National Institution for Quality & Reliability

Chennai Branch

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Mar Apr 2016

National President Speaks...

Greetings and warm wishes to all of you.

To spread the Quality Culture & best practices across Indian Industry and to become Globally Competitive, NIQR is organizing the 15th NIQR National Convention - with the apt theme "Skill India for Sustainable Global Quality", which is scheduled on 10th & 11th June 2016 at Hyatt Regency Chennai, Anna Salai, Chennai 600018. This convention covers exciting sessions from domain experts from various sectors - Manufacturing, Service, Consumer Goods, Health & Pharmaceuticals, Business Schools, Automotive, Infrastructure, Agriculture, Electronics, Banking, IT and NGOs.

With the experience of successfully conducting 14th National Convention earlier, NIQR is once again gearing up to organize this 15th Convention in a grand manner, with an objective to strongly induce the importance of quality among everyone in the country.

The participants would get exposed to insights & learnings from the experts, dynamic changes in products & services in the present environment, ongoing happenings in the different business sectors. I am sure that from this event, the participants would take with them the valuable experience & success factors on today's evolving trends & key challenges - the need of the hour to excel beyond customer expectations.

The convention will conclude with the presentation of the various NIQR awards for different organizations & individuals for their outstanding contributions in the field of quality. Looking forward for an overwhelming participation from all of you with full vigor to make this event a grand success.

Regards,
R Sivanesan
National President - NIQR

From Chairman....

Hearty wishes,

Our National Convention scheduled on 10th and 11th June, 2016 is just 45 days away and time has come for us to act and showcase our commitment in the field of Quality.

There has been lot of progress achieved towards conducting the convention and review meetings of various committees were conducted at regular intervals. The enthusiasm shown by the members of the various committees is commendable and I am sure maintaining the same tempo will bring laurels to all of us during the convention.

I take this opportunity to request support of the entire NIQR fraternity to lend their helping hands in making our National convention a grand success.

with warm regards,
S. Rajasekaran

From Secretary...

Cool and comfortable months are behind us; the Sun has started showing his intentions for the season ahead. Hopefully, we will have a healthy season ahead.

Wishing all of you a happy Dhunmuki Tamil New Year; in line with the meaning of Dhunmuki, NIQR will be in the forefront in sharing and spreading the knowledge & skills across Industries.

So far, we had 13 review meetings for the 15th NIQR National Convention. Even though, we started our preparations late due to the Nature's fury, we are catching up with our progress.

The Student Chapters front continues to be abuzz with lot of activities. We had overwhelming response for the NIQR-T. S. Krishna Best Student Award with the receipt of e-papers from 93 students.

The Joint Conference by Saveetha University and NIQR was conducted on 11th April, 2016 at Saveetha University. Another first in our activities; we conducted a training program on Construction Project Management and the response was good.

As usual, Newsletter and Evening Lectures are on track and with the kind of support we receive from all of you, we hope to achieve higher levels of performance.

with kind regards,

C.V. Gowri Sankar

NIQR Welcomes

Dr. Vinod Surana as Individual Life Member,
JM Frictech India Pvt Ltd and
Aksheyaa College of Engineering as Institutional Members
& 2 Individual Annual Members
who joined during Mar Apr 2016

Monthly Evening Lecture Programs February 2016

Mr. V. K. Venkataramani, a Commerce Graduate and a Masters Degree holder in Marketing Management and Human Resource Management has 20 years of work experience as Corporate Consultant. Prior to this, he was with Canara Bank, where he had 24 years of continuous Excellent Rated Service. He is presently heading Across World Quality International as CEO. He is a Certified Lead auditor for ISO 9001 & other Standards and is fondly referred as ISO VKV. He regularly conducts in-house and outbound training programmes to corporate & retail giants.

On 29th February 2016, Mr. V. K. Venkatramani, CEO, Across World Quality International, Chennai and EC Member - NIQR Chennai Branch delivered a lecture on "Consulting for Growth & Excellence" at NIQR Conference Hall. Mr. S. Rajasekaran, Chairman – NIQR Chennai Branch presided over the lecture prog and welcomed the members present. Mr. C. V. Gowri Sankar, Secretary - NIQR Chennai Branch introduced the speaker Mr. V. K. Venkataramani.

Mr. V. K. Venkatramani started his lecture with a note 'Consultancy is the in thing in today's Corporate World' and explained the 10 most important Qualities of a Consultant, dwelling on 'a global mindset', 'Think Big' and 'Self-Confident'. He was forthright in depicting the characteristics of a successful consultant with the Quote; "Excellence in Performance does not ensure Excellence in Consulting". He asserted that a successful Consultant has to be consistently good in **Review, Research, Reskill, Renew, Reinvent and Relationship.**

Elaborating the key consulting skills, he concluded advocating that consultancy in general demands 80% listening / 20% speaking, always anticipating the unknown and starting with the End in Mind.

