

Manufacturing Strategy
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Module No. #02
Lecture No. #06
World Class Manufacturing Organization

Welcome, friends. Now we are entering, into the second week of this course. And, in the first week, we discussed, what is the corporate level strategy, what is the business level strategy, and what is the functional level strategy. And, in the functional level strategy, we discussed that, all functional level strategies, need to come together, so that, you can see, the dominance of functional level strategies, at the corporate level strategies.

And obviously, our focus was mainly on, the Manufacturing Strategy. That, how Manufacturing Strategy can provide, important competitive advantage to the organisation. Moving further, in this session, we are going to quine, a new term, which is World Class Manufacturing organisations. World Class Manufacturing, and Manufacturing Strategy, are very closely related.

Therefore, in the beginning of this course itself, it is important to introduce this term, World Class Manufacturing. In earlier five sessions, we never used this term, World Class Manufacturing. We only concentrated on the term, Manufacturing Strategy. This is the first time, we are going to use, this World Class Manufacturing term. Now, the objective of manufacturing is Manufacturing Strategy is, to get the World Class Manufacturing status.

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World Class Manufacturing (WCM)

- This term was used for the first time by Hayes and Wheelwright in 1984.
- A set of practices, implying that the use of best practices would lead to superior performance. *Best in Class* *Scientific Mgmt. Taylor*
- WCM is a mindset based on a continuous improvement approach. *Concept*

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Now, this World Class Manufacturing term, was used for the first time, by two very important researchers, who contributed heavily in the field of Manufacturing Strategy. Their names are, Hayes and Wheelwright. In one of their paper, written in 1984, two very important papers, are available from Hayes and Wheelwright, one was published in 1979, and the second was published in 1984.

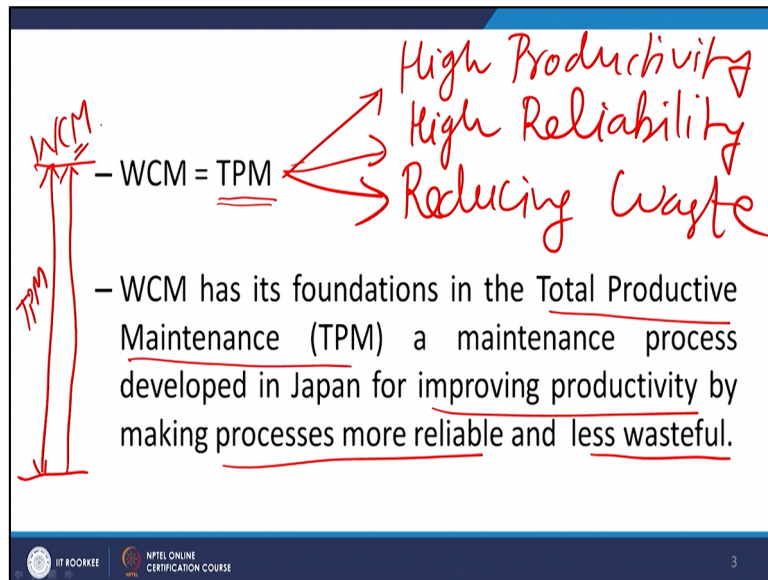
So, in this paper of 1984, Hayes and Wheelwright gave this term, World Class Manufacturing, which is also known as, WCM. So, again and again, we will call this, by the name of, World Class Manufacturing, or WCM. Now, this WCM, is a set of practices. It is a set of practices. And, which type of practices? The best practices. So, this is basically, the adoption of best practices, for your organisation, which will lead to superior performance.

So, world-class means, best in class. This is, best in class. Now, how you will be best in class, by adopting best practices. If you go deeper into it, you can also relate it, to the idea of scientific management, where Taylor, who is known as Father of Scientific Management. So, Taylor advocated, that there is one best way, of doing a particular activity. If you want to get best output, you need to do that activity, with that faster way.

Now, same idea is available for World Class Manufacturing, where we say that, if you want to have superior performance, or you put in another words, best in class performance, so you need to adopt, best practices. And, best practices will give you, best in class results. So, this is basically, a mind-set. WCM, is basically a concept. Now, the concept is based, on the idea of continuous improvement.

