

## ***Benefits Derived from Lean Implementation -Experiences through Case Studies of Auto, Light Engineering & Sheet Metal Industry -An Extract***

*by*

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- We Completed 4 Clusters successfully In Pilot Phase 2009~13, under guidance & time to time support of MSME, NPC & IamSME of India; In Faridabad covered under Lean Manufacturing Competitiveness Scheme (LMCS) of MSME
- Four Faridabad clusters are... Auto Cluster/ Light Engineering /Sheet Metal & Turned Component Cluster / CNC & Advance Technology Cluster

<p><b>The objectives of assignment</b> are to increase the competitiveness of the MSME sector through the adoption of LM techniques with:</p> <ul style="list-style-type: none"> <li>➤ Reducing waste</li> <li>➤ Increasing productivity</li> <li>➤ Introducing innovative practices for improving overall competitiveness</li> </ul> <p>Inculcating good management systems and Imbibing a culture of continuous improvement.</p>	<p><b>Strategic move</b></p> <ul style="list-style-type: none"> <li>✓ Current State Mapping(CSM)</li> <li>✓ Analyzing the Gaps</li> <li>✓ Design of integrated FUTUTRE road map (FSM)</li> <li>✓ Implementation phase</li> <li>✓ Measure &amp; control</li> <li>✓ Shortfalls &amp; CAPA</li> <li>✓ Sustain</li> </ul>
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### • **Journey of lean**

- o The Lean envisages improvement in the Quality of products and lowering of cost, which is essential for competing in national and international markets.

<p><b>LEAN eliminates 7 wastes (TIMWOOD):</b></p> <p>T - Over Transportation</p> <p>I - Over Inventory</p> <p>M - Over Motion</p> <p>W - Over Waiting</p> <p>O - Over Output(Production)</p> <p>O - Over Operation</p> <p>D - Over Defects</p>	<p><b>The Benefits of LEAN (PQCDSE):</b></p> <p>P - Production</p> <p>Q - Quality</p> <p>C - Cost</p> <p>D - Delivery</p> <p>S - Safety</p> <p>M - Morale</p> <p>E - Environment</p>
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## Journey of Lean Excellence Through cluster approach

- **Training methodology**

- ✓ **Step 1**

- o Management Overview...One day common platform to All LMC Member Enterprises
- o These people join ..CEO/TOP MANAGEMENT, Leader & Asstt. Leader of LMC member enterprise, I am SME of India & MSME/NPC, LMC Consultant / trainer, Other industry guests
- o Launching of Lean Manufacturing Cluster (LMC) Programme
- o 4 STEPS OF Launching...Awareness,Engagement,Review of Target vs. Achievement&Focus on targets

- ✓ **Step 2**

- o **Common workshop (each module)**
- o **2 days workshop by expert module trainer /consultant Foot prints of each module....**
- o Manthan / Ice Breaking/Brain Teasers/Power Point presentations / Practical Examples / Group & one-o-one interactions / Psycho -Tests & Games And lot of fun / Motivational Movies & stories / Developing a self assessment check list/Feed back & Discussions
- o 2~4 participants from each Lean Cluster Member Enterprise...2 members -from top management...2 members- direct line operators/supervisors

- ✓ **Step 3**

- o **Plant Visit & Improvement At Site** ...individual lean cluster member
- o Max 3 or 4 half day visits to each LMC Member Enterprise...ROLL PDCA...As per self assessment check list developed at Two days module workshop; check what have been done or in progress...Preparation of Each module final presentation
- o **REPEAT ...STEP 2,3 & 4 for each module**
- o Entire Lean Journey Was Divided Into **Five Modules**
- o Each module is designed for two months
- o We Covered 16 Topics
- o Phase wise targets were drawn against each topic
- o They were duly valided at the end of each module by NPC/MSME against the agreed target set by all stake holders
- o Balanced Score Was Set For Manufacturing Unit





