

2024年度

デミング賞
受賞報告講演要旨

Tata Ficoso Automotive Systems Private Limited

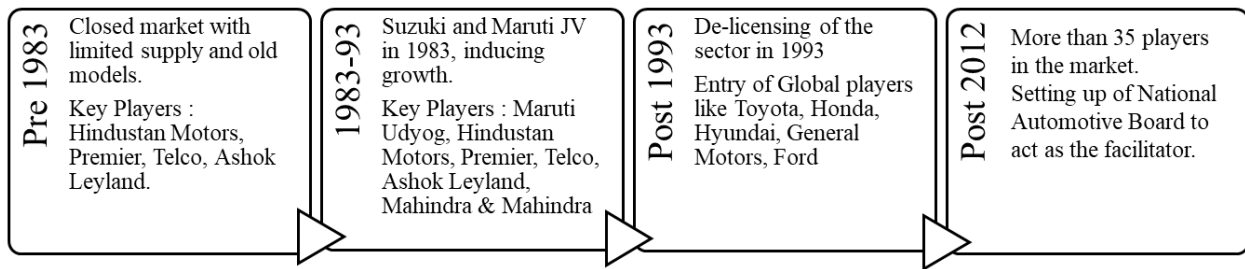
DTQMP Abstract: TATA FICOSA AUTOMOTIVE SYSTEMS PRIVATE LIMITED

1 Organization Profile

1.1 Background

Automobile Business Environment in India

The automotive industry is a pillar of the Indian economy and a key driver of macroeconomic growth and technological advancement. In India, the automotive industry contributes 7.1% to the total Gross Domestic Product (GDP) and provides employment to about 32 million people, directly and indirectly. The evolution of Indian auto sector is captured as below. Refer Figure 1.1



(Figure 1.1: Indian Automobile Business Scenario with Timeline)

TATA AUTOCOMP Systems Ltd.

TATA AUTOCOMP Systems Limited was established in 1995 with the objective to support the supply of components to TATA Motors Limited (TML), which had ventured in the Passenger Vehicle (PV) segment with the launch of Indica car. The objective also was to spear-head the development of the auto-component supplier base in India. Subsequently with the de-licensing of auto sector, and entry of global players in the Indian market, TATA AUTOCOMP expanded its customer base to cater to Automotive OEM’s across the various segments. Presently, TATA AUTOCOMP serves almost all major Global OEMs across all verticals of the Auto industry as well as Railways and Airways.

Joint Venture (JV) Partner - FICOSA INTERNATIONAL

FICOSA INTERNATIONAL, Spain is a leading global supplier founded in 1949 for research, development, manufacturing, and marketing of advanced technology, vision, safety, connectivity, and efficiency systems for the mobility sectors. In addition, FICOSA develops, manufactures, and markets cameras for the automotive industry.

TATA FICOSA

TATA FICOSA (TF) Automotive Systems Private Limited, is a 50:50 joint venture between TATA AUTOCOMP Systems and FICOSA International Spain. TF offers auto component products across a wide customer base with end-to-end solutions for Design & Development, Prototyping, Validation, Tooling, Manufacturing and Assembly, providing the latest products and technologies to meet the emerging trends in the Auto industry. TF is majorly present in Passenger Vehicle (PV) business and expanding footprints in Commercial Vehicle (CV) and other segments.

The purpose of the Joint Venture Company (JVC) to design, develop and manufacture in India and sell FICOSA and other ancillary products for the customers in India and abroad. The robust partnership is the building block of TF

1.2 TATA FICOSA Products, Customers and Plants

Products

The Product portfolio of TF includes Outer/Inner Rear-View Mirrors (ORVM/IRVM), Parking Brake Lever (PBL/PKB), Gear Shifter Assemblies, Washer System (WS), and Rear View Camera (RVC).

Customers

TF’s Customers include TATA Motors, SKODA-Volkswagen, Renault-Nissan, Stellantis, Mahindra, Ford, Ashok Leyland and Daimler, serving across PV, CV and 3-Wheeler segments. The Company also exports IRVM to Ford globally, and PBL to Renault and Stellantis Brazil. TF’s products are all safety products.