Mr. G. Rangarajan, National Secretary – NIQR summed up the proceedings commending Mr. VKV for the passion shown by him towards his profession.

The NIQR Newsletter "Q Zine" for the months of January – February 2016 was released by Dr. R. Srinivasan, National Treasurer - NIQR at the end of the lecture.

Monthly Evening Lecture Programs March 2016

On 29th March 2016, Colonel K S Chakravarthi (Retd), Management Consultant, delivered an excellent lecture on "Evolution of Mobile Technology 1G and beyond and its Impact on the Quality of Life" at NIQR Conference Hall.

Mr. C. Sundaravadivelu, Treasurer- NIQR Chennai Branch presided over the lecture and welcomed the members present and Mr. C. V. Gowri Sankar, Secretary - NIQR Chennai Branch introduced the speaker.

Col K S Chakravarthi (Retd), former Executive Committee Member of NIQR HQ, has a PG Diploma in Computer Applications, PG Dip in Production Management and Business Administration from Madras University. He had served as an officer in Indian Army in the Corps of Electronics and Mechanical Engineers and retired as a Colonel after serving nearly three decades. A soldier cum Electronics and Communication Engineer to the core, he served in various capacities which include Deputy Chief Quality Control Engineer (Quality Assurance) and Production Engineer (Indigenisation and Manufacturing) at Army HQ Technical Group EME, which is the Apex Technical Body of the Indian Army.

Splitting the session into 3 parts, 'Yesterday, Today & Tomorrow', Col. K S Chakravarthi started with the communication scenario in the nineteenth century when mainly Postal and Telegraph departments helped the society with the first means of distant communication. He dwelled on manual telephone, the development of technology through wireless, advancement of frequencies, voice to SMS, digital technology, capacity enhancement, software Apps, etc, in a seamless way keeping the audience speechless. He enthused the audience with how a status symbol like telephone has become a necessity to mankind in a short span of time and the impact it has on the basic quality of common man's life.

In Today's scenario, the wireless has a punch on quality of life of every individual - use of remote for TV, AC, mouse, etc. Use of IP has resulted in having all multimedia in mobile phone and use of any software anywhere with high speed, quality, capacity combined with low cost. He gave a good account of 5G wherein 8 multiple inputs like voice, SMS, video, camera, etc induce the communication world from divergent to convergent of Networks, Devices, Technology and Users. He described how India is fast catching up in the last ten years in the world of Communication.

Chaks (as he is fond of being called), gave a picture of tomorrow where the entire spectrum of 'Quality of Life of man' is likely to be influenced by the advent of Omni-present, Omni-potent sensors. The day is not far off when in normal life, one is monitored continuously like in fiction movies. He concluded with the advancement of IOT(Internet Of Things) which is likely to play a major role tomorrow. The possibilities of mobiles in the field of information dissemination socially are astounding.

Mr. K. Sridharan Balaji, former Secretary – NIQR Chennai Branch summing up the proceedings appreciated the enormous amount of preparations done by Col. K S Chakravarthi at the age of 77, which kept the audience thrilled and wanted one more longer session. The passion of the Colonel on the subject was very much discernible as he collected feedback from the participants through emails.

NIQR – T. S. Krishna Student Award – Best Essay Competition

NIQR has instituted various Awards to recognize and honor world class organizations and distinguished individuals, which are conferred during the National Conventions. One such award, NIQR - T. S. Krishna Award – Best Essay Competition was instituted in 1982 in honor of Shri. T S Krishna, Founder Chairman of Sundaram Fasteners Ltd and the Doyen of the TVS group.

For this 15th NIQR National Convention, in the first meeting held on 5th Feb 2016, the Chairman of the TS Krishna Student Award Committee Mr. P. K. Aggarwal, spelt out the methodology for selection of the Awardee. The selection committee consisted of the following members.

- ***Mr. C. V. Gowri Sankar, NIQR Student Chapters Coordinator***
- ***Dr. P. Ramesh, Co-opted National Council Member - NIQR***
- ***Prof. C. Uthayakumar, Principal, Sakthi Engineering College***
- ***Dr. S. Mohana Murugan, HOD - Automobile Engineering, Saveetha School of Engineering, Saveetha University***
- ***Dr. S. P. Srinivasan, HOD- Mechanical Engineering, Rajalakshmi Engineering College***

The committee decided to give wide publicity to all institutions through posters, emails and WhatsApp inviting e-papers on the theme: “Skill India for Sustainable Global Quality”.

On an overwhelming response, we have received 93 e-papers from 12 institutions which is a record in its history. In view of this excellent response, the Awards Committee decided to select 3 students for NIQR Award over and above the coveted NIQR – T. S. Krishna, Student Award.

