will do, we will do the critical examination using the questioning technique, lot of questions will be asked which we have seen in session number 33, so from these questions we will be able to, what we will be able to? We will be able to generate the alternatives.

And then those alternatives we will be able to further scrutinize based on the technical feasibility, economic feasibility based on a number of parameter such as that which alternative will reduce the movement of men and material the most which alternative is most easy to implement which alternative is most inexpensive to implement. So based on number of criteria we will select the best alternative.

So all that will come under the development of the better method. Once we have developed the better method, the last stage is the installation and the maintenance and these are the 2 things that we are going to discuss today. So first one is identification, then recording the facts and figures in the form of graphical tools, then analyzing those tools, examining those tools, asking different types of questions during the critical examination process.

Then, generating alternatives then working on those alternatives to find out which alternative is best suited to the current situation and then comparing the alternatives based on number of criteria. Finally developing a better method of doing the job and once the better method is developed then we focus on installation and maintenance of the best method. Now steps involved in method study.

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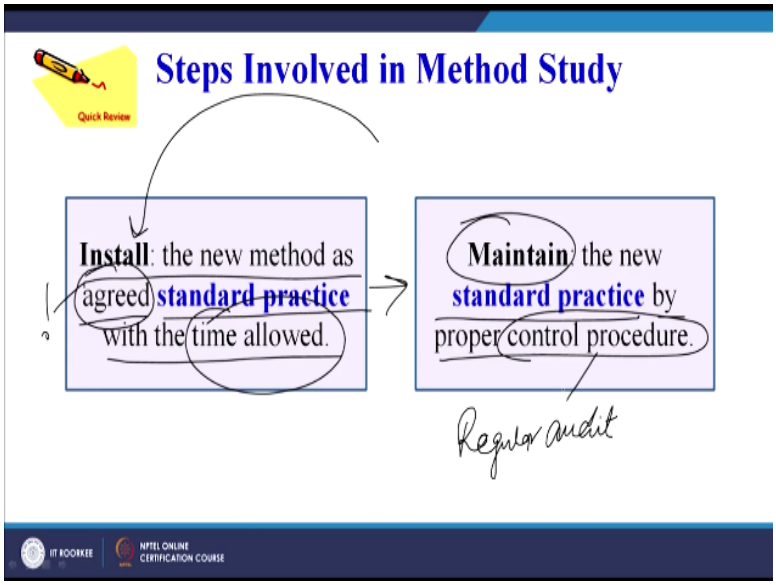

So these are the last 2 as I have already highlighted. The first one is install, once you have installed then you go to maintain, so in installation the simple explanation can be install the new method as agreed standard practice with the time allowed. Now the time allowed part we have to calculate and for that we carry forward our discussion may be in the next week on

work measurement where we will try to find out what is the standard time and how to calculate the standard time for different operations or activities or tasks at hand.

So at installation stage what we need to do, we have developed a new method using the approach that has been explained in the previous slide. Now we want to install that method, we want to implement that standard operating procedure on the shop floor or in the factory. So install the new method as agreed standard practice, the word agreed also is very, very important from the human issues point of view that we will discuss later.

So agreed standard practice with the time allowed, so once we have installed this method, we have implemented this new method then we have to maintain it. Maintain the new standard practice by a proper control procedure and one of the control procedure can be the regular audit. So we can do the regular audit and try to figure out that whether the workers are performing the task as per the standard practice advised to them, as per the standard practice given to them, as per the standard practice according to which they have been trained.

So these are the 2 important points which are very, very important. Why they are important? Because we have done all the spade work, we have tried to analyze the work, we have represented the work using a specific recoding technique, we have used our creativity, our common sense, our knowledge, the information available with us to develop a better method. We have scrutinized different alternatives to come up with the one best method.

Now if that one best method is not practiced, the whole can beat off operations or activities that we have done to develop this better method goes down the drain. So that we do not want, so if we want our efforts to bear fruit we have to ensure that the better method that we have developed putting all our efforts must be implemented, must be maintained for the specific period of time for which there are no changes.

Because the industry is changing at a very rapid pace, so the current method that we have developed may only be relevant maybe for the next year or so or may be for the next 2 years. If the technology changes, we have to again adapt ourself to the technological changes and the method that we have developed may become absolute after a specified period of time. So therefore for that period of time we have to ensure that it is maintained.

