Introduction: Lean Manufacturing

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RIB Consulting
Retainment | Improvement | Breakthrough

Foundation for MSME Clusters (FMC)
(ISO 9001:2008 Certified Organisation)

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- Introduction
- Need for change
- What is Lean Manufacturing
- Benefits achieved through cluster program
- Govt. Scheme to support

We cannot become what we want to be by remaining what we are.


You may know that
elephants in India
are used as labor

But how to restrain them when they are not working?

Their handlers came up with the idea to "program" them while they are still very young by setting self-imposed limits into their thinking.

HOW DOES IT WORK?

When the elephants are still small, weighing around 100 KGS they get tied up with a very heavy rope. All day long, the elephants try to get rid of it, whine, tug at it and some of them even try to chew it. But they can't break free.

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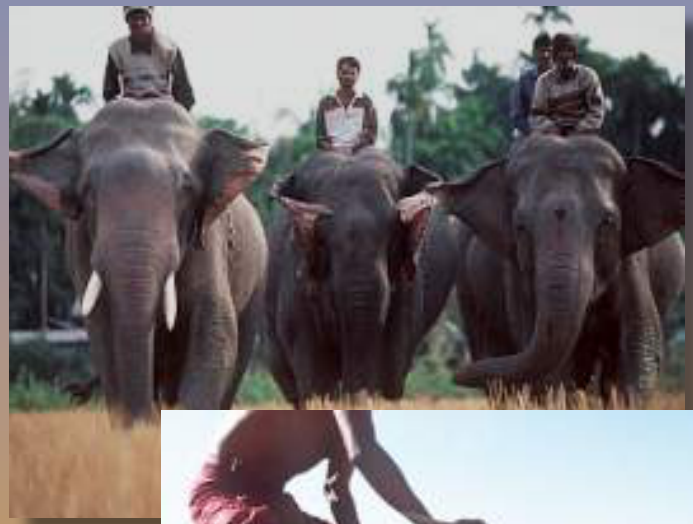
This story can make a difference of success and failure in your business and private life.

You may know that in India elephants are used for manual labor.

But what to do with them when they are not working? How to restrain them?



Finally the elephant gives up and the fight is over.

From this moment on, they strongly believe that there is absolutely no chance to get rid of the rope.

They accept the “fact” that the rope limits them. And with this imprinted belief in place, their handlers are able to tie them with extremely small ropes, even as adults weighing 5500 KG and more, they never attempt to break free, because they “know” they have no chance at all!


As you can see,
the elephants
limits are not real
but exist only in
their mind.

Doing things the same way generates the same result.

Real Progress is about *continuous* continuous improvement

Lean Manufacturing started in 1950..many industries still follow out dated Mass Manufacturing techniques

Industry's Concerns

Govt. Policies

Global Competition

Accountability to shareholders & financers

Rising Cost of Input (Raw material, Energy)