If I am doing continuous improvement, if I am doing regular improvement, so we will discuss in our coming slides, that the idea of Kaizen, which is continuous improvement, gradual improvement, these are the important elements, for achieving the World Class Manufacturing status.

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The World Class Manufacturing, WCM, can also be equated, to Total Productive Maintenance. So, TPM is a concept, which takes care of, variety of operational management issues. On one side, it takes care of your maintenance activities. On another side, it takes care of your quality. Another side, it takes care of your availability. So, multiple issues are put together, in a single philosophy. And, that is known as, Total Productive Maintenance.

Now, Total Productive Maintenance, and World Class Manufacturing, are almost similar. There are different ways to explain the concept. But, when you see, that if you are implementing, TPM in your organisation, you are actually going, to achieve the World Class Manufacturing organisation status. So, TPM is the foundation of World Class Manufacturing. And, we know that, in our operation management classes, we study, the objective of TPM, is to improve productivity.

Because, it talks of total productivity, by making process more reliable, and less wasteful. So, TPM has three important things, that you have to be, have high productivity, then you need to have high reliability, then you also need to have, or you also need to focus, on reducing

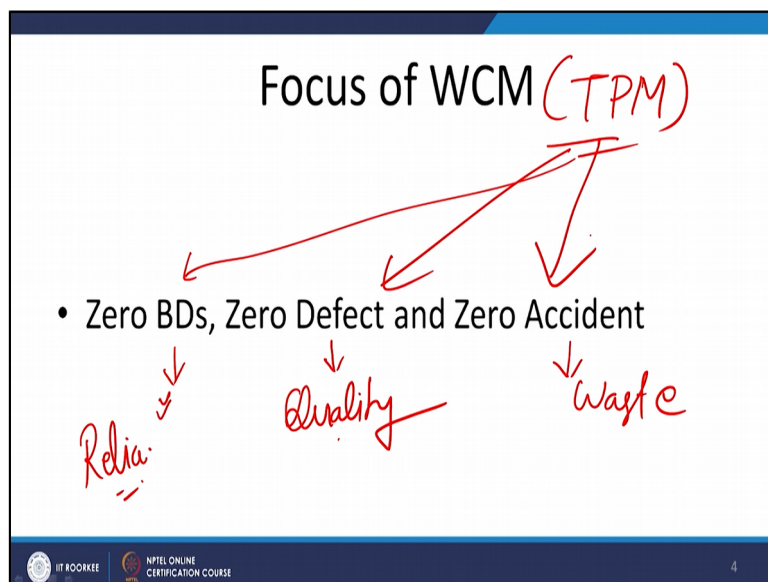
waste. So, these three things, are basically, three dimensions of TPM. And, that TPM, if you are able to achieve in your organisation.

Achieve means, you cannot go, that just, now today, I am a TPM organisation. There are, different degrees of TPM. So, if this is a spectrum of TPM, and you start your journey, from this point, you will slowly and slowly, reach up to the top. And, when you reach at the top, you become a World Class Manufacturing organisation. So, you may start TPM Level-1, TPM Level-2, and then finally, you may become a World Class Manufacturing organisation.

So, to achieve your World Class Manufacturing status, TPM is a very, very important handy tool. So, if you go into the detailed literature of TPM, which is available from, Japan Institute of Plant Maintenance. So, JIPM is the originator of this concept of TPM. So, if you go to the website of JIPM, you will find, lot of literature available in the area of TPM.

Otherwise also, there are dedicated books, available on Total Productive Maintenance. And, if we go in this course further, many of the issues, which are available in TPM, we will discuss under the name of, World Class Manufacturing. Now, the focus of World Class Manufacturing, as we discuss, the foundation of World Class Manufacturing, is TPM. So, the focus of World Class Manufacturing is, taken from the idea of, TPM only.

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Since, TPM stands for Total Productive Maintenance. So, the first point, is about zero breakdowns. When it is a maintenance activity, which is going to give you the world-class status, so your plants should have zero breakdowns. Zero breakdown plants, will help you in

achieving, the best possible delivery schedules. QCD is one very important, you can say, definition of operation executive, quality, cost, and delivery performance.

And, if you have zero breakdown, you will have, very high level of delivery performance. So, zero breakdown, is one very important aspect of World Class Manufacturing organisation. So, you will see, with the help of data in our coming sessions, that some of the world-class organisations, are having very low level of breakdowns. Then, zero defect. The zero defect represents, your quality. Your quality is of excellent level, that is zero defect.