That all workers perform the task as per the standard practice which has been told to them. Now let us see the introduction, there are 2 stages now, first one is installation, second one is maintenance of the standard practice. So let us first talk about the installation.

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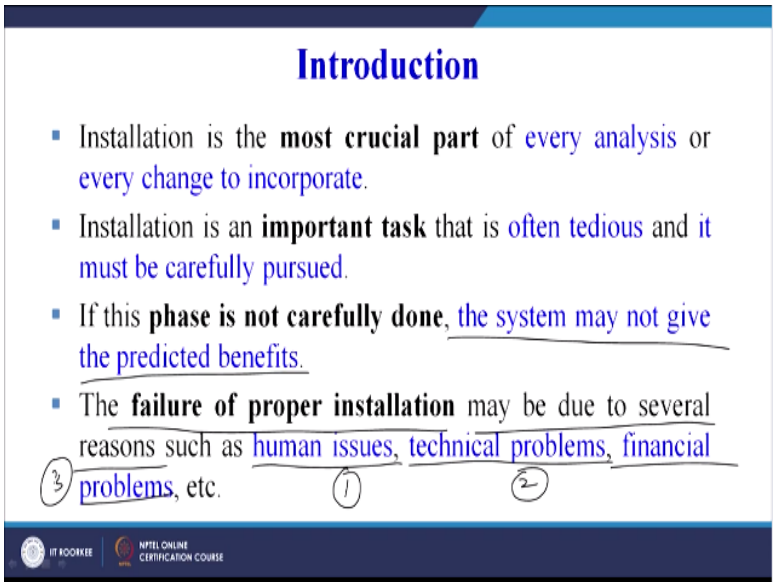

Installation is the most crucial part of every analysis or every change to incorporate. Installation is an important task that is often tedious and it must be carefully pursued as I have already told because this is the final result of all our efforts of analyzing the work, recording the work, creating a new method, developing a new method. So this is the final result which we have got, so it must be carefully installed or carefully implemented.

If this phase is not carefully done, the system may not give the predicted benefits. So we have predicted that if we change the layout 54% of the movement of the men and material will be reduced. We have already calculated that, it can only be realized if we are able to implement the new method that we have suggested. If we say that the layout has to be changed, if the industry or the management is ready to change the layout then only the predicted results will be realized, so the installation phase is very, very important.

The system may not give the predicted results if we are not careful enough to implement our new method. The failure of proper installation may be due to several reasons. Now many times we have done all the work, we have now the solution ready with us which is better as compared to the previous solutions that we are following but we are not able to install the new method why?

First one is the human issue, second is the technical problems, third are the financial problems. We are suggesting a change in the layout as per our study or the work study analysis that we have done or the method study procedure that we have adopted. It suggests that we have followed the string diagram approach and as per the string diagram the layout of the factory must change.

Now for changing the layout it requires money in terms of labour, in terms of equipment that would be required to shift the machines from one place to another. In many places, it may require civil infrastructural work also which will add further cost to this change. So the change may involve the financial issues also. It may involve the technical issues also but most important are the human issues who are more or less reluctant to change.

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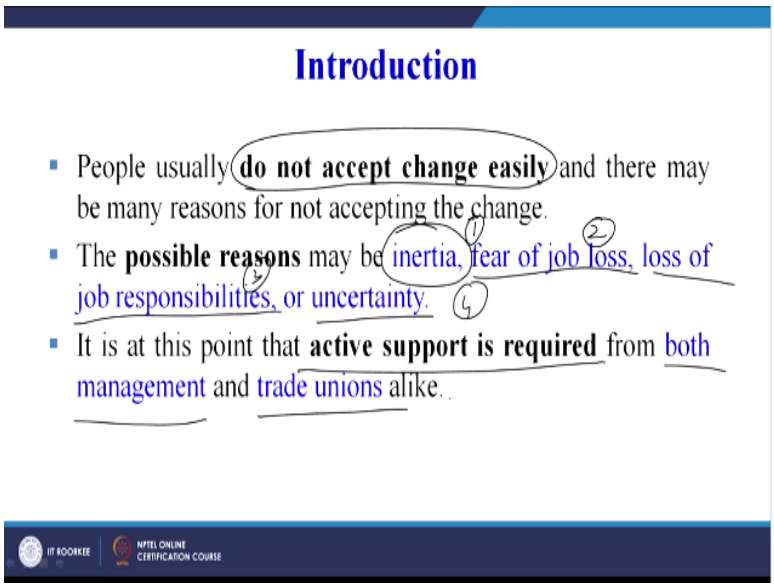

People usually do not accept the change easily and there may be many reasons for not accepting the change because all of us become habitual of doing the work in a particular manner only. If we are advised if we are told that now the things are going to change, there is an inertia which usually creeps in and we are reluctant to change. So people usually do not accept change easily and this is one of the biggest challenge for installing a new method for doing the work.