Product	Rear View Mirror (ORVM and IRVM)	Parking Brake	Gear Shifter	Washer System	Rear View Camera
Manufacturing Facility Available at Plant	Pune, Chennai, Sanand, Pantnagar	Pune, Chennai, Sanand, Pantnagar	Pune, Chennai, Sanand, Pantnagar	Pune, Chennai, Sanand, Pantnagar	Pune

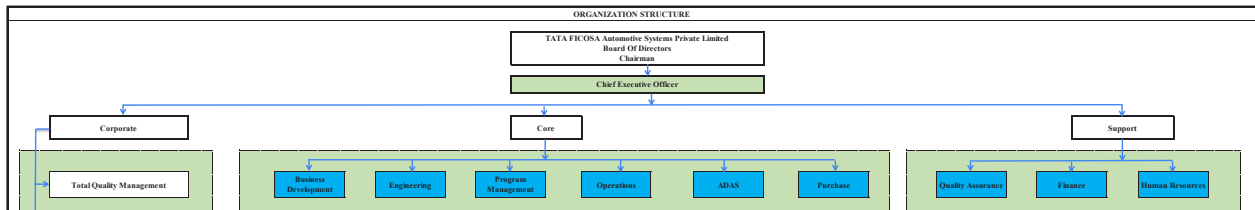
(Figure 1.2: TF Plant wise Products)

Plants

TF has four Plants, located in India at Pune, Pantnagar, Chennai and Sanand. All the plants are in proximity to the Customer and meet the Customer Specific Requirements. The assembly lines include product families of Rear-View Mirrors Inner and Outer, Parking brake levers and Shifters, all of which are equipped with automated End of Line (EOL) Testing machines. Engineering is standalone and capable of independently developing all conventional products and continually provides new technology and continuous value addition.

1.3 Organization structure

TF Organization structure is shown on the following page. TF is headed by CEO who in turn reports to the Board of Directors of the JV, headed by a Chairman. Board of Directors are having representatives from both TATA AUTOCOMP and FICOSA.



(Figure 1.3: TF Organization Chart)

The roles of the respective functions are as in below Table.

(Table 1.4: Roles of the function)

Department	Roles of the Department
Business Development	(1) Seeking new business opportunities (2) Building, and sustaining strategic partnerships with Customers (3) Improve sales, revenues, new product offerings, customer service and promoting brand awareness to boost the profitability and to increase market share.
Engineering	(1) Right Product at Right Time, within acceptable cost, Safety (2) compliance and target reliability and product testing. (3) New Product design (4) Technology Products Planning and Technology adoption. (5) Driving improvement projects for Existing products Quality & part cost. (6) Driving projects for Value Added features and product to Existing & New Customers.
	(1) To be an Interface and Single Point of Contact

1.4 Competition and Position

Each of TF products have different competition such as Messrs. SMR, Krishna Ishizaki (Mirror), Anu Auto, Prabha Auto, PMP (Washer System), Dura Auto, SL Corporation (Parking Brake Lever), Lumax /Hi-Lex and Venus (Gear Shifter Assembly). The market positions with respect to share of Business and market share in each of the product families is steadily increasing as depicted below.

1.5 Certifications

The various Quality Qualifications and Certifications gained by TF over the years for meeting highest customers standards and qualification requirements are as follows:

(Table 1.5: Quality Qualifications & Certifications)

Sr. No.	Category	Quality Qualifications & Certifications	Year
1	Customer	China Compulsory Product Certification (CCC) -for Ford & VW IRVM exports	2021
2	Customer	Stellantis – NSA	2021
3	EMS	ISO 14001 & ISO 45001 (IMS)	2020
4	Customer	Renault Nissan; ASES (Alliance Suppliers Evaluation System)	2020
5	Customer	TATA Motors; MSA (Manufacturing Site Assessment)	2017
6	Customer	Skoda Auto Volkswagen India Pvt Ltd; Formel Q	2014
7	QMS	IATF 16949	2013
8	Customer	Ford; Ford Q1	2006

1.6 Rewards & Recognitions

The rewards and recognitions are an indicator of engagement of the workforce, alignment to stringent processes, adherence to Quality standards and a barometer of customer satisfaction. Participation in various forum give an opportunity to develop their skills and imbibe learnings/ best practices from industry as well as displaying their engagement. TF has Reward & Recognitions from customers and other bodies like ACMA, CII etc. are as follows as highlighted in Table 1.6

(Table 1.6: TF Reward and Recognition)

Sr. No.	External Reward & Recognitions	Rewarded Year
1	Award from Customer- Innovation & Technology Excellence Award at TML Annual Supplier Conference	Sep-24
2	Award from Customer- TML in Q-Quest Kaizen Competition in Application Category- Pune Plant.	Jan-24
3	Won Silver Award in Kaizen Competition in QCFI- Pantnagar Plant	Jan-24
4	Won the "Meritorious" Award in Problem Solving in ISQ TOPS Convention- Chennai Plant	Jan-24
5	CII National Champions of Champion kaizen Competition- The Champion , Jury Champion and Star Champion .- Pune Plant	Dec-23

1.7 Corporate Social Responsibilities (CSR)

TF strives to make a positive impact on the Society & Community through CSR activities to improve the quality of life of the people in the communities we serve through long term stakeholder value creation through CSR projects under skill development and water sanitation and hygiene amongst others.

