

7TH D. L. SHAH MEMORIAL LECTURE

on

**Past, Present and Future of Mahindra & Mahindra's Deming journey by
Mr.K.G.Shenoy, Sr.VP-Mfg., SCM & CME and Mr. R. Chatterjee, Sr. GM, (B.E.)**

Lecture Proceedings

Seventh D. L. Shah Memorial Lecture was held on February 27, 2016 at Hall of Harmony, Nehru Centre, Worli Mumbai.

Mr. B.Banerjee, President, NCQM welcomed the guests and dignitaries who included, among others, learned speakers Mr. K.G.Shenoy & Mr. R.Chatterjee of M&M. Mr. H.K.Taneja –Trustee of D.L.Shah Trust (DLST), Mr. Khushroo Khambata-CEO of DLST, Shri Mahesh . V. Gandhi & Dr. H.M.Mehta , Trustees of NCQM.

Mr. H.K.Taneja gave an update on D.L.Shah Trust for Applied Science, Technology, Arts & Philosophy and its activities.

Mr. B.Banerjee , President of NCQM gave an update of NCQM's activities & achievements over past 26 years. Then he briefly introduced the speakers as their CV was already there in the invitation letter itself.

To start with Mr. Raja Chatterjee talked about processes & products of M & M's Tractor & Farm equipment division and their Deming journey towards Business Excellence. He highlighted the need for high level commitment & involvement of Top Management to set business objectives & strategies which are key to “Vision Achievement”. He emphasized their relentless pursuit of TQM towards enhancing employee capability and thereby ensuring “Sustenance”.

In this journey M & M took assistance from several well known Japanese Gurus like Dr. Washio & Dr.Yamada which helped them to acquire Deming Application Prize first and then Japan Quality Medal (presently known as Japan Grand Prize) in not only at their Kandivali Tractor division but also to its other affiliates such as Swaraj (Punjab Tractors) and Mahindra Powerol.

Mr. K. G. Shenoy traced history of M & M's TPM journey till its “kick off” on 11th November 2006 and proudly announced their receipt of Level III TPM Excellence Award in January 2016.

Towards “Customer Centricity”, he stressed Farm Tech's vision as “**Work towards customers' prosperity**” which he felt is the correct route to an organization's World Class journey. He narrated 5 steps such as “Operational Excellence”, “Supply Chain Excellence” , “ Improvement through Lean towards Sustenance” etc , each step requiring 3 years. He further added that “Cultural change” is needed to succeed in “**Theme based innovations**” like automated material handling, making over 70% operations “Mistake Proof or Poka –Yoke” etc.

Towards TPM journey they now intend going for “Advanced Special Award” and move towards “**Smart**” factory through “**Digitization**”.

Their lectures were followed by lively Question-Answer session.

130 plus professionals from over 45 organizations attended this prestigious event.

Details of their lectures are subsequently brought out.

Mr. H.K.Taneja presented silver plaque to each speaker as a gesture of appreciation to them.

Mr. Santosh Khadagade, Hon. Secretary of NCQM proposed vote of thanks to all concerned who made this prestigious event a grand success.

The evening concluded with a social meet over high tea.

Few Snap Shots of the Memorable Event



Mr. H. K. Taneja, Trustee & Mr. K. Khambata, CEO of D. L. Shah Trust garlanding Late Shri D. L. Shah's photo



Mr. B. Banerjee, President, NCQM presenting welcome Lucky Tree to speaker Mr. Rajdeepak Chatterjee



Mr. B. Banerjee, President, NCQM presenting welcome Lucky Tree to speaker Mr. K. G. Shenoy



Mr. H. K. Taneja, Trustee of D. L. Shah Trust giving an update on Late Shri D. L. Shah and the Trust



Mr. B. Banerjee, President, NCQM introducing the speakers



Mr. Rajdeepak Chatterjee delivering the Lecture



Mr. K. G. Shenoy delivering the Lecture



A section of the Audience listening to the speaker with rapt attention



Another section of engrossed audience



Question-Answer session in progress



Question-Answer session in progress



Mr. H. K. Taneja, Trustee of D L Shah Trust presenting Memento to speaker Mr. Shenoy