And there may be many reasons, now what can be the reasons, one of the possible reasons I have already told it can be the inertia, second one can be fear of the job loss, third can be loss of job responsibilities, 4th can be uncertainty. So there can be n number of reasons that people will resist the change but we have to be persistent enough to ensure that whatever

efforts we have put in, whatever technical commitment we have shown towards development of a better method it bears the fruit.

And all these issues are addressed with the workers, the supervisors, the managers, the trade unions, everybody is taken on board and it is kind of made a common program that if we are able to implement the changes it is going to benefit one and all, it is going to be a win-win situation for the company as well as for the workers.

And if that can be emphasized upon, if it can be explained in no uncertain terms to the workers, definitely they would love to change and adapt a better method which is more safe which is less tiresome which will cause less fatigue to them as well. So these are you can say catch words which we need to impress upon the workers so that they are ready to change and adapt to the new standard procedure of doing the work.

So it is at this point that active support is required both from the management as well as the trade union. So we have to take everybody on board and we have to create an environment of win-win situation so that all stake holders involved are happy with the change. Now what are the objectives?

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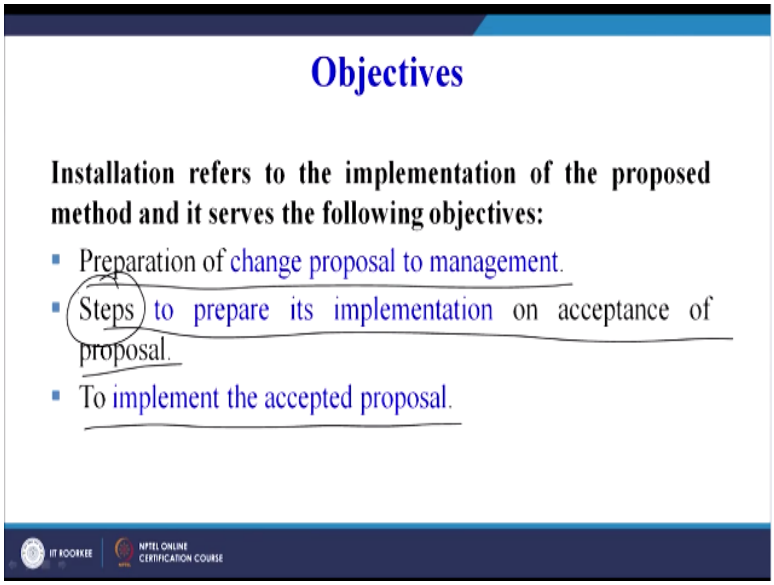

The installation refers to the implementation of the proposed method and it serves the following objectives. Preparation of change proposal to management, steps to prepare its implementation on acceptance of proposal to implement the accepted proposal. So what can

be that installation stage what can be done to make is successful, a change proposal can be made which can be put up to the management.

Then, another thing is it cannot be done in an abrupt manner, it cannot be done in a very, very haphazard manner. There has to be steps to prepare its implementation on the acceptance. Once the management approves the change it must be a step-by-step procedure for its implementation and once we have developed those step-by-step procedure final stage is the implement the accepted proposal.

Basic stages, as we have told that there are number of issues involved when you want to bring a change.

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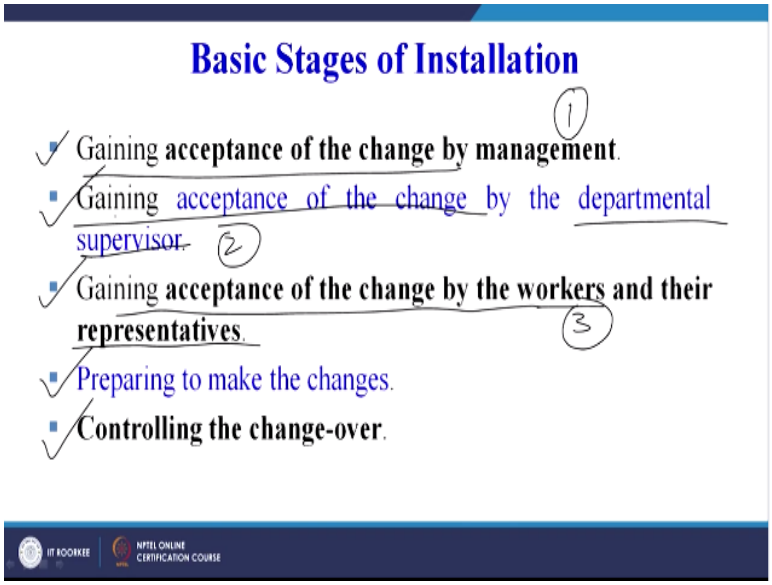