1.8 Environment Social Governance (ESG)

TF has pursued sustainable growth alongside our stakeholders, including shareholders, employees, customers, partner companies, and local communities, with a new mid- to long-term ESG strategy. This has been aligned to TATA Group guidelines to be Net Zero by 2040 for PV and 2045 for CV. TF is targeting to be Scope1/2 Net Zero by 2026 and 100% Renewable Energy by 2027.

2 Business Goals and Strategies

2.1 Background

TF commenced its business operations since 1998. TF manufactures the products for PV, CV, and 3-Wheeler segment. TF decided on the Mid Term Plan's (MTP) as below.

- **Pre-TQM Era: FY 2015-16 to FY 2017-18.**
- **TQM Initiation Phase: FY 2018-19 to FY 20-21 - MTP1**
- **TQM Establishment Phase: FY 2021-22 to 2023-24 – MTP2**
- **TQM Consolidation Phase FY 2024-25 to 2026-27 MTP3**

2.2 Pre TQM-Periods

In Pre TQM Era-Business objectives and strategies were driven through the Balanced Score Card system (BSC). Along with long-term aspirational targets the BSC card system was used to measure the performance against the Targets. During this period, TF was focusing on PV segment predominantly and was majorly into Built to Print (BTP). With no value add, the margins were less, fetched less price and limited our profitability. On the product quality front, the customer rejection was 47 PPM against the target of <35 PPM.

Key Focus Area to achieve the Vision.

Company decided to focus on following areas in-line with company vision by using 'Vision and Leadership Drive People to Sweat for Quality' (VLSQ) strategy. The following are Key Focus areas: -

- Growth
- Customer Quality
- Profitability

Need of TQM:

TF needed to bring focus on growth and profitability aiming for diversified customer portfolio, new product development and providing of value-added services to the customers. Simultaneously bring focus into acquiring and consolidating Customers based on meeting the highest quality standards as well as reduced customer rejections. TF embarked on TQM journey in FY19 to overcome these very challenges of Growth, Customer quality and Profitability.

2.3 TQM Initiation Phase: FY 2018-19 to FY 20-21 - MTP1

In FY19, TF realized that to grow business in a systematic manner, consolidating quality along with addition of new customer base was necessary. As a first step towards TQM implementation, the first Policy Management Cycle was implemented in FY 19 and we made our TF Vision in 2019. The strategic directions were defined based on the last three-year trends, Global trends, PESTEL, SWOT, Customer future requirements and understanding Stakeholder needs. Organizational capabilities and capacity requirements were defined. Growth, Customer Quality, and profitability was placed at the center of all. Having defined the Vision, the Mission brought in the focus on quality and, Objectives were formulated.

Company Vision

“By 2026, TF will be amongst Top 5 companies in India in its Product areas, exceeding customer expectations.”

Mission

Deliver value to all stakeholders by Differentiation through Safety, Quality and Constant Innovation.

Results of the objectives at the end of MTP1

Business Objectives of FY 19 to FY 21: The Mid Term Plan Key Focus areas and Targets for MTP period were finalized. This was deployed through Annual Business Plan using Policy Management. The Business Objectives Plan Vs Actual during FY 19 to FY 21 with FSM analysis is as below.

(Table 2.1: MTP1 Business Objectives and Strategies)

MANAGING POINT	UOM	FY 2017-18 (Pre- TQM)	FY 2018-19	FY 2019-20	FY 2020-21	FY 2020-21
		Actual	Actual	Actual	Target	Actual
Customer Rejection	PPM	47	27	54	25	34

Four Student Model analysis was based only on results. We achieved the growth at a CAGR of X%. However, to achieve our vision, we needed to grow at a CAGR of more than 2X%.

Remaining Challenges of MTP1

- Reduce Customer Rejection less than 10 PPM.
- Achieve Growth more than X% CAGR.
- Improve Profitability by Improving EBITDA%.

Learnings

During Policy management deployment, the Organization started preparing the objectives, but the understanding of management expectations was lacking namely in areas such as: -

- Quantifiable Strategy.
- Linkage between objective and strategy was not aligned.
- Limited understanding on policy management and TQM.
- TF defined only objectives with targets much like MBO (Management by Objectives)
- FSM was based on the KPI results for the objectives.
- Collaborative approach for objectives/strategy development was absent.
- The strategy to cascade objectives to below N-1 hierarchical level was inadequate.