Competency of employees

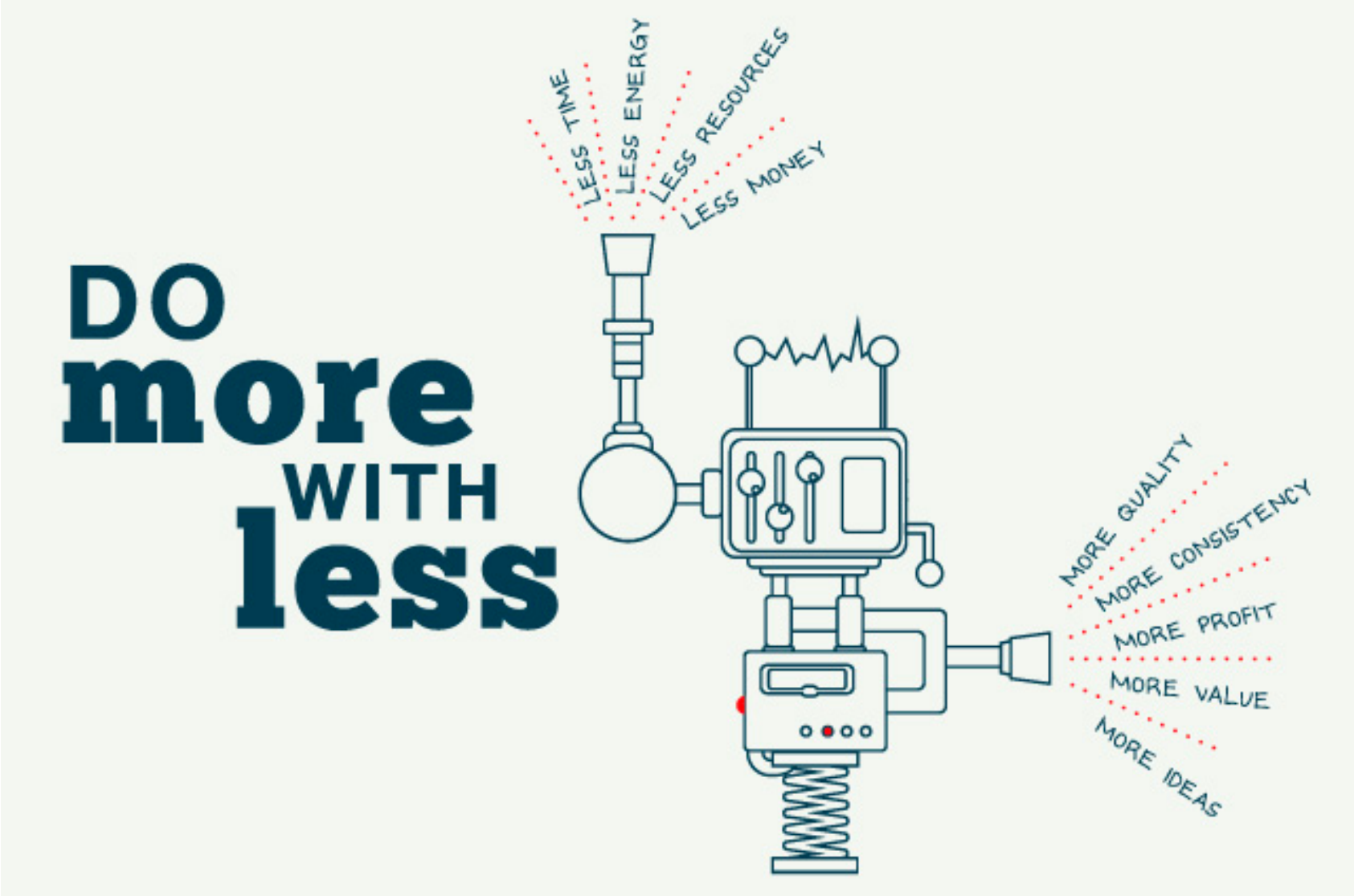
Above all SUSTAINABLE Improvement

Lean Manufacturing is the way to go

Lets understand few terms first

Lean Manufacturing is journey of an Organization from Fat to Fit

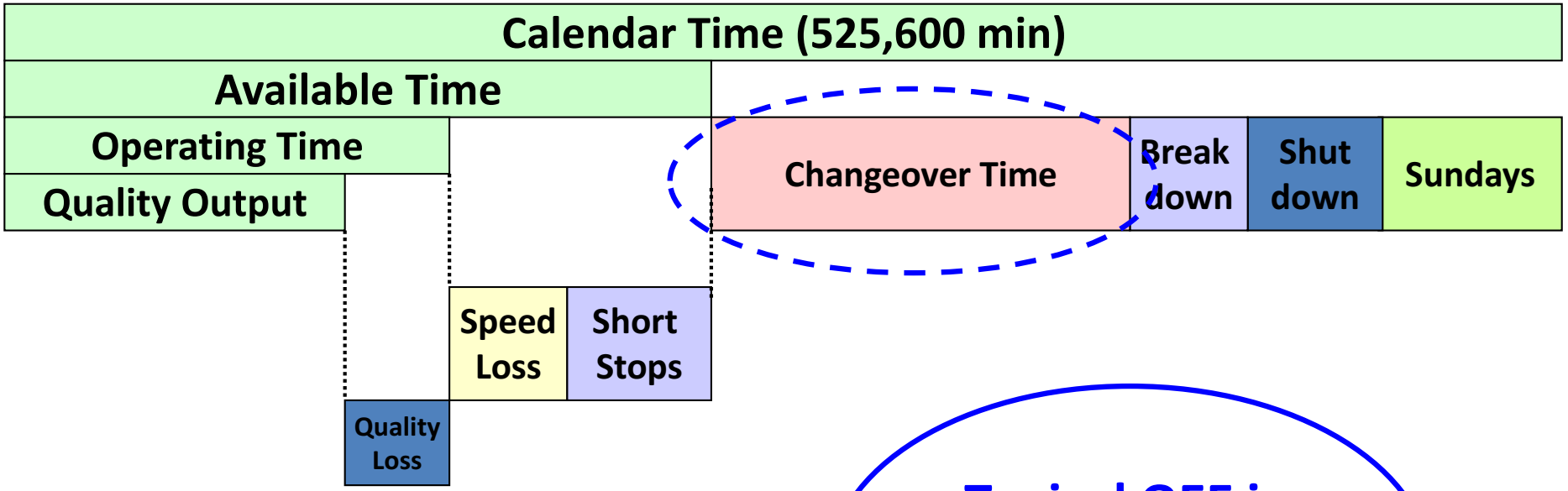
What is Lean Manufacturing?



What is Lean Manufacturing?

Optimum utilisation of all resources (Man, Machine, Material, Space) by identifying & eliminating wasteful activities

Loss Tree
(Finding Waste)



Typical OEE is
30~40%
A Hidden Factory

OEE: Overall Equipment Effectiveness

Examples of Wasteful activities

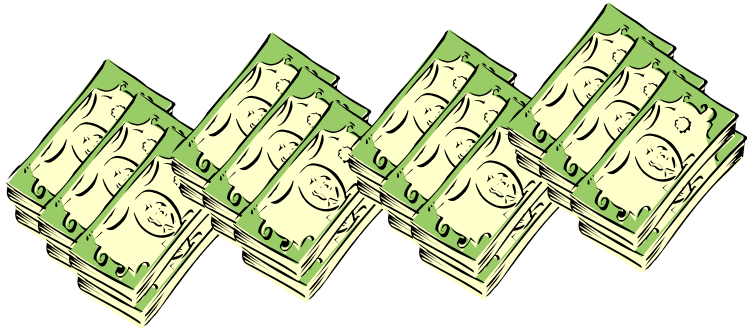
- Defective Products | Rejection
- Over processing (doing process more than required)
- Waiting (Machine waiting for manpower, Man waiting for machine, machine waiting for material, tools etc.)
- Non utilised Talent of people
- Transportation more than required
- Excess Inventory
- Motion – Extra movements of operators
- Mother of all Wastes: Producing more than Required

Waste: How to see it

- What should flow
  - Material in a factory
  - guest in a hotel
  - document in an office
- Is it stopping? Waste!
- Is it retracking? Waste!
- Is it piling up? Waste!
- Reprocessing? Waste!