So how we can bring the change in a gradual manner, we can see gaining acceptance of the change by management, gaining acceptance of the change by the departmental supervisor, gaining acceptance of the change by the workers and their representatives, then preparing to make the changes and controlling the changeover.

So as I have already told that if we take all stake holders on board we bring in to account all the stake holders, in terms of the management in terms of the supervisory staff, in terms of the workers, their representatives, the trade unions and we try to impress upon them that this is going to be beneficial for them as well as overall productivity is going to increase and if the overall productivity leads to profits, the profits will be shared with the workers.

So if we create a situation of win-win, automatically all the stake holders will come on board and the change can be implemented in the most smooth manner. So this is once again the stages which can be followed for smooth implementation of the change.

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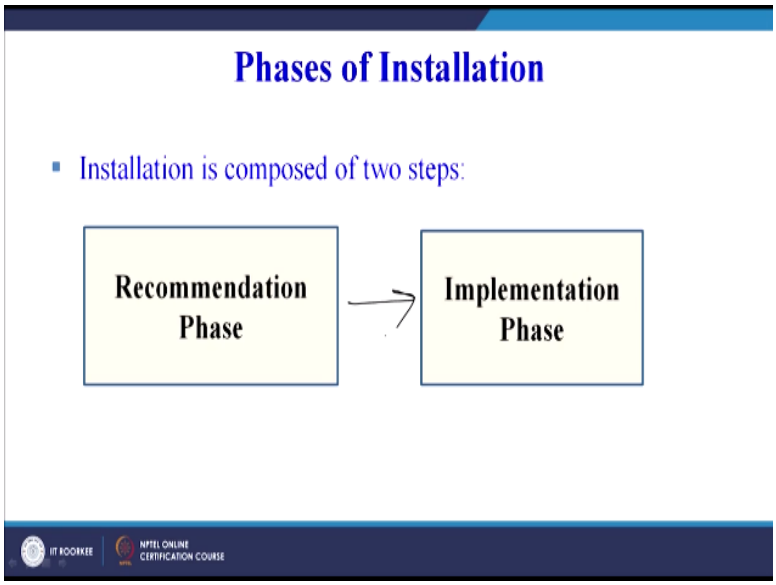

Now phases of installation can be recommendation phase and implementation phase. So this we have already seen that we have to prepare a change proposal that this is the current method of doing the work, this is the proposed method of doing the work, as per the proposed method this much number of operations can be reduced, the inspection instead of being done regularly can be done once only still ensuring that we are able to produce the quality items.

So the number of inspection is reduced, the unnecessary movement of men and material is reduced, the distance covered by the product from the entry into the work shop of the factory to the out as a final product or to the exit as a final product is reduced. So if we are able to make a change proposal that this is the current method these are the benefits that can be accrued if we follow the new method that type of change proposal has to be prepared.

So that change proposal has to be put to the management, so then our change can be implemented one is the recommendation phase where we will put this change proposal and once this change proposal is accepted we will go to the implementation phase.