The jury team consisting of Mr. N. Jagannadha Rao, EC Member - NIQR Chennai Branch and Prof D. R. Kiran, National Council Member- NIQR spent quality time for 4 days to evaluate the papers received and shortlisted 21 out of 93 for the next level of competition.

The Power Point Paper Presentation was organised on 4th April 2016 at NIQR Conference Hall. Mr. C. V. Gowri Sankar welcomed the participants and gave a brief about NIQR and the Award. Mr. S. Rajasekaran presided over the Inaugural Function and insisted the students to participate in all events of NIQR; he explained to them the importance of the theme for the Nation as a whole and students in particular.

The jury panel of Dr. A. Sanjeeva Rao, Past National President- NIQR, Mr. Shanmugavel, Principal, Ramakrishna Mission Polytechnic College, Mylapore and Mr. A. Pradeep, EC Member - NIQR Chennai Branch had a tough time in evaluating the presentations. The students were very clear about the topic and its relevance in today's employment opportunities which were revealed in the lively Q&A session. The feedback from participants clearly showed that they have learnt the new concepts about skill development and TQM.

Mr. K. N. Krishnamurthy, Past National President, NIQR presided over the Valedictory Function and expressed his happiness at the depth of preparation and quality of presentation of the participants. He presented the Participation Certificates to all 19 students and mementos to all students & jury members.

RTAMI-2k16 National Conference

National Conference jointly organised by Saveetha University and NIQR

The above national level conference was jointly organised by Department of Automobile Engineering, Saveetha School of Engineering, Saveetha University and NIQR on 11th April 2016 at Saveetha University, Thandalam, Chennai.

The theme of the conference was 'Recent Trends in Automotive Manufacturing in Industries' and 105 papers were received from all over India.

The papers were scrutinized and 34 papers were selected for the final presentation on the day of the conference. The conference started auspiciously with the lighting of Kuthuvilakku by the distinguished Guests. Dr. S. Mohanamurugan, Professor & HOD of Automobile Engineering welcomed the guests, delegates and participants. Mr. S. Madhu, Associate Professor, presented details about the conference.

Mr. S. Rajasekaran, Chairman, NIQR Chennai Branch in his keynote address, highlighted the advances made in Automobile sector in India in the last 2 decades and the upsurge in the quality side. Mr. C. V. Gowri Sankar, Secretary NIQR Chennai Branch spoke about the activities of NIQR and the Student Chapters and asked the students to make use of the services offered by NIQR.

Mr. P. Nageshwar Rao, Chief Technical Officer, TAFE was the Chief Guest; he gave a lecture on 'smart manufacturing'. He presented an overview of complete product development cycle which synergies and interconnects data, process, machines and people to improve the operational efficiency.

Dr. P. Ramesh, NIQR National Co-opted Member gave a special lecture on Automotive Trends in India, He touched upon some of the Government initiatives to boost automotive sector and future technologies such as electrification of cars. He gave a hint of the Challenges to meet BS VI by 2020.

He explained the Indian Automotive parts manufacturers' perspective to meet global requirements including performance, quality, environmental regulations, Life cycle management etc.

A book on "Total Quality Management – An Integrated Approach" authored by Prof. D. R. Kiran, NIQR National Council Member, was released by the Chief Guest on the occasion.

Mr. C. V. Gowri Sankar, Secretary NIQR Chennai Branch and Mr. N. Jagannadha Rao, ECM NIQR Chennai Branch were the judges for the paper presentations. The students showed depth of knowledge in the subject and had done a good amount of search to present technical details.

In the afternoon session, Dr. N. Rangaswamy, Director, Institute for Knowledge Potential Management & former Joint Secretary of NIQR Chennai Branch delivered a lecture on "Human Reliability Management on Operational Excellence". Mr. V. Vignesh, Mr. T. V. Vikram Narayan, Mr. A. Mothilal & Mr. R. Ezhilvannan of Velammal College of Engineering and Technology were declared winners of the paper presentation contest for their 'research paper on Safety and Security in Automobiles'.

Dr. S. Mohanamurugan, HOD gave the prizes and participation certificates.

Mr. S. Madhu proposed the vote of thanks.

One day Training Program on "Construction Project Management"

NIQR Chennai Branch organised a one day training program on "Construction Project Management" on 9th April 2016 at Hotel Radha Regent, Chennai. This is the second program, NIQR is organising in non-auto industry after the training program in Cement Industry in November 2014.

Mr. S. Kavinkumar, an M Tech from IIT Madras and Director of EPMCR, an IIT Madras-incubated company that specializes in construction methods, management and related services was the resource faculty. There were 23 participants from 11 organisations.