Lean is

Extracting money by *eliminating waste* from processes



What is *NOT* Lean?

- Every improvement done is not LEAN
- Financial Investment to solve problems is not LEAN
- Solving a problem by using *opinions* is not LEAN
- Symptomatic relief to a problem is not LEAN

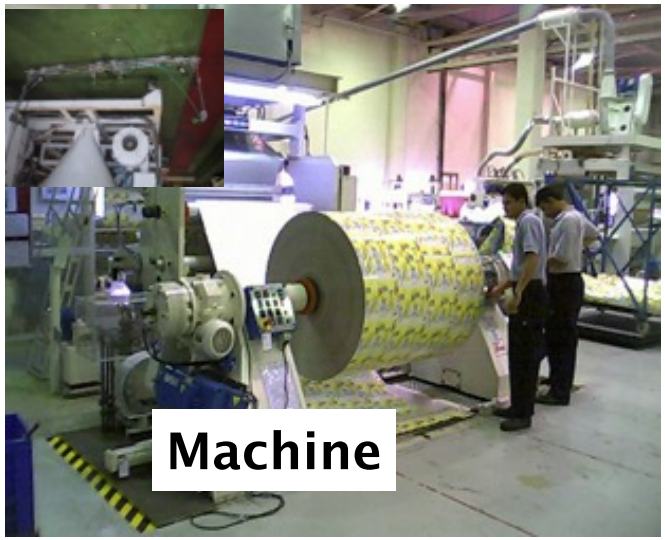
What LEAN is *NOT*

What people *think* is improvement, is often not so!

Producing more than you can sell is *not* improvement

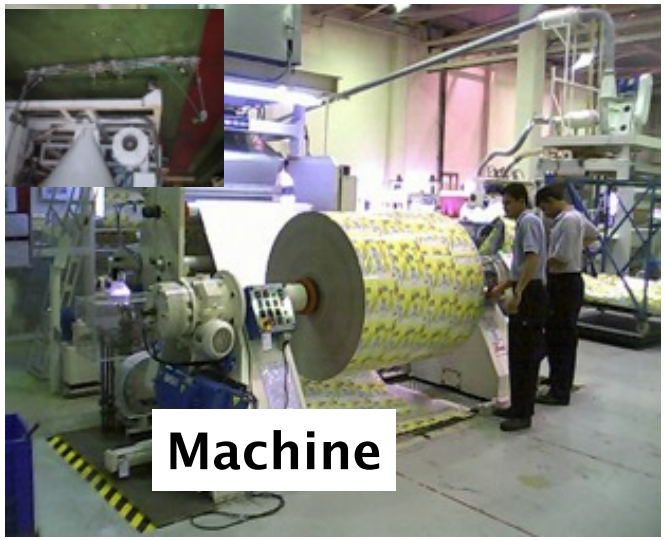
Increasing batch size to reduce changeovers is *not* improvement

LEAN Paradigm:
Utilization of which Resource is most important?



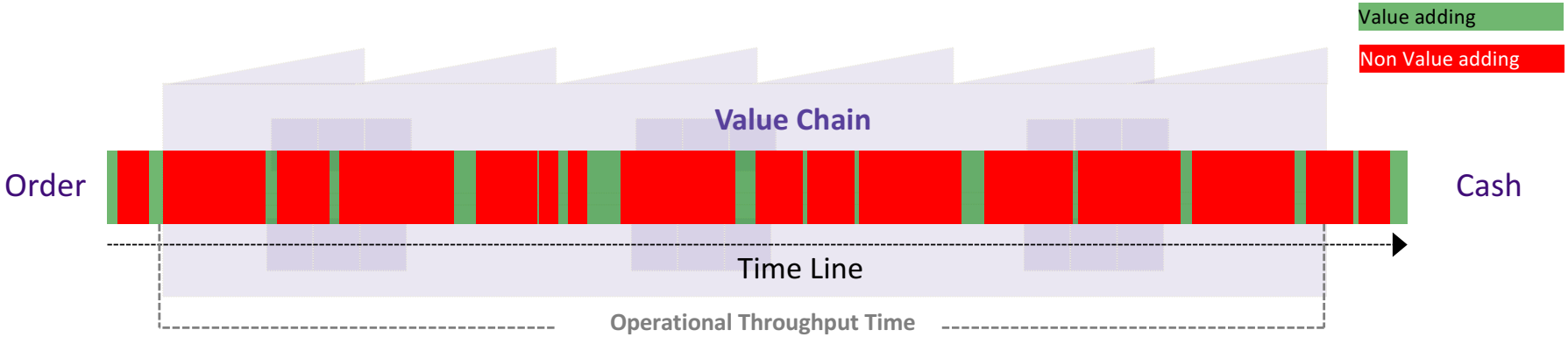
It is idle:
I am most
upset

LEAN Paradigm:
Utilization of which Resource is most important?