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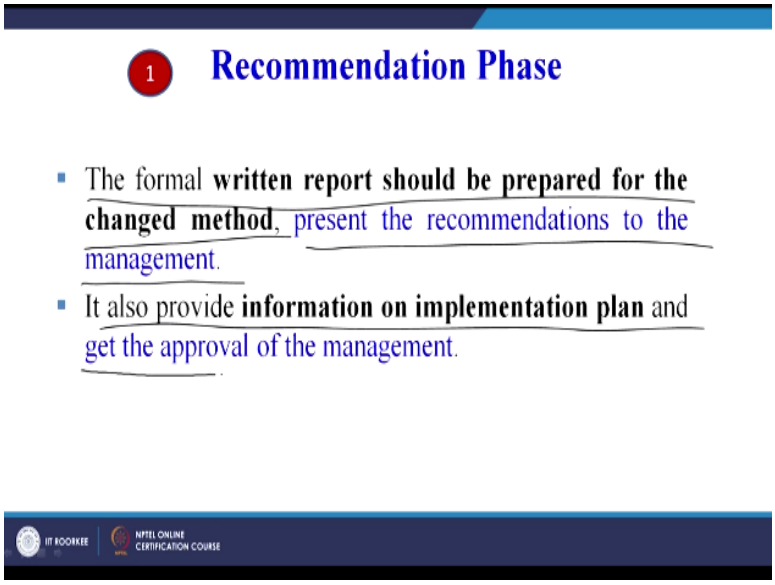

So in the recommendation phase already I have explained but again we can read. The formal written report should be prepared for the change method which already I have explained. Present the recommendations to the management. It also provides information on implementation plan and get the approval of the management. So the implementation cannot be abrupt, it cannot be in a haphazard manner, it has to be in a proper sequence of steps, it has to be well-planned implementation.

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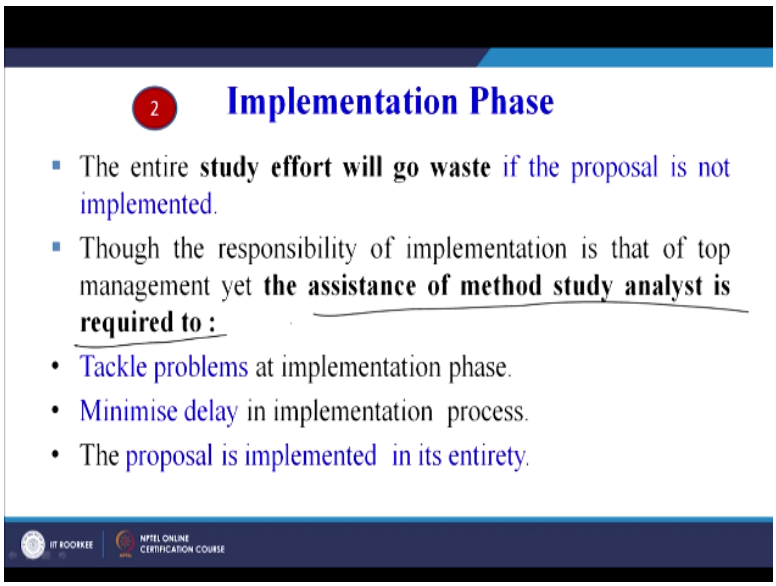

Then, the implementation phase the entire study effort will go waste if the proposal is not implemented. Though the responsibility of implementation is that of the top management yet the assistance of the method study analyst is required. So it is not that the method study analyst has completed his task or her task, the team has come up with the change proposal

that this is the current method of doing the work, we have developed a better method the better method is better in this uncertain terms.

This is better in terms of movement of men and material, it is better in terms of safety, it is better in terms of cost, it is better in terms of fatigue that the current method was causing to the worker. So may be based on number of criteria the work study team has recommended a better method of doing the job. The job does not end there; the work study analyst team must tackle the problems at the implementation phase.

Because they are the people, they are the professionals who have developed the better method. They are better judge to explain the benefits of this method to the workers, to the supervisors, to the managers. So they can minimize the delay in implementation process, they have to ensure that, another proposal is implemented in its entirety. So if we focus on bits and pieces, the proposal is not implemented in entirety, we may not be able to realize the full benefits of our better method or improved method of doing the job.

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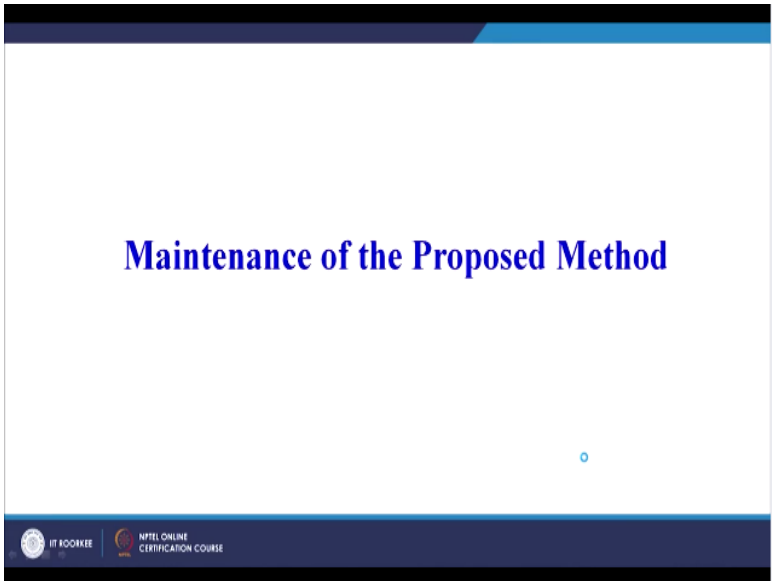