2.4 TQM Establishment Phase: FY22 to FY24 – MTP2

TF revisited the vision at the start of MTP2. The start of MTP2 period was on the back of COVID-19 pandemic with the business badly affected and a drop in the profitability. There was a high attrition rate of workforce across the entire supply chain, leading to pressure on quality delivery. With this backdrop, TATA FICOSA had to re-visit its vision and business objectives. Customer engagement was strengthened and footfall to current and prospective customers was enhanced supported by enlarged team to better capture the Voice of Customer (VOC) and proactive identification of Customer requirements. TF accordingly also started offering new age technology and value-added features to customers.

The import from China was negatively impacted by Covid-19 and affected on the supply chain. To overcome this situation, we started localization as a strategy to become less China dependent and more cost competitive, in addition, looked at other geographies as import substitute.

To overcome the challenges of the Covid-19 era the Company re-looked the vision and objectives whilst retaining the mission. The focus was also to propel the growth and recoup the business lost due to pandemic and keeping in mind Customer Quality requirements and Profitability.

Company Vision

“By 2027, TATA FICOSA will be amongst Top 2 companies in India in its Product areas, exceeding customer expectations.”

Mission

“Deliver value to all Stakeholders by Differentiation through Safety, Quality and Constant Innovation”.

Objectives

In line with the Vision “to be amongst Top 2 companies in India”, the following objectives were formulated.

1. Rs XXXX Crore company by 2027, Top 2 players in our business -For Organization Growth and Competitive edge.
2. Enhance Customer satisfaction in Quality by reduction in Customer PPM < 10 ; Delivery by maintaining stock levels as per customer requirement- To enhance Customer Satisfaction.
3. EBITDA: % and PBT: % - To be a Profitable Organization and Business Continuity.

Learnings

- After Implementation of catch ball session, the discussion was open to new ideas implementation and helped to get better understanding of practicality of the business plans.
- Establish DWM inputs based on the PM KPIs and DWM KPIs the entire team, spanning from N-1 to N-2 level across all plants.
- Total Employee Involvement (TEI) increased by implementing the TEI framework and TQM promotion.

Effect - TF Revenue Growth

TF Growth rate has doubled in MTP2 compared to MTP 1. In MTP1, CAGR was X% where as in MTP2 CAGR was 2X%.

Remaining Challenges of MTP2

Remaining Problems of MTP2 - Improve Customer Ratings, Reduce Customer Rejection, increase new Order Booking, Enhance PBT and to overcome challenges as below,

- (a) Backward Integration by Competitors
- (b) No Presence in potential customer
- (c) Demand for Future Technology
- (d) Growth in Passenger vehicle volumes.
- (e) Maintain Zero accident.

2.5 Business Objectives of FY 25 to FY 27- MTP3:

At the start of MTP3, based on remaining problems and future business, the Organization relooked the Objectives and Strategies. Customer Satisfaction has continued to remain as the core objective of the organization. The company objectives and their targets for MTP3 are identified and depicted in Table 2.2.

(Table 2.2: Business Objective and Strategies for MTP3)

Key Focus Area	Objective	Key Performance Measures	UOM	Strategy	Key Performance Measures
Customer Quality	Customer Rejection	Customer PPM	PPM	Launch Rejection	Launch Rejection (SOP+3months)
				Reduce Internal rejection	Internal PPM
Growth	Net Sales	Sales	Rs. In Cr.	Sales from Existing Products	Sale
Profitability	Maintain EBITDA	EBIDTA	%	Reduction in Material cost	Material Cost
				Reduction in conversion cost	Conversion Cost
	Zero Fatality	Incidences	Nos	To Improve Tata Safety Health Management System Rating	Tata Safety Health Management System Rating
	Environment Social Governance	ESG Score	% Score	Achieve ESG Score	Score
	Zero Accident	Reportable Accident	Nos	No Major Non-conf	

3. TQM Promotion

3.1 Background and Need of TQM

To realize TATA FICOSA’s vision namely, “By 2027, TATA FICOSA will be amongst Top 2 companies in India in its Product areas, exceeding customer expectations”, the focus is on growth and profitability, with the goal of diversifying customer portfolio, developing new products, and offering value-added services to customers. Simultaneously, TF focuses on adding and consolidating customers while maintaining the highest quality standards and reducing customers rejections.