So, another important element of World Class Manufacturing, the focus of World Class Manufacturing, on one side is, to have the very high availability of the plant. Then, second is quality, very high level of quality. And, third is, zero accidents. The accident is not only on the point of view of some personal, some labour, some technician, getting injured, but accidents are possible with variety of other issues.

Your que is there. And, waiting time is more. Your machine is not operating, at the optimum RPM. That is also, a type of accident. So, there are different types of accidents, which are possible, in the manufacturing shop. And, we need to minimise, we need to eliminate, all those accidents. So, reliability, quality, and waste, all these things, we need to go, for the highest level, you need to have highest reliability, or zero breakdown.

You need to have, highest level of quality, or zero level of defects. And, you need to have, no waste in your organisation, or you can say, zero accident. So, all accidents, actually create waste. So, you need to see, that how to minimise, this waste generation. How to eliminate, the waste generation, from your manufacturing setup. So, these are the three important focus area, for TPM, or for World Class Manufacturing.

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JIPM has started World Class Player award since 2015

- Innovation and Kaizen

Innovation

- Big jumps
- Big investments
- Top-down approach

Kaizen

Gradual, continuous improvement

WCM

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Now, as I said, that Japan Institute of Plant Maintenance, started this concept of World Class Manufacturing. And, to recognise the efforts of organisations, in the field of World Class Manufacturing, or to become the best-in-class players, they have started a World-Class Player Award, since 2015. So, this is the most, you can say, important recognition for an organisation, that you have achieved, the world-class excellence award, for your manufacturing efforts, or for your efforts in improving, your manufacturing capacities, in the organisation.

Many Indian organisations, are also doing tremendously well. And, we will see, with the help of one graph, that how our Indian organisations, are doing excellent in the field of these awards, instituted by Japan Institute of Plant Maintenance. Now, the key issues, we discussed in the previous slide, that the focus of World Class Manufacturing, is on zero breakdown, zero defect, and zero accident.

Now, for achieving these things, one of the fundamental strategy, which is being adopted by, almost all the World Class Manufacturing organisation, is the strategy of Innovation, and Kaizen. Innovation and Kaizen, these are two words, which are, you can say, similar. In one sense, they have some commonality. But, there are some differences also. So, world-class players, use both these concepts, of Innovation and Kaizen, to the advantage of their objectives.

Now, Innovations, we know, are the big jumps, big investments, top-down approach, all these are the characteristics of Innovation. Kaizen, we know, is the gradual continuous

improvement. So, some time, we go, you can say, in this fashion, that sometime, we go for the Innovation, where we move, from this position, to this position. And then, we go for Kaizen. So, where Kaizen is required, we do the gradual improvement, where we need to change our platform, from A to B. Then, at that time, we apply the concept of Innovation.

So, we use, Innovation and Kaizen in tandem, using both these concepts in a sequence, like this ladder I have shown. We move, from this position, to this position. So, if you only follow Kaizen, you move into the horizontal direction. You only follow the Innovation; you move in a vertical direction. So, we take, in the world-class organisations, a mix of Kaizen and Innovation.

And therefore, the world-class organisation, achieve this position, which is a better one, than the simple Kaizen, or simple Innovation. So, you do routine improvements, gradual improvements, continuous improvement, and at the same time, to cope-up with the needs of the market, with the needs of your other functional areas, you apply the concept of Innovation also.

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0	100%
Zero accident	Voice of customers is heard to the last level in the organization.
Zero breakdown	
Zero defects	
Zero scrap	
Continuous improvement through loss eradication	<u>People are the driving force of change</u>
No type of waste	Motivating environment
Methods for improvements are applied strictly	All faults are visible.

Handwritten notes on the slide:
 - A double-headed arrow labeled 'WCM' spans the top of the table.
 - 'Empowering customer' is written in red on the right side.
 - 'Highest top objectives' is written in red on the left side, pointing to the '0' column.
 - The '0' and '100%' headers are circled in red.

Then, the other important, you can say, characterisation of this World Class Manufacturing organisation, are possible, with the help of this table. In this table, you see, that there are two columns. One has the heading of zero. And, another has the heading of 100%. Now, there are few things, where we like to have zero, as our benchmark. And, there are few things for which, we want to have 100 as our benchmark. Or, to be more precise, 100% to be our benchmark.