Now once we have seen that there are problems when we have to implement or install our new method but once we are able to successfully bring about that change we are able to train our workers to perform the task as per the new or the improved method. Once the work is now being done by all the workers as per the proposed method, we have to ensure that they do not fall back to their old habits of doing the work as per the non-traditional or non-standard method of doing the work.

So we have to ensure, we have to do regular audit and check that the work is being done as per the prescribed norms, as per the prescribed standards, as per the prescribed protocols. So how to maintain the proposed method?

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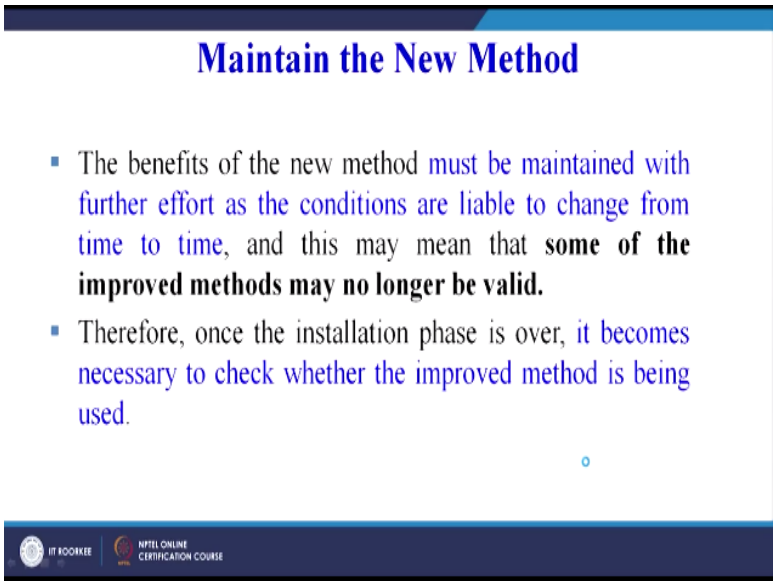

The benefits of the new method must be maintained with further effort as the conditions are liable to change from time to time and this may be that some of the improved methods may no longer be valid so for the time period for which there is no better method of doing the job, we must ensure that the workers perform the task as per the standard procedure as told to them or as put to them in the training stage.

Therefore, once the installation phase is over, it becomes a necessary to check whether the improved method is being used by the workers or they are still working with their old method or doing the work as per their traditional technique.

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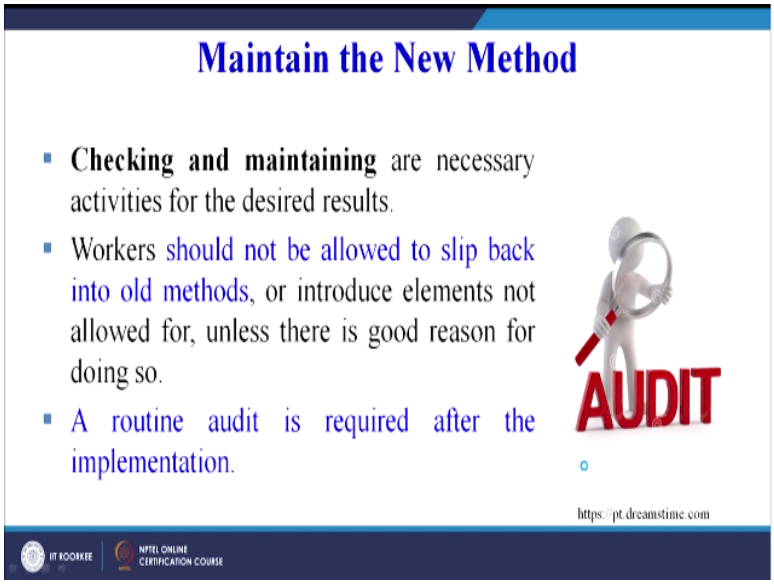

Checking and maintaining are necessary activities for the desired results. Workers must not be allowed to slip back into old methods or introduce elements not allowed for. Sometimes whatever best method we have found out, the workers may further like to tweak that method as per their convenience so that has to be avoided unless there is a good reason for doing so.