Proud to say  
**I am SME of India**



### Lean Manufacturing Cluster "BALANCED SCORE CARD"

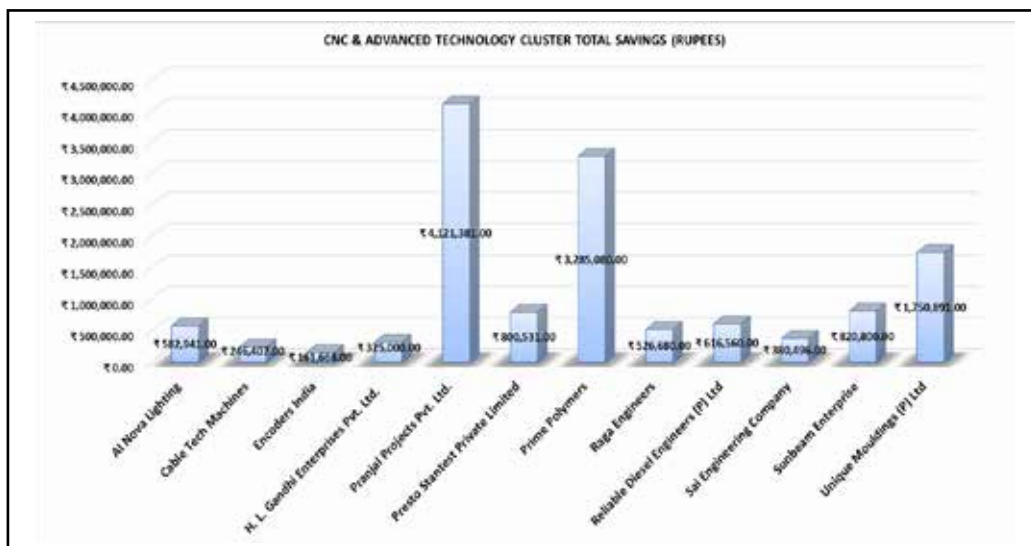
Name Of Organisation:

S. NO.	Key result area (KRA)	UOM	Nov. 2012	Dec. 2012	Jan. 2013	Feb. 2013	Mar. 2013	Apr. 2013	May 2013	June 2013	July 2013	Aug. 2013	Sept. 2013	Oct. 2013
1	Customers complaints	Nos.												
2	Schedule vs. Dispatch	%age												
3	Customer Quality	PPM												
4	End line Defect rate	PPM												
5	In process Defect rate	PPM												
6	Absenteeism	%age												
7	Labour turnover ratio													
8	Multi skilling	%age												
9	Manpower vs. sales	%age of sales												
10A	Energy vs. sales - grid power	%age of sales												
10B	Energy vs. sales - In house generation	%age of sales												
11	Overtime vs. sales	%age of sales												
12	No. of accidents	Nos.												
13	No. of suggestions received	Nos.												
14	No. of suggestions implemented	Nos.												
15	On time delivery	%age												
16	Production efficiency	%age												
17	Cost saving through suggestions/kaizens	Rs.												
18	No. of improvement initiatives taken	Nos.												
19	No. of improvement projects completed	Nos.												
20A	No. of grievances received	Nos.												
20B	No. of grievances redressed	Nos.												