Mr. C. V. Gowri Sankar, Secretary - NIQR Chennai Branch welcomed the participants and briefed them about NIQR and its activities and asked the participants to concentrate on the waste generation and its prevention to improve profitability. Mr. S. Rajasekaran, Chairman - NIQR Chennai Branch inaugurated the program and touched upon the technical advances made in auto parts manufacturing sector in the last 3 decades and wanted the construction industry also to emulate it. In his keynote address, Mr. Ramakrishnan, M D of Harmony Homes commended NIQR for focusing on this field and wanted the participants to concentrate on the nuances of project management as the trend is fast catching up with other industries like IT, Medical, etc.

The faculty started the session with the question whether Project Management is an art or science. Even though it resembles an art, Mr. Kavin explained how it is made a science by today's demands. He elaborated on the features of Project Management from 'resources to end results'. He explained the 5 Phases of a project, namely Initiating, Planning, Executing, Controlling and Closing and elaborated on the requirements of each phase in today's construction Industry.

Two case studies were presented by his deputies. Mr. Jerry Joykutty presented a Case Study on Factory Reduction at a Heavy Equipment & Machinery Manufacturing Facility - Modification of Production Plant to a Warehouse. Mr. T. Unnikrishnan presented a Case Study on Expansion Project at a Battery Manufacturing Facility.

Both Case Studies mainly focused on applying Project Management Principles in the Proposed Projects.

Mr. G. Rangarajan, National Secretary, NIQR National Body presided over the valedictory function and presented the Certificates to the participants.

The feedbacks from the participants were very encouraging and wanted NIQR to organize more such programs which would hone their skills for effective Project Management.

NIQR - Dr. MGR Educational & Research Institute University Student Chapter

Lecture on Quality & Reliability by Dr. N. Rangaswamy

On 6th April 2016, Dr. N. Rangaswamy, Director, Institute for Knowledge Potential Management & former Joint Secretary - NIQR Chennai Branch delivered a lecture on “Quality & Reliability” to the student members of Dr. MGR Educational & Research Institute University Student Chapter organised at the University Auditorium. Dr. M. Ganesan, HOD & Chair Person NIQR Student Chapter welcomed the members present. Ms. R. Suganthini Rekha, Asst. Professor & Organizing Secretary NIQR Student Chapter introduced the speaker to the audience.

In his lecture, Dr. N. Rangaswamy gave a picture of Total Quality management (TQM) in industries today and the importance of Reliability through various examples. The lecture was followed by activities for the students related with Total Quality Management. The students actively participated and as a token of appreciation gifts were distributed to the Winning students.

The lecture was well attended by 150 NIQR student members and the Faculty members of mechanical engineering department. The students and faculty members very much involved and expressed their desire to have more lectures on TQM concepts during next academic year. Professor S. Suresh proposed the vote of thanks.

Book Published by Prof. D. R. Kiran , National Council Member - NIQR

On the occasion of the 2nd National Conference jointly organized and conducted by Department of Automobile Engineering, Saveetha School of Engineering & National Institution for Quality and Reliability on 11th April 2016, at Saveetha University, Thandalam, Chennai , a book on "Total Quality Management – An Integrated Approach" authored by Prof. D. R. Kiran, National Council Member - NIQR, was released.

A special feature of this book is the importance given to the fundamentals of statistics, so that the reader is fully equipped to understand better the vital topic of statistical quality control. Both the fundamental management concepts like Systems Approach to Management, Decision Theory etc. together with the modern concepts of Quality Function Deployment, Taguchi's Loss Function etc. are highlighted in this book.

Mr. P. Nageshwar Rao, Chief Technical Officer, TAFE and Chief Guest of the Conference released the first copy which was received by Mr. S. Rajasekaran, Chairman, NIQR Chennai Branch.

Other books published by Prof. D.R. Kiran include "Professional Ethics and Human Values" and "Maintenance Engineering and Management – Precepts and Practices".

QCI – NABET – NIQR

Excel Lean Auto Cluster, Hosur Project

Activities at Hosur and Bangalore are progressing well under the guidance of NIQR HQ. Counselors make regular visit to cluster companies and guide them for improving their operations in line with the Road Map.

Cluster companies get benefit of their staff getting trained in the subjects related to Lean manufacturing. This training is offered to the cluster member companies free of cost. As a first program, 5S training was conducted by Mr. S. Murugan, ECM of NIQR Chennai Branch on 9th April 2016 at Conference Hall of Hosur Small and Tiny Industries Association where 18 participants benefitted. After theory session in the forenoon, the participants were taken to Sri Balaji Fabrications Works for a hands-on practical session. The training was well appreciated and the participation was excellent. The training program was so good that many cluster companies have requested for a separate session in their own premises to cover all the employees of the respective companies. The program was coordinated by Mr. M. V. Prakash, NIQR Senior Counselor.