Mr. Mahesh V. Gandhi, Trustee of NCQM presenting Memento to speaker Mr. Chatterjee



Mr. Mahesh V. Gandhi explaining details regarding BEQET Award which was introduced in memory of his father Late Shri Vadilal Gandhi



Presentation by Team Leader Mr. C. V. Gopalakrishnan BEQET 2015 1st prize winner



Mr. Santosh Khadagade, Hon. Secretary, NCQM proposing vote of thanks

Past, Present and Future of M & M's Deming Journey

Key note Speakers : Mr. Rajdeepak (Raja) Chatterjee, Sr. GM, Business Excellence (BE) and Mr. K. G. Shenoy, Sr. VP, Manufacturing , SCM and CME of Mahindra & Mahindra's (M & M), Tractor & Farm Mechanisation Business (TFMB)

1. Plan for the sessions

The topic was broken up in two parts. First part on M & M's achievement of Business Excellence through Deming journey using TQM route. This part was handled by Mr. Raja Chatterjee. The second part on sustainability through TPM and future plans was highlighted by Mr. K. G. Shenoy. Both of them participated in lively question-answer session which followed their educative, innovative and inspiring presentations.

2. M & M's BE journey through Deming route using TQM approach

2.1 Brief history of the company

M&M was formed in 1945 with automobile business and today it is a most trusted company in India with a work force of over 200000 globally and a presence in over 100 countries with a diverse portfolio of Aircraft to Automobiles and Hospitality to Home Finance. The core values of M&M include Good Corporate Citizenship, Professionalism, Customer First, Quality focus and Dignity of the Individuals.

2.2 Certain startling facts

- M&M is No. 1 for Tractor in terms of volume, highest domestic market share over 30 years
- Mahindra tractors is spread over more than 40 countries, enduring partnership with Mitsubishi, TYM, Yueda Yanchang, and Huanghai etc. and a very strong presence in USA.
- It has India's most advanced tractor R&D facility in Chennai; developing technologically advanced tractors for domestic as well as overseas customers.
- World's first and only tractor manufacturer to win the prestigious Deming Application Prize and Deming Grand Prize formerly known as Japan Quality Medal.
- Head quarters in Mumbai with a sales network of over 1500+ and service network of over 1800+

2.3 Milestones of M&M's Deming journey

1963: Formation of International Tractor Company of India Ltd
 1953: Achieved leadership position in Indian tractor market.
 1994: Autonomous sector of M&M- Farm Division (FES) Subsidiary company Mahindra USA (MUSA) formed
 1997: The Vision of Global Leadership conceived
 2003: Won the Deming Application Prize
 2004: Entry in China- JV established (MCTCL)
 2007: Won the Japan Quality Medal (Now named as Deming Grand Prize)
 2008: JV with Yancheng Tractor Company China
 2009: M&M the no.1 tractor company in the world by volume.

2.4 Vision, Mission and Goals

Sharper definition of vision enunciated in 2005 was **“Become World's largest tractor company by 2009”**. Immediate Mission was to have more Mahindra brand tractors to be sold around the world compared to any other single brand of tractors. Key goals set in 2005 for 2009 : Volume No.1, CSI No.1, High ESI, ROCE at Benchmark Level.

2.5 TQM Way-Path to Vision

TQM model comprised five pillars as Standardization, Policy Deployment, Daily Work Management, PDCA and Kaizen with Total Employee Involvement.

Establishment of TQM at M&M went through the following five phases :

- 1990- 1994: Introduction Phase: Improve Quality of Products
- 1995- 1999: Promotion Phase: Improve Quality of Processes
- 2000- 2003: Development Phase: Improve Quality of Management
- 2004- 2007: Consolidation Phase: To achieve Vision
- 2008 onwards: Post JQM Phase: To achieve Vision and Excellence everywhere

2.6 Unique TQM activities

Towards achievement of vision, unique TQM activities were as follows :

- Quality Assurance System- End to end Quality Chain
- Improving M&M Sales System (MSS) an unique Activity for market growth
- Building an emotional bond with the customer- CSO to be no.1
- Strengthening New Product Development Process - Block Buster Products
- Manufacturing Excellence through Total Productive Maintenance
- Employee Development and Involvement
- Further Strengthening focus on Overseas Business
- Corporate Social Responsibility Budget 1% of PAT

Coupled with top management Involvement and continuous communication

2.7 Why Deming Prize

This route was to build M&M's existing quality improvement initiatives, encourage organization to achieve “global level” recognition, institutionalize proven best TQM practices in the organization and finally realization of vision through top management involvement.