Now, we want in a World Class Manufacturing organisation, zero accidents, zero breakdowns, zero defects, and zero scrap. So, all these things are, the zero. And, 100% is, voice of customers is heard, to the last level in the organisation. So, 100% voice of customers, is given due recognition, at the highest level of the organisation. So, you on one side, provide these zero's, and on the other side, you are giving empowerment to your customers.

So, these two things, go simultaneously. You are empowering customers. And, at the same time, you are providing, highest operational objectives. And, you know, how to handle these trade-offs. So, that is one very important aspect, of work class manufacturing. You take care zero's, and you take care of 100%. So, if you see this spectrum of World Class Manufacturing, so there are few things, which are sitting on this zero side, and there are some things, which are sitting on the 100% side.

But, many of the organisations, are somewhere here, somewhere here, somewhere here, where, neither they are able to achieve, zero breakdowns, zero defects, or zero scraps, etcetera, and nor, they are able to take care, of 100% voices of their customers. So, you are, in most of the cases will find, that organisations are not on those extremes. Organisations are sitting, at somewhere, central locations. So, there is a large amount of scope, of improvement, in the organisations.

Because, you have to simultaneously achieve your positions, at two points, in this spectrum. When I am talking of breakdowns, on this spectrum, you have to be on the extreme left. When you talk of empowered customers, you have to be on the extreme right. So, there are different types of variables. For some variables, you have to be on extreme left, and for some variables, you have to be on extreme right, if you are a World Class Manufacturing organisation.

So, these things, are there. You have to have, continuous improvement, through loss eradication. As, we are having, the empowered customers. So, similarly, there are external customers, there are internal customers. So, we need to have, this kind of environment in my organisation, where people are driving force of change. So, all the changes, are driven by the people. So, that is another beauty of World Class Manufacturing organisations.

So, you do not have, problems like, resistance to change. Because, everything is driven by the force of people. So, they are your impeller, for any kind of changes, which are happening in your organisation. So, we discussed that, no type of waste, motivating environment, all faults are visible, and everything, all these things are there, which we try to do, which we try to incorporate, in our world-class organisations.

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WCM aims to add value to business and customers by driving for a Zero Loss organization

..... Through the continuous development of :

- ✓ People ✓
- ✓ Process ✓
- ✓ Organization ✓

Min. Losses
↓
Mat.
Caput.
M/C
Pers.

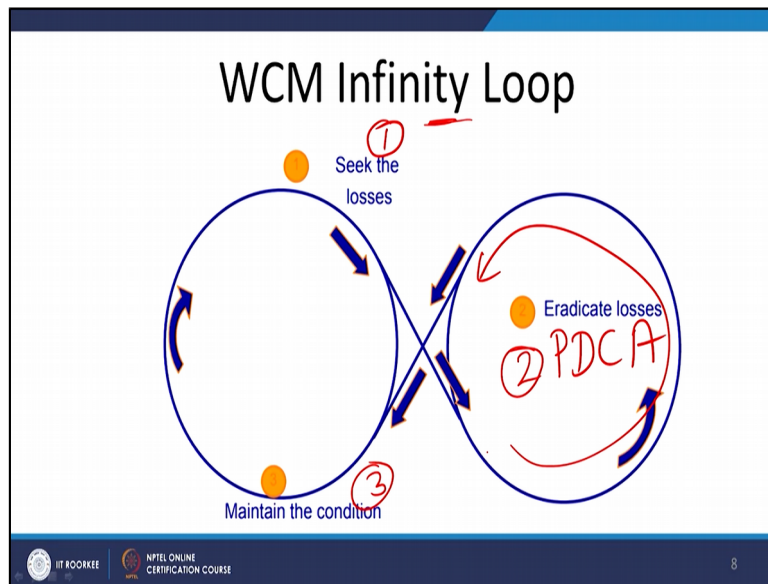
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Now, when we see, this World Class Manufacturing organisations, into detail, so what World Class Manufacturing organisations do? So, these WCM, aims to add, value to business. Obviously, value addition is a very important concept. And, they want to become, a zero loss organisation. So, if you see, that we have discussed, about 5 to 6 slides. And, in all the slides, I am continuously focusing, on one particular word, that is minimum losses. So, this loss may be of material, this loss may be of capital, this loss may be of machines, this loss maybe of personal.