Members in News :

On 4th March 2016, **Dr. K. S. Babai,** National Council Member - NIQR and Principal, Meenakshi Sundararajan Engineering College & her elder sister **Dr. K. S. Lakshmi**, Secretary, Meenakshi College for Women were awarded "சாதனை சகோதரிகள் விருது" by Rotary International Dist.3230: Women Empowerment Team, Rotary Club of Chennai K. K. Nagar at Chennai.

Prof. C. Uthayakumar, Principal , Sakthi Engineering College and EC Member - NIQR Chennai Branch was the Chief Guest for the 'BHARATH MECHOFEST 2k16' - A National Level Technical Symposium conducted on 1st April 2016 at Chennai by the Department of Mechanical Engineering, Bharath University, Selaiyur, Chennai.

Dr. V. Swaminathan, National Vice President - NIQR and **Mr. S. Murugan,** EC Member -NIQR Chennai Branch participated and presented a paper on "Manufacturing Excellence Activities" at the Asia Monozukuri Conference organized and conducted by ABK – AOTS – DOSOKAI Chennai Centre at ITC Grand Chola, Chennai on 15th March 2016.

Know the Quality Gurus - 6

Dr. Genichi Taguchi (1924 ~2012)

Dr. Genichi Taguchi is a Japanese quality expert known for his work in the area of product design. He estimates that as much as 80 percent of all defective items are caused by poor product design. Taguchi stresses that organizations should focus their quality efforts at the design stage, as it is much cheaper and easier to make changes than later, during the production process.

He developed the "Taguchi methodology" of robust design, also known as "designing in quality", which focused on making the design less sensitive to variation in the manufacturing process instead of trying to control manufacturing variation. In 1950, Taguchi was employed as visiting professor at Indian Statistical Institute. Taguchi also developed a methodology for applying statistics to improve the quality of manufactured goods. Taguchi methods have been controversial among some conventional Western statisticians, but others have accepted many of the concepts introduced by him as valid extensions to the body of knowledge.

Taguchi is known for applying a concept called design of experiment (DOE) to product design.This method is an engineering approach that is based on developing robust design, a design that results in products that can perform over a wide range of conditions. Taguchi's philosophy is based on the idea that it is easier to design a product that can perform over a wide range of environmental conditions than it is to control them.

Taguchi has also had a large impact on today's view of the costs of quality. He pointed out that the traditional view of costs of conformance to specifications is incorrect, and proposed a different way to look at these costs. Let's briefly look at Dr. Taguchi's view of quality costs.

Figure 1

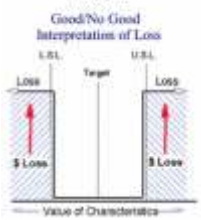
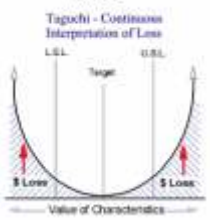


Figure 2



Conformance to specification specifies a target value for the product with specified tolerances, say 5.00 +/-0.20 mm. According to the traditional view of conformance to specifications, losses in terms of cost occur if the product dimensions fall outside of the specified limits. This is shown in Figure 1. We call this 'Goal Post Mentality" means if dimensions are within the specification, it is acceptable. However, Dr. Taguchi noted that from the customer's view there is little difference whether a product falls just outside or just inside the control limits. He pointed out that there is a much greater difference in the quality of the product between making the target and being near the control limit.

He also stated that the smaller the variation around the target, better the quality. Based on this he proposed as conformance values move away from the target, loss increases as a quadratic function. This is called theTaguchi loss function and is shown in Figure 2. According to the function, smaller differences from the target result in smaller costs: the larger the differences, the larger the cost. The Taguchi loss function has had a significant impact in changing the view of quality cost.

Taguchi contributions:

He has made a very influential contribution to industrial statistics. The key elements of his quality philosophy are:

* **Taguchi loss function :**
  Used to measure financial loss to society resulting from poor quality.
* **The philosophy of off-line quality control :**
  Designing products and processes so that they are insensitive to parameters outside the design engineer's control. This comprises System design, Parameter design and Tolerance design.
* **Innovations in the statistical design of experiments :**
  Notably the use of an outer array for factors those are uncontrollable in real life.

Strategic Quality Framework - 6

How to measure the Quality of Product and Services?

In recent days all the organizations are trying to upgrade the product quality and services through various programs like cost of quality, reliability engineering, First time right and using 7 QC tools and Design of Experiments. But some of the organizations have failed because lack of seriousness and perceive these programs are defensive measures to remove defects.

So the concept called Strategic Quality Framework (SQF) emerged. Dr. Garvin developed this framework of 8 dimensions to measure the quality of product and services.