3.2 TQM Journey at TATA FICOSA

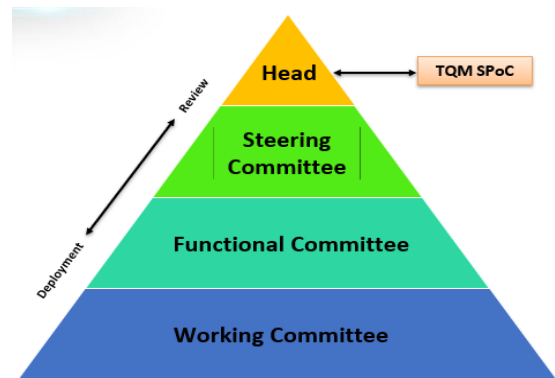
TF embarked on TQM journey in FY19 to overcome these very challenges of Growth, Customer quality and Profitability. TATA FICOSA implemented TQM in three phases. TATA FICOSA has prepared a detailed “TQM Promotion Plan” for each phase with its deliverables is as below Table 3.1

(Table 3.1: TQM Promotion plan with Deliverables)

TQM Phases	Key Focus Area	TQM Initiatives
Pre TQM -Phase (FY16-FY18)	To reduce customer rejection To Improve the productivity Improve safety.	1) Customer Satisfaction score achieved 85%. 2) Improved Built in Quality by implementation of Poka-yoke. 3) Productivity Improvement by eliminating MUDA, MURA and MURI. 4) BSC Star rating Improved from 3 Star to 4 Star. Achieved zero reportable accident.
Introduction Phase (FY19-FY21) MTP1	Establishment of TQM Practices, Business Growth, Quality Improvement and Customer Satisfaction.	1) Formation of TQM Promotion office and Steering and Functional Committee. 2) Setting of Vision and Mission. 3) DWM in Manufacturing areas (Operations and Quality) 4) Introduction of Policy Management, Quality Flag System. 5) Introduction of QAM and VE. Basics Training on 5S, Safety and TQM.
Establishment Phase (FY22-FY24) MTP2	Strengthening of TQM and Business Growth through New Technology Products. Reducing Customer Rejection.	1) Strengthening of Policy Management and Daily Work Management. 2) Introduction of Daily Management of Framework. 3) Increased Employee Involvement By introducing TEI Framework. 4) Introduction of New Product Development System.
Consolidation Phase (FY 25 to 27) MTP3	Digitization, Internal Capability building, Effectiveness evaluation mechanism, Focus on CFM, Task achieving QC story, TEI for contractual and associates	1) Digitization of DWM and Policy Management KPI 2) Training to all levels of Problem solving 3) Improving Cost Management by focusing Cross Functional Management 4) Digital Tracking for all TEI Activities.

3.3 TQM Promotion Organization

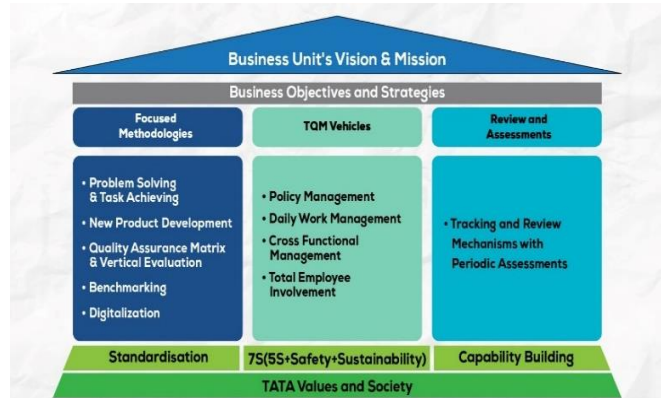
The TQM organization structure was established in FY19 at TATA FICOSA organization level and it has three levels consisting of TQM SPoC, Steering committee and Functional committee with their pre- defined roles and responsibilities (as described in Figure 3.2). The Committee performance and progress of TQM implementation is being reviewed periodically as per plan.



(Figure 3.2: TQM Organization Structure)

3.4 TQM Framework

TATA Core values are the foundation and 5S, Safety, Sustainability are at the base of TQM framework. It consists of the 3 pillars, Focused Methodologies, TQM vehicles and Review & Assessment. These are built on a strong base of TATA Values and Society, Standardization, 7S (5S+Safety+Sustainability), and Capability building. TQM Framework achieves business objectives and strategies. TATA FICOSA’s Vision and Mission are the apex of the Framework. There is periodic review mechanism of Policy Management at CEO Level. DWM Review at Function level. Monitoring/review of TEI through Dashboard is in place.