2.8 Benefits of Deming Prizes

- Improved quality, development of new products, reduced costs and started Engine business.
- Led to retain market leadership, sustained and increased market share, helped to maintain profitability.
- M & M's tractor business ranking 6th in 1997 became 5th in 2003. Excellence journey continued.
- Most importantly Deming Prize helped M & M to survive the 2002 crisis.

2.9 Extension of Deming Journey to Swaraj Tractor

Being encouraged with the success of Deming route through TQM at M & M's TFMB at Kandivli, the excellence journey was extended to "Swaraj" tractors which was known as Punjab Tractors Ltd., (PTL) till 2000. In 2007, M & M, acquisitioned PTL as its top management decided to regain its past glory.

Historical background of Swaraj Tractors is tracked below :

- 1970: Punjab Tractors Ltd (PTL) established by Punjab Govt.
- 1974: First Indigenous Tractor –724 introduced
- 2000: PTL (Swaraj) became Indian Blue Chip Company
- 2007: Acquisition by M&M Ltd (Majority stake)
- 2007: Vision Formulated & TQM journey initiated
- 2009: Company merged with M&M & became M&M Swaraj Division
- 2011: Swaraj achieved highest CSI in tractor industry
- 2012: Won Deming Prize from JUSE and TPM Excellence Award from JIPM
- 2013: Rolled out 1 Millionth Tractor
- 2014: Won TPM Consistence Award from JIPM

Deming journey benefit was spectacular. Swaraj which was No.5 in 2002 presently holds No.2 position It cleared 2015 Deming surveillance assessment of JUSE. The assessors were very appreciative of the company's higher maturity in TQM activities, implementation and results.

2.10 Extension of Deming Journey to "Powerol"

The unprecedented drop in tractor business in 2002 led to inception of Mahindra's Powerol business. Deming journey got extended here also. Some of the breakthrough improvements achieved by Powerol after winning Deming Prize in 2014 are:

- Quality improvement & Customer Centricity:
Customer quality No.1 in CSI
- Schedule adherence : As high as 98%
- Employee involvement : 75% improvement in number of Kaizen done per employee, Zero FSI, ESI-84 (amongst top 3 in AFS)
- Market share : 30% improvement in Telecom MS / and No. 1 in Telecom Segment.

2.11 Key learning from this excellence journey

Top management Leadership, belief and commitment; systematic strategies & objectives to achieve vision Alignment

of individuals roles with business priorities, Thorough understanding of customers & their requirements, Strong Quality Management systems, TEI: High skill, morale and kaizen; Companywide use of TQM practices ent;, Thus leading from Customer Satisfaction to Customer Delight.

2.12 Promoting TQM beyond

TQM experts from all over the world visited FES for a study on "Best Practices"

Principles & practices of TQM continues at M & M from Market Leadership to Sustained Profitable Leadership to Global Leadership with a Vision of becoming a "World Class Company"

3. Sustainability through TQM and Future Plans

3.1 Start of TPM at M & M

M & M started the process of TPM in the year 2006 Shri Gautam Natekar did the kick off on 11th November 2006. The TPM Vision was that M & M's customers must prosper which will automatically bring prosperity to M & M

3.2 Five step TQM process

Towards sustainability through TPM, M & M adopted the following five steps TPM process spending 3 years for each step.

- Step 1: 2006-10: Operational Excellence
(TPM Excellence Award in 2010)
- Step 2: 2011-2012: Sustain & Improve Operational Excellence
Acquired TPM Consistency Award in 2012.
- Step 3: 2013-15: Supply Chain Excellence
(TPM Special Award)
- Step 4: Total Profit Management
(Advanced TPM Special Award)
- Step 5: World Class Company (World Class TPM achievement)

Majority of improvements showed 90% and above

During TQM Excellence Award the first journey focused on zero accident, zero breakdown, zero defect zero setup time My machine- "I will maintain" is the motto for the operator.