When material utilization is recognized as most important, Lean arrives

Objective of Lean Manufacturing



Eeduce time line from receipt of confirmed order to the time when the cash in collected by reduction / elimination of Non Value adding activities

Throughput time reduction

Results of Throughput time reduction

Reduced Costs

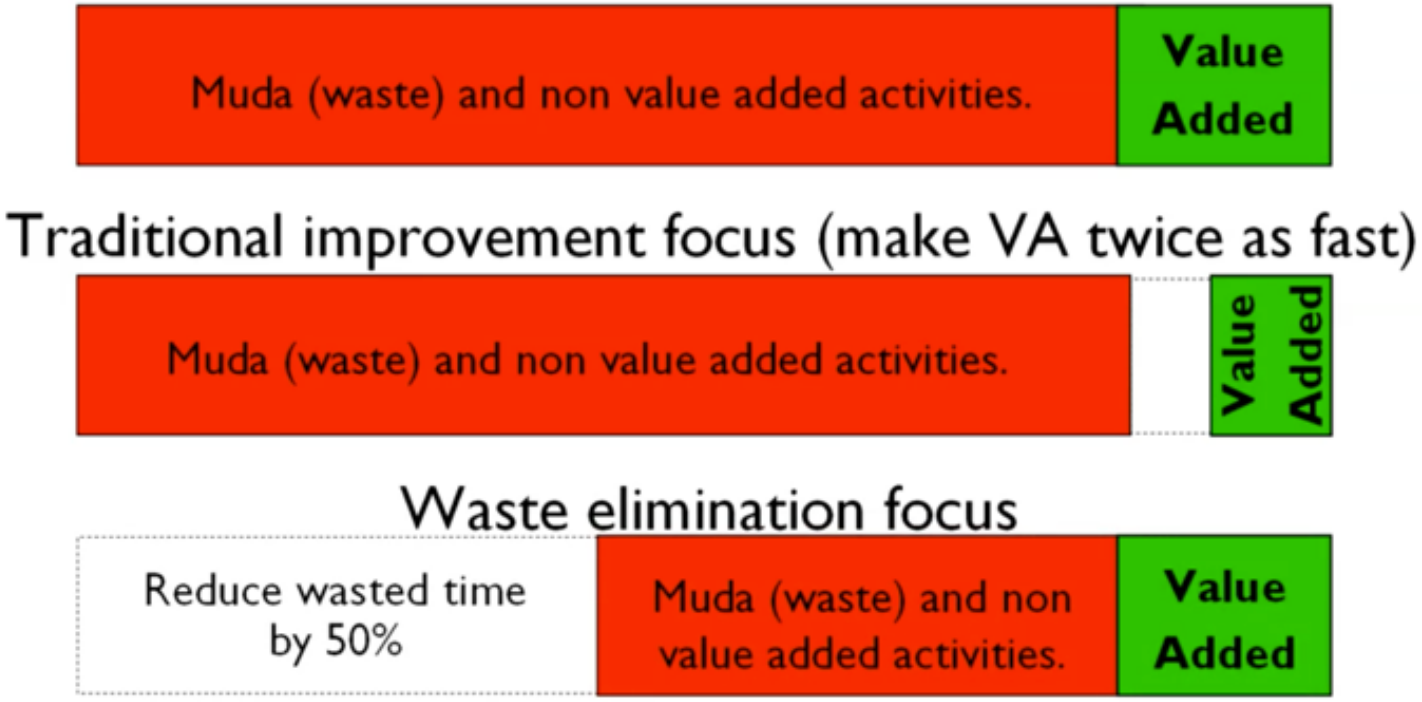
Better quality

Less Stocks

Improved Deliveries

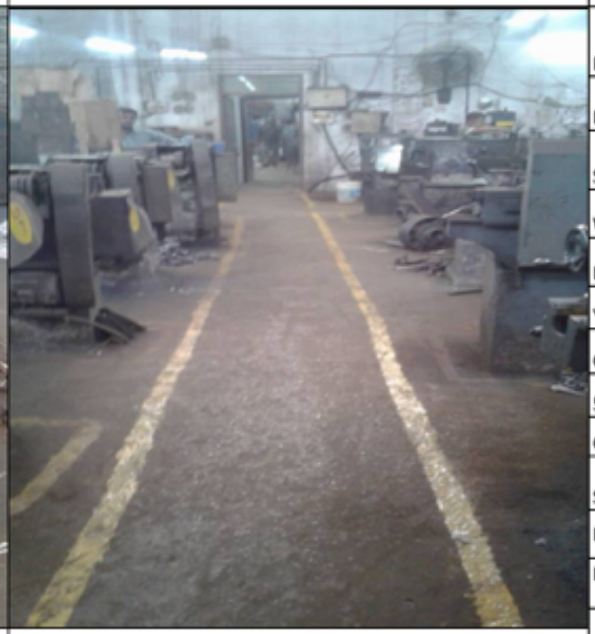
Better customer service

Focus on Waste elimination results in lot of savings!