So, it is not simply the losses, because of poor quality, this is losses because of some failures, there are different types of losses. So, you have to become, a total zero loss organisation. So, which include the, minimise the losses related to personals, minimise the losses related to material, minimise the losses related to technology, machines. So, all these, you have to minimise. And, for doing that, you need to have, very active involvement, of three important entities of your organisation. One is, people. The second is, process. And, the third is, organisation.

So, you need to see, that how people, process, organisation, can come together, to become the change agent, for becoming a zero-loss organisation. So, that is the idea of this discussion, of World Class Manufacturing focus. Now, the literature also suggests, a very interesting infinity loop, to define the World Class Manufacturing. Now, there are three important stages. And, you will see, with the help of this infinity loop, where you see, that you have two circles.

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This is stage number one, where I am observing, where I am identifying, some losses. So, I have identified the losses. And now, I am entering into the second circle. And, this is the eradication losses. So, I need to see the losses, I need to identify the loss. Yes, this loss is happening, at this particular stage. And then, I design, the entire eradication loss cycle. It can be a simply, PDCA cycle also. Plan, Do, Check, Act. So, it can be a simply PDCA cycle, where I am removing the losses, from my organisation.

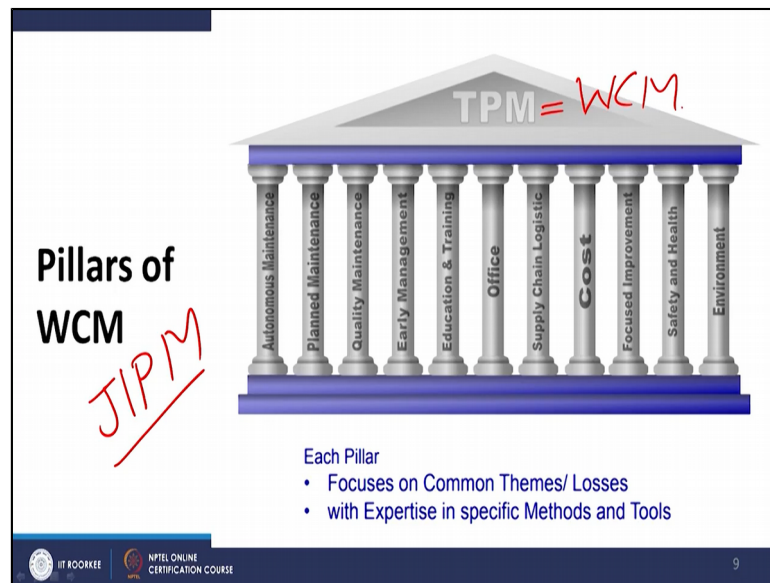
So, this whole referred you see, is in the direction of, eliminating those losses. And, once I eliminate the loss, I again enter in the first circle. And then, I want to maintain this condition. So, first, I am identifying the losses. Once I have identified the loss, then a new circle starts operating, that is the removal of those losses, may be using the concept of PDCA. And, once I have removed the losses, then again, I come back to my previous circle.

And, now I want to sustain, I want to maintain, that condition, that these losses, do not come again, into my organisation. And, then again, I will identify some new losses, and the process will go on. So therefore, this is known as infinity loop. That, this first cycle, and second

cycle, will continuously keep going. Every time, I will identify a new loss, a new problem area, and that will be communicated to the second cycle.

And, the second cycle will do something, to remove those losses. And then, once the losses are removed, again this problem will come to the first cycle. And now, the issue is to sustain that condition, to sustain that design, so that, these losses do not come again, into your manufacturing process. So, that is very interesting, WCM infinity loop.

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The literature means the, particularly the literature of JIPM, Japan Institute of Plant Maintenance. Since that, or to implement TPM, or World Class Manufacturing, you need to have, these 11 pillars, in your organisations. These 11 pillars, are the foundation block, of World Class Manufacturing organisation. So, these are like, autonomous maintenance, planned maintenance, quality maintenance. So, you see that, first three are related to, maintenance, maintenance, and maintenance.