These significant results were achieved in first phase itself.

In the second phase developed Organization wide TPM policy

Phase 3 Journey focused on TPM Consistency Award:

To start with the scope of TPM initiative was broadened.

Activities were oriented to eliminate and prevent constraints and losses which impede total cash flow in the entire manufacturing flow:

Sustained the achievement - aligned to the organization to TPM thinking

Initiatives aimed to achieve – "Absolute zero" in defects, breakdown, safety & losses

Results could be seen immediately. Examples are:

- No. of breakdown on A category machines : 98% reduction
- No. of breakdown of all machines : 87% reduction
- Rework of machined components: 84% reduction
- Total Inventory in days: 40% reduction
- Reportable accidents in numbers: 45% reduction
- Kaizen per team in numbers: 100% improvement
- Total loss Cost: 28% reduction

Significant improvement in all PQCDSM (productivity, quality, cost, delivery, safety and morale) parameters

Phase 4 Journey concentrated TPM Special Award

- It encompassed entire Business Chain Approach towards
- TPM Special Award:
- End to end Supply Chain
- Suppliers: Compact TPM for identified suppliers
- Manufacturing: Strengthening through existing pillars
- Dealers: Initiative of Symphony II
- Lean Management system across the product flow & New Product development and sustainability

3.3 Lean Manufacturing

- Lean is a process of eliminating wastes by creating Value:
- There are several Lean tools
- VSM (Value Stream mapping) is at the base of Lean

3.4 Theme based innovations for Lean

Tag lines for its functional coverages were as follows:

- Planned Maintenance : **Machine to tell when unwell. This is an M & M's own patented technology.**
- Kobetsu Kaizen:
 - Much more with much less
 - Man less machine shop
- Safety, health & environment: Safety at Mahindra
- Supply Chain Management :
 - Automated material handling
 - Kitting in Assembly area
 - Auto declaration of complete line
- Sustainability : Save power, be Stronger

3.5 Results achieved through TPM Special Award

- Single digit field quality RPH sustained
- Defects reported at dealers end: 85% improvement
- Logistic cost: 32% reduction
- Manufacturing Conversion Cost: 22% reduction
- Availability of tractor at dealership: 90% within 24 hrs
- Supplier to stock yard lead time: 45% reduction
- Zero accidents since 100+ days

Note: These Significant improvement in all PQCDSM parameters & hence won the prestigious Special Award for Farms Division.

4. Future plans

Most of them are confidential. Hence not detained here. Broad focus is to convert M & M into a “**Smart factory through digitization**”. In manufacturing it will encompass.

4.1 Materials Management & Logistics

- Auto planning through APO
- Auto creation of production plan
- Auto scheduling of vehicles
- Real time tracking of vehicles for travel time & location
- Auto freight bill passing

4.2 Equipment Management

- TEM: Time Based Monitoring
- CBM: Condition based monitoring
- Machine to tell when unwell
- Real time MTBF & MTTR measurement & Analysis

4.3 Quality Management

- No fault forward/ Error proofing
- Genealogy
- Real time quality data & analysis from shop floor, assemblers and dealers

4.4 Resource Management

- Optimization of manpower
- Group leader concept
- Lean Parameters
- Safety/ Poka Yoke
- Sustainability
- Paperless shop floor
- Energy and water consumption

4.5 Creative TPM Award

Digitalization will involve as soon as the operators enters the plant and punches, computer will tell him where to go and he will have to go to that machine and again punch card for the machine to start.

Similarly as and when a customer enters order, the system will allocate orders to suppliers, work to the operators.

The futuristic organization will not be with plant heads but more on materials management head, Quality management head etc who will plan and execute both at central level as well as plant level functioning.

Tomorrow office will be more like a control room and virtual room.

M&M will in 2 years possibly win Advanced Special Award. i.e. Creative TPM .

Compiled by Mr. B. Banerjee