(Figure 3.4: TATA FICOSA’s TQM Framework)

TATA has always been a values-driven organisation. These values continue to direct the growth and business of Tata companies. The five core TATA values underpinning the way we do business are- Integrity, Responsibility, Excellence, Pioneering, Unity.

3.5 Policy Management

Pre TQM Era

During Pre - TQM era, TF used the Balanced Scorecard (BSC) methodology to monitor business and departmental goals. The primary TF objective revolved around overseeing a limited set of metrics, with a particular emphasis was on financial targets and inadequate focus on customer and quality. Tasks were approached in a more reactive manner rather than through structured processes. This approach proved to be rigid, predominantly result-oriented, and lacked a process-driven orientation.

TQM Initiation phase MTP1

In FY19, TF’s first Vision and Mission was rolled out. The MTP was developed in alignment with the BU vision and mission taking into consideration the changes in external environment, customer expectations in the future and unresolved issues from the previous plan period. Taking these inputs SWOT analysis was done to determine key areas for improvement. Based on the outcome of the MTP the annual plan of TATA FICOSA BU was developed at the CEO level. Thereafter the annual plan was deployed to the subsequent levels using catch ball approach across various functions and deployed at various levels. These policies are implemented using appropriate projects at relevant levels. Performance is periodically monitored in terms of objectives and strategies and in case of deviation feedback is given for corrective and preventive action(s). FY19 onwards TATA FICOSA started following FSM approach to determine effectiveness of policy management. The key benefits are establishment of customer driven and challenging targets with appropriate objectives and strategies resulting in achievement of the targets.

Learnings

1. TF did not identify the strategies to achieve business objectives.
2. The FSM student type was identified, looking at the performance of objectives.
3. The understanding of people about the MPCP’s was limited.
4. The differentiation between Policy Management (PM) KPIs and DWM KPIs was not captured.
5. The feedback of employee to be captured effectively.

TQM Establishing phase MTP2

During TQM Establishment phase, the learning from last MTP1 were captured. TF continued the good practices and further strengthened areas like PESTEL, SWOT analysis, competition analysis. To improve the PM cycle following actions were taken.

1. Started identifying more than one strategy to company objectives.
2. Four Student Model analysis done by looking at combined effect of performance of objectives and its strategy.
3. Separate Monitoring started for PM and DWM KPI.
4. Organization introduced the catch- ball session for feedback purpose. This helped to create the organization expectation amongst the employees.

Learnings

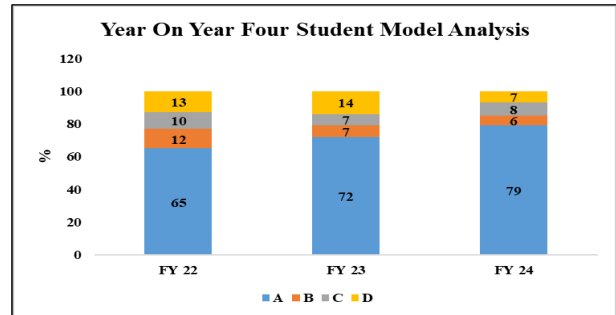
During Policy management deployment cycle organization started preparing the MPCP’s but most employees could not understand the expectations from the management. Hence Organization introduced the catch- ball session for alignment and for setting up SMART targets.

Benefits

After Implementation of catch ball session, the discussion was open to new idea implementation and helped to get better understanding of the business plans.

Effect of Policy Management

The effectiveness of Policy Management on annual basis is depicted at Figure 3.5. It clearly shows the incremental increase in policy items of in ‘Student Type A’, year on year. This shows improvement in effectiveness of Policy Management Process.



(Figure 3.5: Four Student Model Evaluation)

3.6 Daily Work Management (DWM)

DWM helps managing the routine jobs at all levels effectively and efficiently, with intent to sustain and improve the present level of performance. Daily Work Management aims to maintain the status of all the daily operations so that the targets of each worksite can be achieved by rotating S-D-C-A cycle.

TQM Initiation Phase- MTP1

Initially the DWM was implemented mainly on the shop floor and subsequently it was extended to support functions. Effectiveness of DWM is measured in terms of number of stable process/ reduced abnormalities and standards revised/created each year.