1.	**Performance**	**5.**	**Durability**
2.	**Features**	**6.**	**Serviceability**
3.	**Reliability**	**7.**	**Aesthetics**
4.	**Conformance**	**8.**	**Perceived Quality**

In the previous newsletters, we have studied the importance of the **Performance, Features, Reliability, Conformance and Durability** dimensions. In this issue, let us concentrate on **Serviceability** dimension. Serviceability is the function of Speed, Ease, Cost and Friendliness of Service of a product.

It refers to the promptness, courtesy, proficiency and ease in repair when the product breaks down and is sent for repairs. Consumers are concerned not only about a product breaking down, but also about the elapsed time before service is restored, the timeliness with which service appointments are kept, the nature of their dealings with service personnel, and the frequency with which service calls or repairs fail to resolve outstanding problems. Some of these variables can be measured quite objectively; Others reflect differing personal standards of what constitutes acceptable service.

For example, a recent study of consumer satisfaction with professional services found the major complaints to be that “the service was provided in a careless, unprofessional manner” and that “I feel I was treated as an object rather than as an individual.” These comments clearly reflect subjective views of what constitutes acceptable professional behavior. Other aspects of service can be assessed more objectively. Responsiveness is typically measured by the mean time to repair (MTTR), while technical competence is reflected in the incidence of multiple service calls required to correct a single problem.

Important attributes for serviceability are:

- Service warranty, parts warranty and parts availability
- Reasonable distance to reach dealer service centers / service parts center
- Length of wait for service appointment
- Schedule of preventive maintenance
- Service executives to listen to customers, provide information regarding repairs
- Courteous service centers
- Repaired correctly first time and service on time in comparison with other dealers
- Warranty claims handled without argument
- Average repair cost/year, extended warranty
- Underestimation of service cost and provision of loan car

For example

- Caterpillar Tractor's promise that it will deliver repair parts anywhere in the world within forty-eight hours
- Mercedes' guarantee of twenty four hour (overnight) service in California and Arizona show that even top of the line producers believe that this approach has value.
- Maruti's unique selling point (USP) is serviceability and competitors are focusing improving the serviceability to stay in the market.

What it is? - 6

Cross-docking

This is the recent methodology used in Supply Chain Management to reduce the transportation lead time and total logistics cost. This is the practice of **unloading** materials from incoming trucks or rail cars and **loading** these materials onto outbound trucks or rail cars, with **little or no storage or warehousing** in between.

This refers to moving product from a manufacturing plant and delivering it directly to the customer with little or no material handling in between. Cross docking not only reduces material handling, but also reduces the need to store the products in the warehouse.

This may be done to

* sort material intended for different destinations, or to
* combine small shipments of materials from different origins.

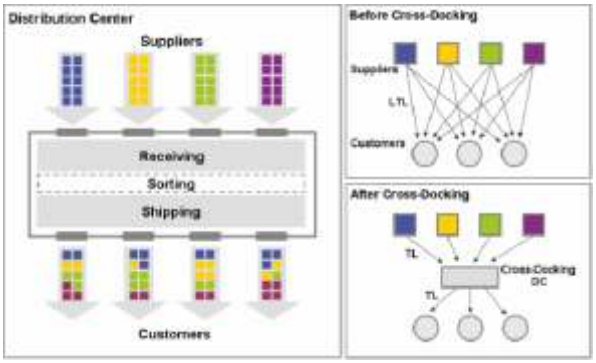
An Example of Cross-docking Distribution System: Wal-Mart

* Cross docking has been most successfully implemented in Wal-Mart's distribution system.
* Individual Wal-Mart stores transmit point-of-sale (POS) data from the cash register back to corporate headquarters several times a day.
* This provides instant feedback on customer demand, which is transmitted up the supply chain.
* Demand information is used to order shipments
  - From suppliers to the Wal-Mart distribution center and
  - From Wal-Mart distribution center to the store.

Products Suitable for Cross Docking

There are materials that are better suited to cross docking than others. The list below shows a number of types of material that are more suited to cross docking.

* Perishable items that require immediate shipment
* High quality items that do not require quality inspections during goods receipt
* Products that are pre-tagged (bar coded, RFID), pre-ticketed, and ready for sale to the customer
* Promotional items and items that are being launched
* Staple retail products with a constant demand or low demand variance
* Pre-picked, pre-packaged customer orders from another production plant or warehouse



Benefits

* Reduces material handling and no need for large warehouse
* Reduces need to store products in warehouse and products are moved quickly
* Reduced labor costs (no packaging and storing).
* Reduced time to reach customer.
* Transportation has fuller loads for each trip therefore a saving in transportation costs while also being more environmental friendly.
* High turnover of products with everything moving quickly through the cross docking terminal. Products usually spend less than 24 hours here.