Benefits achieved in Cluster Program

Shop floor arrangement

Subject-Material arrangement	Process- Machinning		
Before Improvement- (Photo)	After Improvement- (Photo)		
		Manpower, manpower hours Saving-	
		Physical Distribution-	
		Space Saving-	
		Weight reduction-	
		Energy Saving-	
		Yield-	
		Quality improvement-	
		5'S'	
		Cost reduction-	
		Safety-	
		Horizental Application-	
		Productivity Improved-	
		Cost Saving/Year-	
Earlier: Required and not required mixed and unidentified lying in between passage.	Now: Required material stacked with yellow demarkation.	Date Of Implementaion-	
Benefits- 1. Material searching time reduced. 2. Space saving 3. unidentified material removed at early stage		Suggested By-	
		Approved By-	

Material Storage improvement

Subject-Material stock	Process- Casting stock arrangement		
Before Improvement- (Photo)	After Improvement- (Photo)		
		Manpower, manpower hours Saving-	
		Physical Distribution-	
		Space Saving-	
		Weight reduction-	
		Energy Saving-	
		Yield-	
		Quality improvement-	
		5'S'	
		Cost reduction-	
		Safety-	
		Horizental Application-	
		Productivity Improved-	
		Cost Saving/Year-	
Earlier: Required and not required mixed and unidentified. No proper arrangement	Now: Required material stacked with identification	Date Of Implementaion-	
Benefits- 1. Material searching time reduced. 2. Space saving 3. Defected pieces identified at early stage		Suggested By-	
		Approved By-	

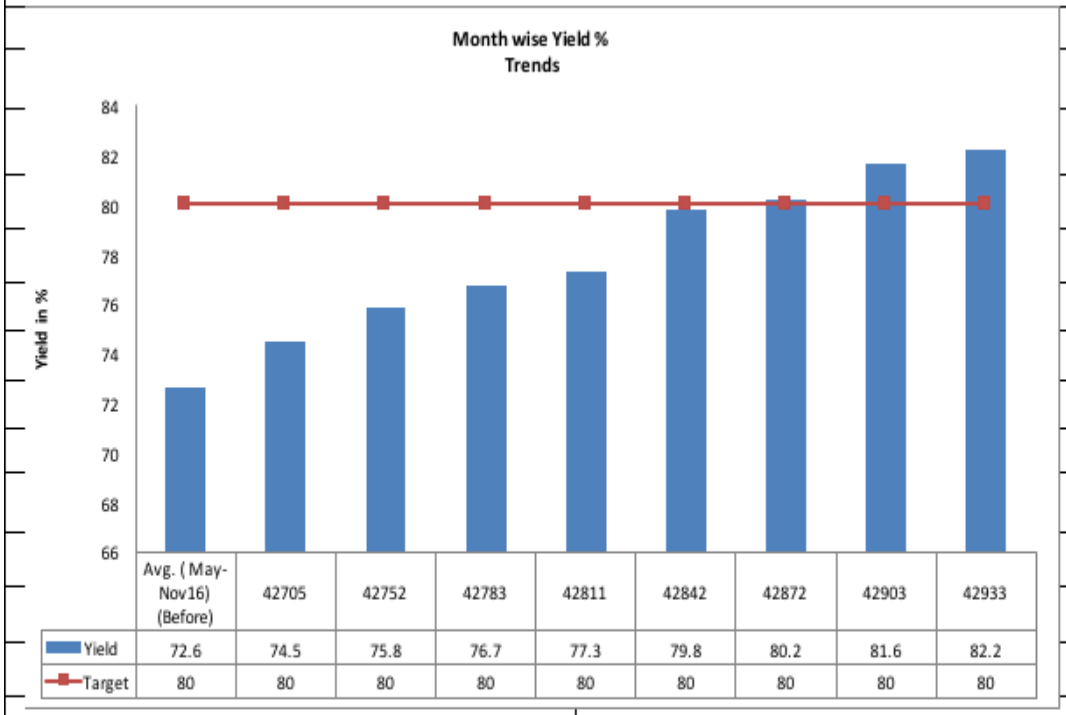
Parts store improvement

Subject-material identification issue	Process-		
Before Improvement- (Photo)	After Improvement- (Photo)		
		Manpower, manpower hours Saving-	
		Physical Distribution-	
		Space Saving-	
		Weight reduction-	
		Energy Saving-	
		Yield-	
		Quality improvement-	
		5'S'	
		Cost reduction-	
		Safety-	
		Horizental Application-	
		Productivity Improved-	
		Cost Saving/Year-	
Earlier: Required and not required mixed and unidentified	Now: Required material stacked	Date Of Implementaion-	
Benefits- 1. Material searching time reduced. 2. Space saving 3. unidentified material removed		Suggested By-	
		Approved By-	