### Achievement at a Glance

GROWTH CHART		Max. Level /Points	lean cluster member	FARIDABAD CNC & ADVANCED TECHNOLOGY CLUSTER												Avg. obtained marks
				1	2	3	4	5	6	7	8	9	10	11	12	
				Al Nova Lighting	Cable Tech Machines	Encoders India	H. L. Gandhi Enterprises Pvt Ltd	Pranjal Projects Pvt Ltd	Presb Sarilest Private Limited	Prime Polymers	Raga Engineers	Reliable Diesel Engineers (P) Ltd	Sai Engineering Company	Sunbeam Enterprises	Unique Mouldings (P) Ltd	
1	5 s Levels	10	Baseline DEC. 2012	2	2	2	2	2	2	2	2	2	2	2	2	2.0
			Current Nov.2013	8	8	6	8	6	8	6	6	8	7	8	8	7.3
2	Work place cooperation	10	Baseline DEC. 2012	2	4	2	2	2	2	2	2	2	2	2	2	2.2
			Current Nov.2013	6	6	6	6	6	6	6	8	8	7	8	6	6.6
3	Health ,Safety & Environment(HES)	10	Baseline DEC. 2012	2	2	2	2	2	2	2	2	2	2	2	2	2.0
			Current Nov.2013	6	6	6	6	6	8	4	6	8	6	8	6	6.3
4	Visual Management	10	Baseline DEC. 2012	2	2	2	2	2	2	2	2	2	2	2	2	2.0
			Current Nov.2013	6	6	4	6	4	8	8	8	8	7	8	6	6.6
5	Productivity Improvement	30%	Baseline DEC. 2012	0	0	0	0	0	0	0	0	0	0	0	0	0.0
			Current Nov.2013	30%	20%	10%	20%	8%	30%	25%	20%	15%	20%	50%	20%	22.3%
6	Single Minute Exchange of Die/mould(SMED)	10	Baseline DEC. 2012	2	2	2	2	2	2	2	2	2	2	2	2	2.0
			Current Nov.2013	6	6	4	6	6	6	6	6	8	5	4	6	5.8
7	Die/mold/tool/fixture MAINTENACE	10	Baseline DEC. 2012	2	2	2	2	2	2	2	2	2	2	2	2	2.0
			Current Nov.2013	6	6	6	6	6	8	6	6	8	3	8	6	6.3
8	My house my machine/work place concept	10	Baseline DEC. 2012	2	2	2	2	2	2	2	2	2	2	2	2	2.0
			Current Nov.2013	6	6	6	6	6	7	8	8	8	8	8	6	6.9
9	Total productive maintenance(TPM)	10	Baseline DEC. 2012	2	2	2	2	2	2	2	2	2	2	2	2	2.0
			Current Nov.2013	6	8	6	6	6	7	6	6	8	4	6	6	6.3
10	Quality	30%	Baseline DEC. 2012	0	0	0	0	0	0	0	0	0	0	0	0	0.0
			Current Nov.2013	20%	20%	10%	20%	5%	30%	15%	12%	20%	25%	100%	20%	24.8%
11	Advanced S.O.P.	10	Baseline DEC. 2012	2	2	2	2	2	2	2	2	2	2	2	2	2.0
			Current Nov.2013	6	8	6	6	6	6	6	8	6	4	8	6	6.3
12	Manufacturing Cost reduction	10%	Baseline DEC. 2012	0	0	0	0	2	0	0	0	0	0	0	0	0.2
			Current Nov.2013	5%	5%	10%	5%	4%	10%	5%	5%	3%	7%	10%	5%	6.2%
13	Energy conservation	10%	Baseline DEC. 2012	0	0	0	0	0	0	0	0	0	0	0	0	0.0
			Current Nov.2013	10%	5%	5%	10%	5%	10%	5%	5%	6%	25%	10%	10%	8.8%
14	Improvement in On Time Delivery(OTD)	10	Baseline DEC. 2012	2	2	2	2	2	2	2	2	2	2	2	2	2.0
			Current Nov.2013	8	6	4	6	4	5	6	6	4	6	4	6	5.4
15	Reduction in Inventory	10	Baseline DEC. 2012	2	2	2	2	2	2	2	2	2	2	2	2	2.0
			Current Nov.2013	8	6	6	6	6	6	6	6	6	7	8	6	6.4

## SOME MORE ACHIEVEMENT



FARIDABAD LIGHT ENGINEERING  
CLUSTER .... 2011~12  
(SPV-IamSME of INDIA)  
(LMC-LBE CONSULTING GROUP)