Learnings:

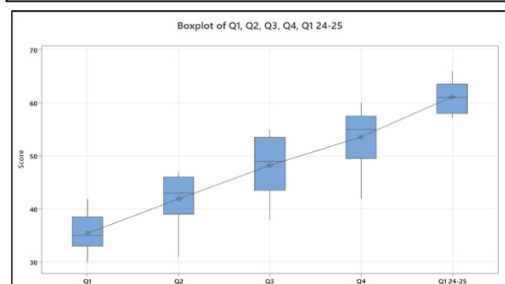
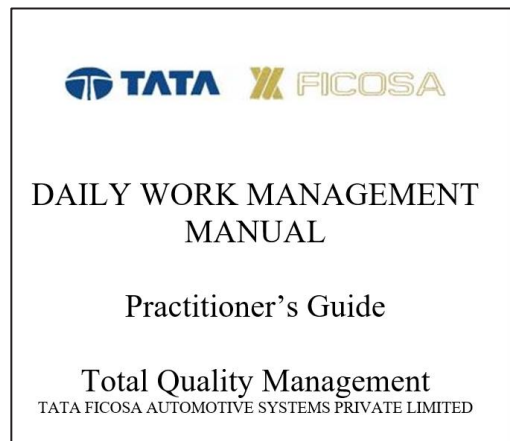
1. PM and DWM KPI was mixed in MPCP sheet.
2. The expectation of next process was not getting addressed.

TQM Establishment Phase

During MTP2 Period, we adopted the DWM framework. We started preparing ‘DWM Deck’ as a separate document. This gives a clear understanding of PM and DWM KPI. In the below framework we started defining Define the level of service you expect from an internal customer.

To implement the DWM at various levels following steps are being followed.

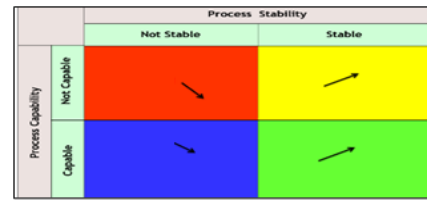
1. Clarity and KPI’s in Role, responsibility.
2. KPI’s from SLA- Service level agreement.
3. KPI’s from MSC- Management System Chart
4. KPI’s from Operational / Functional requirements (Departmental procedures / control plan, IATF /ISO/ IMS/BSC/TOPS etc. procedures)
5. Listing and monitoring of DWM KPI’s
6. Process control – Control chart, Process capability.
7. Abnormality, analysis, and corrective actions
8. Training on new or revised standards
9. Continuing SDCA
10. DWM effectiveness



(Figure 3.6: DWM manual and maturity Assessment)

Effects of DWM:

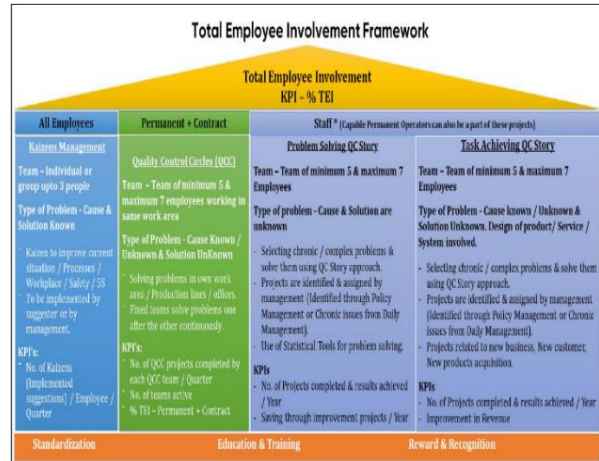
Effectiveness of DWM is measured in terms of number of stable process/ reduced abnormalities and standards revised/created each year. To visualize the process performance and DWM Effectiveness, 2x2 matrix on process stability and process capability is carried out. The KPI's which are monitored through control charts should be classified in above mentioned 2x2 matrix as shown in Figure 3.7



(Figure 3.7: Stability vs. Capability- Example)

3.7 Total Employee Involvement: Development and Active Utilization of Human Resource and Organizational Capability through Total Employee Involvement.

The first big challenge for leadership team was to create an initiative that could connect the entire population of employees at grass root level and bind them through a common objective. This was also highlighted during the TQM diagnosis. With this background a “Total Employee Involvement (TEI) framework” was generated. As depicted in Figure 3.8. TEI involves all employees Permanent and Contract, and Staff across all plants. % TEI score is generated for all permanent and staff based on their KPIs.



(Figure 3.8: TEI Framework)

Background and Purpose:

TQM implementation and fostering an engaged workforce through Total Employee Involvement serves as a purposeful strategy to enhance motivation, enthusiasm, and engagement among employees while retaining organizational skills to meet challenging customer demands.