FG Store Improvement

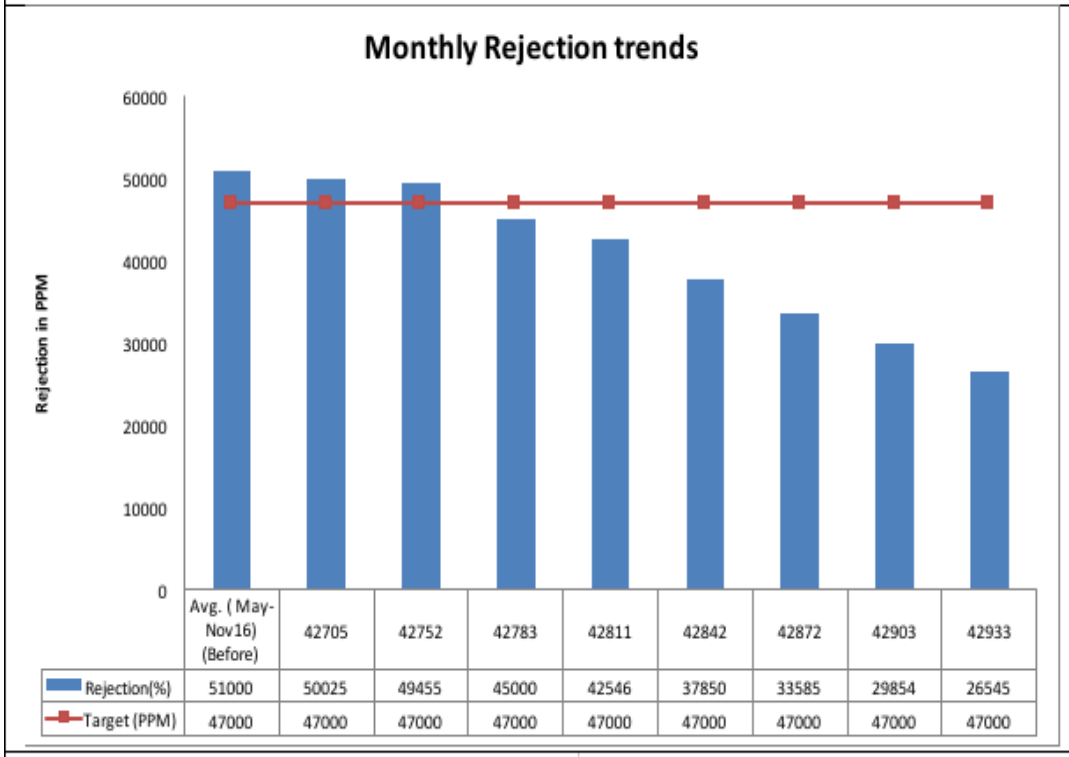
Subject-Visualization	Process-		
Before Improvement- (Photo or Explanation Drawing)	After Improvement- (Photo or Explanation Drawing)		
		Manpower, manpower hours Saving-	
		Physical Distribution-	
		Space Saving-	
		Weight reduction-	
		Energy Saving-	
		Yield-	
		Quality improvement-	
		5,s-	
		Cost reduction-	
		Safety-	
		Horizental Application-	
		Productivity Improved-	
		Cost Saving/Year-	
Earlier: Finished material lying in gang way	Now: Gangway marked and material shifted to designated place	Date Of Implementaion-	
Benefits- Improvments in 5S and Visualisation		Suggested By-	Rahul

Material Yield Ratio Improvement

Subject- To improve Yield ratio	Process- Casting		17-Jul
Improvement Trends			
		Manpower, manpower hours Saving-	
		Physical Distribution-	
		Space Saving-	
		Weight reduction-	
		Energy Saving-	
		Yield-	
		Quality improvement-	
		5'S'	
		Cost reduction-	
		Safety-	
		Horizental Application-	
		Productivity Improved-	
		Cost Saving/Year-	Rs. 884520
Earlier-Avg. yield was 72.6 %	Now- Yield is 82.2%	Date Of Implementaion-	
Benefits- 1. Improvement in Productity 2. Quality improvement 3. Yield Inprovement		Suggested By-	Dharamvir Uppal

	Avg. (May-Nov16) (Before)	42705	42752	42783	42811	42842	42872	42903	42933
Yield	72.6	74.5	75.8	76.7	77.3	79.8	80.2	81.6	82.2
Target	80	80	80	80	80	80	80	80	80