### Lean Improvements Matrix

Sr. No.	Particulars	Pre-intervention i.e. at the beginning of project or DSR stage	Post Intervention i.e. at the completion of project or Closure report stage	%age Change	%age of beneficiary units*	Lean Tools used
1	Production Capacity	1.00	1.50	150.00	100.00	TQM
2	Salvage value of scrap eliminated (Rs)		3000000.00		100.00	1S
3	Inventory Turnover	12.00	24.00	200.00	50.00	3-FLOW
4	Lead Time (Hrs)	1.00	0.75	75.00	60.00	3-FLOW
5	Machine Utilisation or OEE	70.00	85.00	121.43	60.00	TPM
6	Space Utilisation (Sq. ft.)	1.00	0.80	20.00	60.00	1S
7	Set-up Time (Mins.)	1.00	0.50	50.00	60.00	SMED
8	Over Transportation (Metres)	1.00	0.80	20.00	60.00	7 WASTE
9	Over Waiting (Mins.)	1.00	1.30	30.00	50.00	7 WASTE
10	Quality-In-house Rejection (PPM)	50000.00	10000.00	500.00	50.00	QC TOOL
11	Delivery-Shipped against Order on time	70.00	85.00	121.43	50.00	TQM
12	Savings (Rs)		13850000.00		100.00	PQCDSM
13	Standard Operating Procedure	1.00	100.00		50.00	ASOP
14	Kaizen	0.00	500.00	100.00	100.00	7 WASTE



## KAIZEN

### SOME GLIMPSES OF Continual improvement

#### Kaizen (Continual Improvement)

Date: 4/3/13

Before (Original)	After (Improvement)
<b>NO ROOM FOR SCRAP TIED</b> 	<b>SCRAP IN LOCK &amp; KEY</b> 
<b>SAD S-S &amp; MIXING OF MATERIAL</b> 	<b>DIPOVE BY S-S &amp; NO MIXED MATERIAL</b> 

#### 5S Team

**AGNI**

#### Kaizen (Continual Improvement)

Date: 15/2/2013

Before (Original)	After (Improvement)
<b>Material neither properly identified nor properly kept</b> 	<b>Material identification done</b> 
<b>Wastage of time while searching</b> 	<b>Searching time save</b> 

#### Kaizen (Continual Improvement)

Date: 10.02.2013

Before (Original)	After (Improvement)
<b>HAUGE SCRAP &amp; COMPONENTS</b> 	<b>PROPER WORKING PLACE</b> 
<b>Model Area Components lying here and there. No pathway visitors had to jump on material</b> 	<b>Model Area Pathway created, racks made, visual inventory implemented</b> 

#### Kaizen (Continual Improvement)

Date: 10.02.2013

Before (Original)	After (Improvement)
<b>Scrapped &amp; damaged</b> 	<b>Using Plastic Bin of same size</b> 
<b>Component getting damaged &amp; its identity problem</b> 	<b>Components not damaged, easy visual inventory, getting lost reduced</b> 

#### Kaizen (Continual Improvement)

Date: 10.02.2013

Before (Original)	After (Improvement)
<b>FEAR OF SHORTCIRCUIT</b> 	<b>NO FEAR OF SHORTCIRCUIT</b> 
<b>Electrical panel</b> 	<b>New electrical panel</b> 

### SAFETY BOARD

**Work Together ..... Work Safety**

#### Energy Saving By Installing CFL & L.E.D. Area Lighting

#### Last 8 Years We Use 12 Manpower For During Chemlock Application Manually But Now Time Change 2 Manpower Use For Chemlock Application Improvement 500%

Before	After
<p>12 MANPOWER USE FOR DURING CHEMLOCK APPLICATION</p>	<p>INTRODUCED PAINT BOOTH. 2 MANPOWER USE FOR DURING CHEMLOCK APPLICATION</p>



*Shri S.K. Banerji, Consultant, LBE Consulting Group, Delivering Presentation During National Workshop On Experiences of Lean Manufacturing on 6th Feb, 2014 at India Habitat Center, New Delhi*