Then, it focuses on, early adoption. Because, you are world-class, you are the flag bearer. So, you have to be always, in a leadership position. Toyota, started the concept of Toyota Production System. Toyota, started the concept of Lean Management. So, that is the early management. And then, rest of the organisations, started following, what Toyota did. So, many such things happen, with the World Class Manufacturing organisations, that they start, the early management of, some of these things.

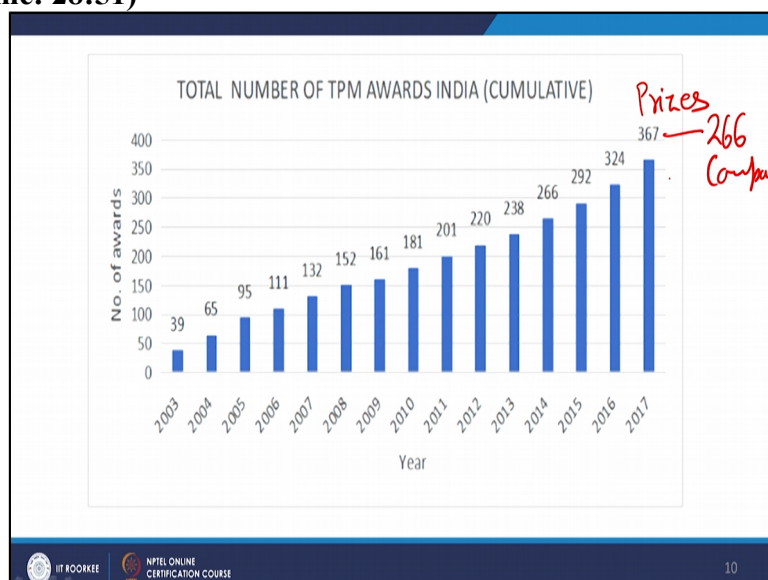
Education, and training. Because, you have to sustain the new systems. If I go back, to my discussions of infinity loop, so you need, training, education, that how to identify the losses, how to develop a PDCA cycle, how to sustain that condition. So, all these things are possible, when you are specifically trained, you are provided education, in that relevant area. Then, your office system. Because lot of things need, automation. Your office needs, a proper automated system.

And, office becomes a very important enabler, to achieve the status of World Class Manufacturing. The supply chain system. Whether, you want to have efficient supply chains, or you want to have a responsive supply chains. Then, the cost. How much cost is coming? Because, one of the objective, of this World Class Manufacturing is, to provide the best quality, at the minimum possible cost. So, cost is also becoming, a very important issue.

The focused improvement. So, you need to have, a very strategic idea of Kaizen, that how you are doing, the focused improvement in a particular area. So, you cannot be random, in the improvement activities. Rather, you have to be, very structured innovator in the organisation. Safety and health, are related to social sustainability. World-class organisations provide, excellent social sustainability, to its employees, to its neighbourhood. And, that is probably one of the reason of their being, the world-class organisations. And, the environment.

You also need to take care of this, physical environment, the natural environment. So, unless until, you take care of this environment, you will not be able to survive for long. So, that is also an important area. So, during our further discussions, we will be deliberating, on these pillars of World Class Manufacturing, separately, in their respective sessions. But, this gives you, a bird eye view, about the various foundations, various blocks, which make finally an organisation as, World Class Manufacturing organisation.

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Now, finally, when we are coming to almost end of the session, I want to give you the figures, that over the years, Indian organisations are doing pretty well, in this concept of World Class Manufacturing. Around, 266 companies, have bagged 367 prizes, in the field of Total Productive Maintenance. So, which is a part of, World Class Manufacturing only. Though, the world-class awards, are yet to come. But, there are different categories of TPM awards, Category-A, Category-B, then sustenance of those TPM awards.

So, there are different types of categories. So, in different categories, 266 Indian companies have won, 367 prizes. And, this data is accumulated, over the years. So, in 2003, you got only 39 awards. And, now in 2017, this tally has raised to 367. So, you can see that, every year, though number may change, from one year to another year. Like, in case of from 2008 to 2009, only 9 Indian companies, could get the TPM awards.

But, some other time, like from 2016 to 2017, around 43 organisations, got the TPM awards. So, different numbers are there, from one period to another period. But, this journey is continuing. And, I am hopeful that, in coming times, more TPM excellence awards, or the world-class player award, which started in year 2015, come to India also, from JIPM. So, with this, we close the session. Thank you, very much.