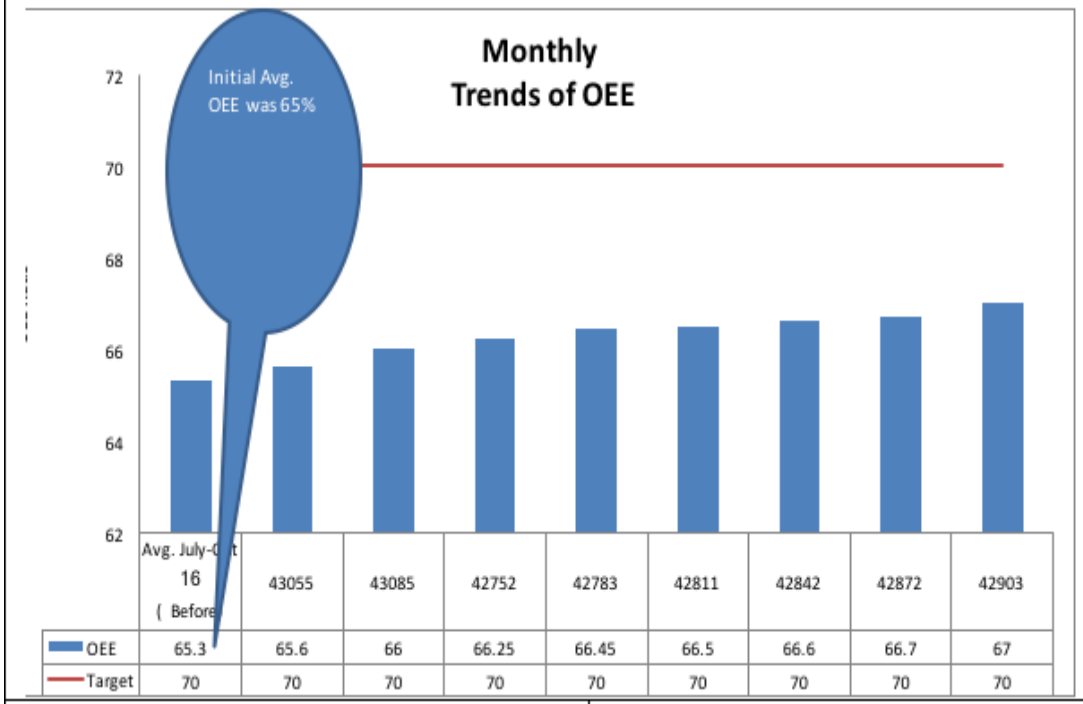
Rejection Reduction

Subject- To reduce rejection %	Process-Casting		17-Jul
Improvement Trends			
		Manpower, manpower hours Saving-	
		Physical Distribution-	
		Space Saving-	
		Weight reduction-	
		Energy Saving-	
		Yield-	
		Quality improvement-	
		5'S'	
		Cost reduction-	
		Safety-	
		Horizental Application-	
		Productivity Improved-	
		Cost Saving/Year-	Rs. 410670
		Date Of Implementaion-	
Earlier- Avg Rejection was 51000 PPM	Now- Rejection is 26545 PPM	Suggested By-	Dharamvir Uppal

	Avg. (May-Nov16) (Before)	42705	42752	42783	42811	42842	42872	42903	42933
Rejection(%)	51000	50025	49455	45000	42546	37850	33585	29854	26545
Target (PPM)	47000	47000	47000	47000	47000	47000	47000	47000	47000

Machine efficiency & Output improvement

Before/After Improvement- **(Graph)**



	Avg. July-Oct 16 (Before	43055	43085	42752	42783	42811	42842	42872	42903
OEE	65.3	65.6	66	66.25	66.45	66.5	66.6	66.7	67
Target	70	70	70	70	70	70	70	70	70

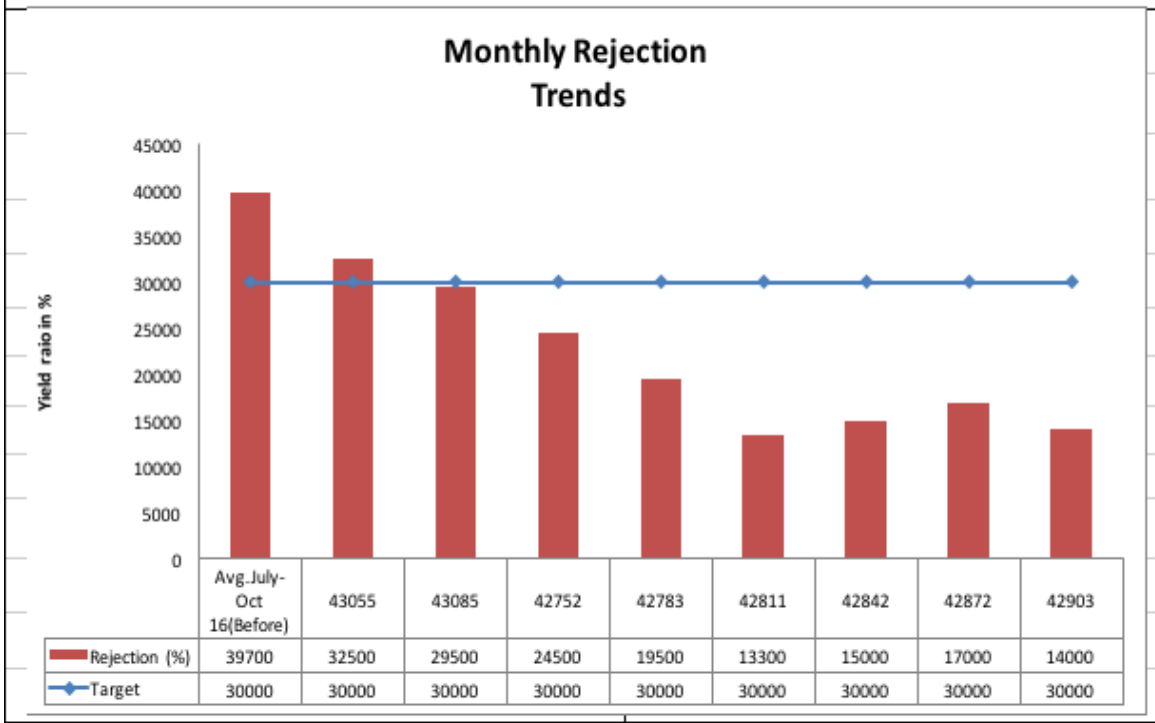
Earlier: Avg. OEE was 65%

Now: Avg. OEE is around 66.4%

Benefits-1. Productivity improvement. 2. Quality Improvement 3. Availability ratio improvement 4. Changeover time improvement