Edited and Compiled by

S. Kumar – ***Jt. Secretary NIQR Chennai Branch***

General Manager – Operations, Bridgestone India Automotive Products

Toyota Production System For Lean Manufacturing

By ***K. Ravi.,*** *M.E., M.S.,*
AGM - Ashok Leyland Ltd, Chennai

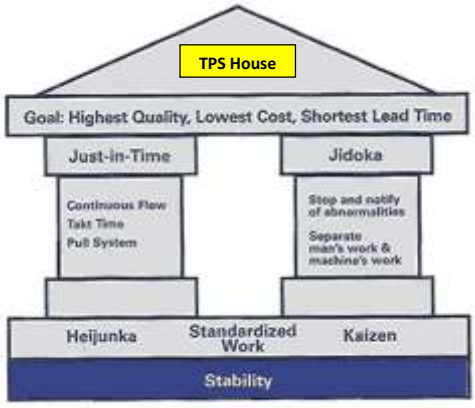
Abstract : Lean Manufacturing is the latest buzzword in manufacturing circles. It is changing businesses around the world through techniques that create outstanding results and translate directly into bottom-line profits. Lean manufacturing reduces Lead Time, Set-up Time, saves Turnover Expenses, increases Sales Growth, avoids Unnecessary Equipment Expenses, multiplies Inventory Turns & increases Profits.

Toyota Production System was invented by a production engineer Mr. Taiichi Ohno. This system enabled a paradigm shift in manufacturing from individual machines and their utilization, to the flow of the product through the entire process.

Keywords : Kanban, Kaizen, 5S, TPM, OEE, Pull system, SMED & Jidoka.

Introduction: Synonymous with Lean Manufacturing and Lean Production, the Toyota Production System is a manufacturing methodology developed over a 20 year period by Toyota of Japan. TPS emphasizes on two indispensible activities in all manufacturing viz., one by JIDOKA & the other JIT. The goal of TPS is to maximize profits by completely eliminating all wastes. *Profit =Price-Cost (Reduction /Cutting)*

1. Basic Concept of TPS



Toyota Production System "House"

Tools & Techniques to achieve TPS

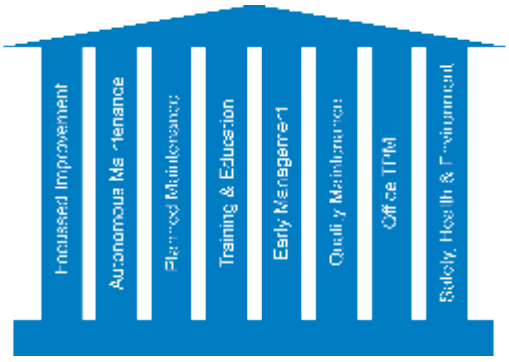
1. 5S (Methodology to improve work environment : Seiri ,Seiton, Seiso, Seiketsu & Shitsuke)
2. Wastes Enumerated by Taiichi Ohno
3. TPM (Total Productive Maintenance)
4. SMED (Single Minute Exchange of Dies)
5. Jidoka (Autonomation)
6. Standardized Work
7. Heijunka (Production smoothing)
8. Kanban
9. Pull System

TPS is comprised of two pillars, Just-in-Time and Jidoka.

2. Wastes Enumerated by Taiichi Ohno

Taiichi Ohno originally enumerated seven wastes (muda) and later added underutilized people as the eighth waste and misused resources as the ninth waste.

3) TPM : : It is a Productive Maintenance involving Total participation of all the employees from ***Managing Director to Mazdoor. Its aim is Zero defect, Zero Break down and Zero Accident***



Pillar 1: Focussed Improvement > Increasing Production, Productivity & Cost Reduction through 5S: Seiri (Sort), Seiton (Systemize), Seiso (Sweep), Seiketsu (Standardize) & Shitsuke (Self-Discipline).

Pillar 2: Jishu Hozen >Eliminating the defects at source through active employee participation. My machine concept (complete ownership of machine maintenance)

Pillar 3: Planned Maintenance > It is aimed to have trouble free machines and equipment producing defect free products for total customer satisfaction through Preventive and corrective maintenance.

Pillar 4 : Training & Education > It is aimed to have multi skilled employees whose morale is high and who have eager to come to work and perform all required functions effectively and independently.