So if the workers can come up with solutions which can logically define the way they are doing the work then certainly the method suggested by workers can be a better method than suggested to them as a standard procedure. So the standard procedure also has scope of improvement because the person who is actually doing the work may further improve the method but that improvement must be scientific, it must be logical and must not affect the quality of his or her work.

A routine audit is required after the implementation. So we must ensure that the workers do not fall back to their old methods of doing the work and that can be ensured by regular audit and if they can suggest logically and scientifically even a better method or a significant improvement in the method suggested to them that is also a welcome change. Now this is one example that is installation of a standard practice.

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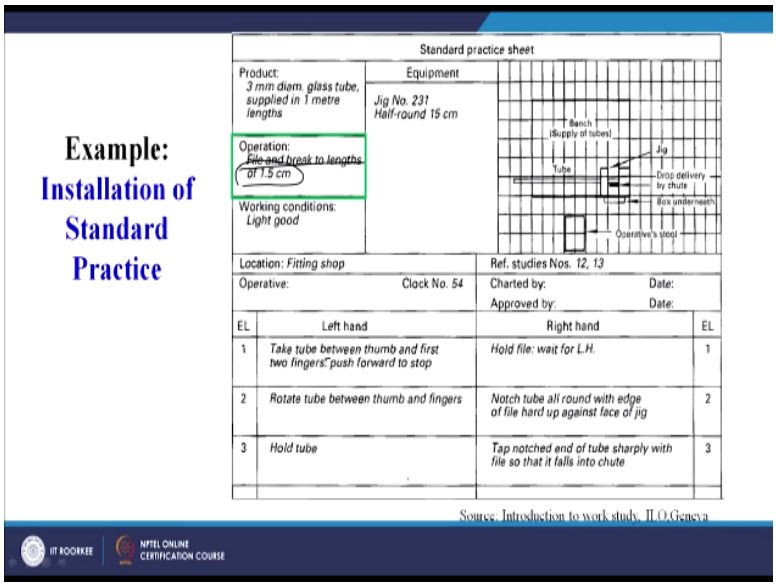

You can see already we have seen this case or this case study. A product is a 3 mm diameter glass tube supplied in 1-meter length and operation is file and break the lengths to 1.5 cm. So there was an improved method this is an improved method as compared to the old method this is showing. So this can be given to the workers as a standard operating procedure that what the left hand has to do.

The left hand has to take the tube between the thumb and the first 2 fingers, push forward to stop. The right hand has to hold the file and wait for the left hand. Left hand then has to rotate the tube between the thumb and the fingers and the right hand has to notch the tube all around with edge of the file hard up against the phase of the jig. Left hand has to hold the tube and the right hand has to tap the notched end of the tube sharply with file so that it falls into the box or the chute.

So this is a standard operating procedure which has been finalized which is more effective, more efficient, more productive than the current method of doing the work and for the current method you can refer back to our discussion in the method study, we have already explained this in one of the previous method where there was no stop and the job was being pulled through and then it was cut and it was taking lot of time.

So this case study has already been discussed in one of the previous sessions. So now this is the better method as compared to the current method. So workers are trained to do their work as per this method. So this standard practice has to necessarily be followed by the workers

and it is the job of the management to ensure that workers are practicing this with how they can ensure that, they can ensure it with the help of the regular audits.

So with this we conclude our discussion not only in the week 7 but also for method study. We have tried to address most of the recording techniques that are used for recording the work or the work that has to be analyzed. We have tried to see that how we can develop a better method choosing the critical examination technique that is focused on questioning and then we have seen that the questioning technique will get us to a number of alternatives among which our solution is lying.

So these alternatives when we will scrutinize, we will discard some of these alternatives. The remaining alternatives we will refine, we will develop them into one better method of doing the work and once that method has been identified, we will ensure that it is installed properly as well as once it is installed it is maintained with the help of regular audits. So with this we conclude the discussion on method study.

From next week, our discussion on work measurement or time study will start and now we will try to set the standard time for doing the work as per the standard procedure which we have defined till now. Thank you.