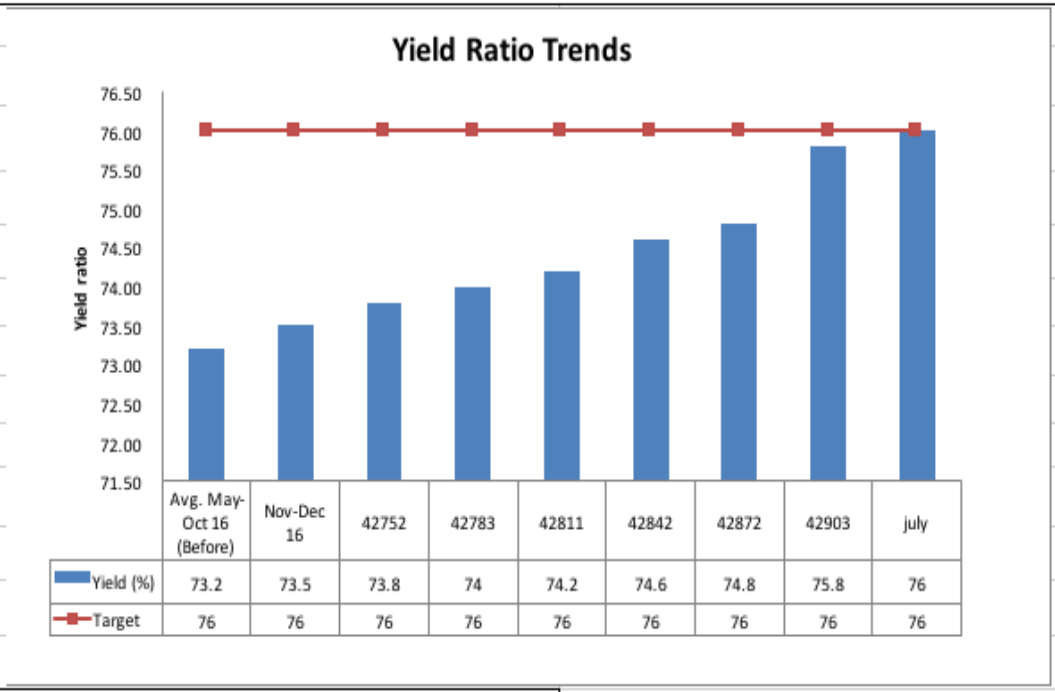
Manpower, manpower hours Saving-	
Physical Distribution-	
Space Saving-	
Weight reduction-	
Energy Saving-	
Yield-	
Quality improvement-	
5,s-	
Cost reduction-	
Safety-	
Horizental Application-	
Productivity Improved-	
Cost Saving/Year-	**Rs. 242580**
Date Of Implementaion-	
Suggested By-	Dharmvir Uppal

Rejection reduction in Foundry

Subject-Yield Improvement	Process- Casting		
Before/After Improvement-	(Graph)		
		Manpower, manpower hours Saving-	
		Physical Distribution-	
		Space Saving-	
		Weight reduction-	
		Energy Saving-	
		Yield-	
		Quality improvement-	
		5S	
		Cost reduction-	
		Safety-	
		Horizental Application-	
		Productivity Improved-	
		Cost Saving/Year-	Rs. 149850
Earlier:Avg. Rejection was 3.97%	Now: Avg. rejection is 1.65%	Date Of Implementaion-	
Benefits- 1. Imprivement in Quality 2. Cost reduction		Suggested By-	Dharmvir Uppal

	Avg.July-Oct 16(Before)	43055	43085	42752	42783	42811	42842	42872	42903
Rejection (%)	39700	32500	29500	24500	19500	13300	15000	17000	14000
Target	30000	30000	30000	30000	30000	30000	30000	30000	30000

Foundry Yield Ratio Improvement

Subject-To improve Yield Ratio	Process- Cupola Melting		
		Manpower, manpower hours Saving-	
		Physical Distribution-	
		Space Saving-	
		Weight reduction-	
		Energy Saving-	
		Yield-	
		Quality improvement-	
		5'S'	
		Cost reduction-	
		Safety-	
		Horizental Application-	
		Productivity Improved-	
		Cost Saving/Year (In Rs.)-	169,080
Earlier-The monthly Rejection was 6.43 %	Now-The Rejection is 4.51 %	Date Of Implementaion-	
Benefits- Improvments in Searching time. WIP detail prepared for reference. planning improved.	1. 2. Daily 3. Production 4. Space saving due to	Suggested By-	Dharamvir uppal

	Avg. May-Oct 16 (Before)	Nov-Dec 16	42752	42783	42811	42842	42872	42903	july
Yield (%)	73.2	73.5	73.8	74	74.2	74.6	74.8	75.8	76
Target	76	76	76	76	76	76	76	76	76

Lean Tools & Supporting Strategies

- 5S
- Visual control
- Team building
- Problem solving
- Standardised processes
- Value stream mapping
- Total Productive Maintenance
- SMED (setup reduction)
- Pull system
- Kanban
- Line Balancing
- Manufacturing Cells
- 5Ws & 1H
- Poka-Yoke or mistake-proofing
- 7 QC Tools

So what can you achieve through Lean Implementation?

- Minimise Material Rejection | Wastage
- Improve Material Yield (Input – Output Ratio)
- Increase output without any investment
- Reduce Machine breakdowns, changeover times – More Production from less machines
- Improve Manpower productivity (More production from less people)
- System driven, Cleaner & Organized factory
- More customers..
- More Profits..

And much more…