*Shri Madhav Lal, IAS, Secretary (MSME) & Other Dignitaries During Technical Sessions*



## *Experiences of Lean*

### *Shri Rohit Goyal, Proprietor, Reva Industries, Faridabad*

Shri Rohit Goyal, Proprietor Reva Industries stated that Lean is one of the best gifts which Ministry has introduced & thought of giving to the industry. He shared various benefits derived after implementing Lean manufacturing programme like productivity improvement, reduction in inventory level, workplace co-operation, etc. He admitted that productivity enhancement was up to 50 % in one of the component. The people from industry can easily understand that inventory is the basic killer in the industry. Inventory level in our company has been reduced up to 33% in last three months after implementing Lean Programme and it was shocking to us how we could bear such a huge inventory.



*Mr. Rohit Goyal,  
Proprietor, Reva Industries, Faridabad*

Also we were trying to get enhancement of capacity in NTPC from last three years which was getting rejected continuously. We got our first order during lean implementation period and yesterday itself we got approval from BHEL, Trichy which was pending since 1993. He stated that apart from monetary benefits one of the major benefits that we observed was work place co-operation. He shared that one of my worker came to me and said “Sir, AB TO AAP HAMSE BAAT BHI KARTE HAIN, HAMARE SAATH HASTE BHI HAIN”. So level commitment and workplace cooperation has risen like anything. Mr. Goyal also invited industry people to visit his factory in Faridabad.

Shri Amarendra Sinha, AS & DC, Ministry of MSME asked a few question from Mr. Goyal.

**Shri Amarendra Sinha:** What did you find the biggest challenge in terms of resistance to change?

**Shri Rohit Goyal:** Sir, First resistance was in our mind because we were not aware how lean works. 5S we were already doing in our company. We used to engage labour in Saturday or Sunday and get the things cleared. But lean concept was totally different where worker himself is the owner of the place. Initially our productivity dropped for first few months because our worker was doing cleaning and other things. I asked Mr. Banerji that, it's not going to work and I can't make my productivity to suffer. Then he gave the concept of model area and we did very wonderfully. The whole factory was divided in zones. When one zone was wonderfully looking, everything else happened automatically and best part was that I was not stressed even for a day in whole period.

**Shri Amarendra Sinha:** What was the attrition rate before lean programme and what change happened during the lean period?

**Shri Rohit Goyal:** Sir, Attrition Rate still exists. But now attrition rate is 2% which used to be 15% when we started lean. During Lean period also it came to 17%, but in December it is 2%.

***Shri Amit Aggarwal***  
***Proprietor, Priyanshu Industries, Faridabad***

Shri Amit Aggarwal, Proprietor Priyanshu Industries stated that his company is manufacturing sheet metal components and they have started manufacturing food processing machines recently. He was also nodal officer for lean manufacturing programme and also looking after “Business Excellence Center” of “IamSME”. He acceded that Industry was not called as educated industry. Before joining Lean Programme we have lots of wastages, rework, rejections, productivity loss, High inventory level etc. Attrition rate was also very high. At that time we did not know what to do, how to resolve our problems and used to blame my team for all such hassles in my company. During that time efforts were also made like hiring consultant. But consultants that we hired within our capacity were not able to perform by that level. Meanwhile when these searches were going on Shri Rajiv Chawla, Director, IamSME told us to join Lean Programme. At that time we joined this scheme, I was nominated as nodal officer. During Lean programme I visited other industries as nodal officer and feel that 60-70 % problems in most of industries were common viz. high inventory levels, improper security, poor efficiency, labour problems etc.



*Mr. Amit Aggarwal,  
Proprietor, Priyanshu Engineering, Faridabad*

After joining this programme outcome is that earlier we were facing problem in retaining our customers, now we are No. 1 supplier for those customers. Even I feel that Priyanshu Engineering has the best Team. Our team has made a target that in 2020 we would be the best food processing machine manufacturer in India.