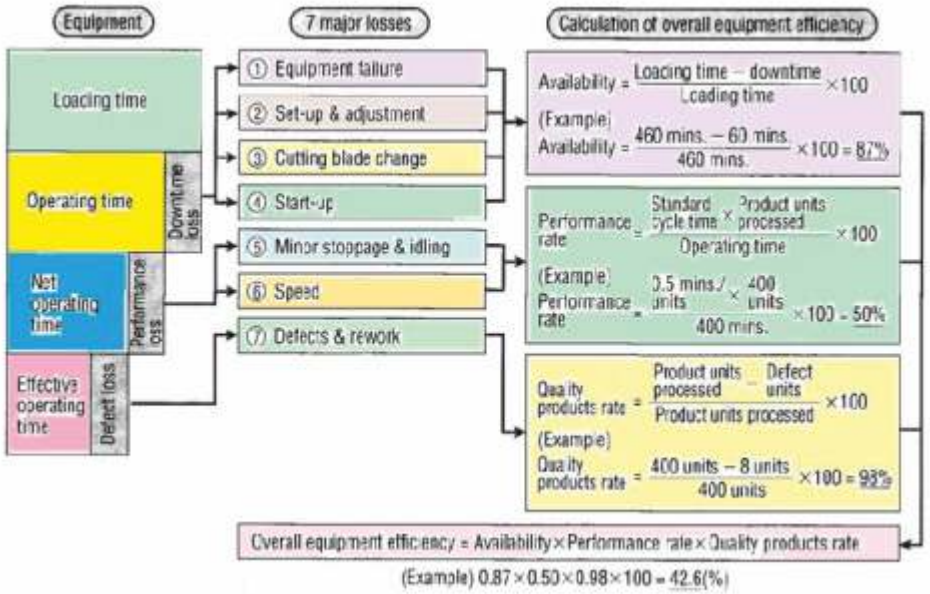
Pillar 5 : Early Management > Development of machines & Parts in lesser time and less cost

Pillar 6 : Quality Maintenance > QM activity is to set equipment conditions that preclude quality defects, based on the basic concept of maintaining perfect equipment to maintain perfect quality of products. Focus on poka-yoke.

Pillar 7 : Office TPM > Involvement of all people in support functions for focusing on better plant performance by reducing administration cost and utilizing the office space effectively.

Pillar 8 : Safety, Health and Environment > It helps to create a safe workplace and a surrounding area that is not damaged by our processes or procedures. It plays an active role in each of the other pillars on a regular basis.

Kobetsu kaizen >> OEE Calculation



4. SMED:

Aim is to reduce setup and changeover time. Activity can be divided into internal (possible only when machine is not in operation & External (can be done outside when machine is in operation).

Three Stages of SMED Application:

* Separate the External and Internal Changeover activities
* Convert Internal activities to External activities
* Streamline the Internal and External Activities

5. Jidoka:

Stopping a line automatically when a defective part is detected. Any necessary improvements can then be made by directing attention to the stopped equipment and the worker who stopped the operation. The Jidoka system puts faith in the worker as a thinker and allows the workers the right to stop the line when they find an abnormality. Thus, Jidoka leads to Man/Machine Separation, which is the basis for Standardized Work.

6. Standardized Work (Man machine Balancing)

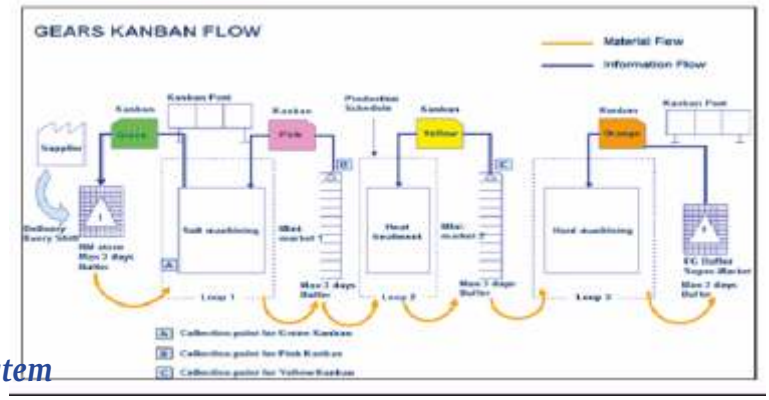
Three elements are: 1. Takt time (Available time / customer demand rate), 2.work sequence, 3. Standard in process stock

7. Heijunka: :

A method of leveling production, usually at the final assembly line, that makes just-in-time production possible. It involves averaging both the volume and sequence of different model types on a mixed model production line. Using this method avoids excessive batching of different types of product and volume fluctuations in the same product.

8. Kanban:

It is a scheduling system for lean manufacturing and just-in-time manufacturing. Kanban is an inventory-control system to control the supply chain. Taiichi Ohno, developed Kanban to improve manufacturing efficiency.



Example for Kanban Flow (Gear Shop):

9. PULL System (Super market or Grocery shopping concept) – JIT system

Produce Necessary items at the necessary time in necessary quantities.

Conclusion: Beyond manufacturing, TPS can also be followed for logistics and distribution, services, retail, healthcare, construction, maintenance, and everywhere. Indeed, lean consciousness and methods are only beginning to take root among senior managers and leaders in all sectors today.

References : Quality Planning - book by J. M. Juran, Lean manufacturing- seminar by Shineyu ltd

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10th & 11th June 2016

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