The TEI initiatives are based on below mentioned activities:

Suggestion: The objective of suggestion method is to create a culture where all employees are motivated to contribute their improvement ideas within the jurisdiction of business unit. Any suggestion which is beneficial to the company is considered. It is not limited to improvement in production, quality, or safety. When an employee implements the suggestion or becomes a part of team who implemented the suggestion, considered as involved in TEI & this implemented suggestion is promoted to kaizen category.

(Table 3.9: Suggestion Committee structure)

Department	Position	Committee Role & Responsibility
Operations	Head Operations	Evaluation of suggestions as “accepted or not accepted” on monthly basis.
Quality Assurance	Head Quality Assurance	
Human Resource	Head Human Resource	
Manufacturing Engineering	Head Manufacturing Engineering	Allocate responsibility to departments for implementation of accepted suggestions.

Kaizen: Improvement is done on existing facilities where both root-cause, as well as solution are known. These improvements are either implemented by the suggester or by the management.

QC Circles & Quality Circle Project: QC Circle is a group consisting of minimum 5 to maximum 7 front-line employees working in the same work area come together to solve problems in their respective areas using problem-solving methodologies. The team structure of a quality circle is permanent in nature. The team can choose their improvement project from their respective problem bank in their respective area. Such projects done by quality circles are classified as Quality Circle Projects.

Problem Solving QC Story: The activities to fill the gap between the current level and the intended target level are by maintaining the framework of the existing system. Problem solving method is analysis focused. The philosophy is to analyse the past data and identify factors responsible for the problem and further take action on those factors hence solving and controlling the problem.

Task Achieving QC Story: The activities to achieve the intended target levels by establishing a new system or by breaking through the existing framework and creating a new framework. Task achieving methodology is to design new systems by exploring various design alternatives, selecting of best design alternative, implementing the best alternative, and developing standard operating procedures (SOPs)

Measures & KPIs:

Suggestions Collected in a Month:

- Measure: Total number of suggestions submitted by employees within a month.
- KPI: Average number of suggestions collected per employee per year.

Kaizens Received and Implemented:

- Measure: Total number of Kaizens received per person per year.
- KPI: Percentage of Kaizens implemented out of those received.



Quality Control Circle Projects:

- Measure: Number of QC Circle projects completed by each QCC Team per quarter.
- KPI: Percentage of TEI in QC Circles (Direct category)

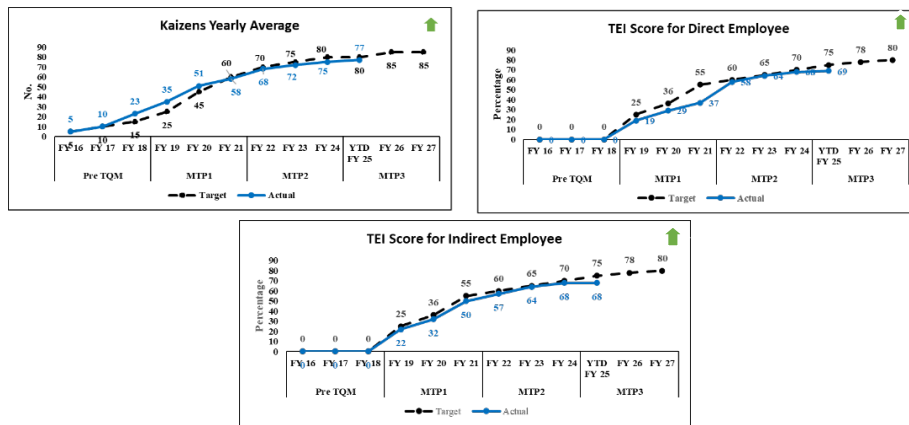
Problem Solving and Task achieving QC Story:

- Measure: Number of Projects completed by Indirect category, and results achieved per year.
- KPI: Savings through improvement projects per year.



These initiatives are actively executed to foster a culture of engagement, skill development, and a positive work environment within TATA FICOSA. Performance metrics and feedback mechanisms are utilized to evaluate the effectiveness of these initiatives in enhancing employee involvement and satisfaction.

Target Vs Actual



(Figure 3.10: Target Vs Actual TEI Trends)

Total Employee Involvement is an extensive strategy encompassing a range of initiatives focused on engagement, recognition, skill development, and employee well-being. This holistic approach aimed to create a motivated and skilled workforce capable of meeting customer demands while fostering a positive and inclusive organizational culture. TATA FICOSA's approach of continuous improvement practices have brought in positive changes and the workplace better.

3.8 Cross Functional Management (CFM)

The objectives of the Cross Functional Management (CFM) is to ensure all staff team members participate to achieve Company Goals and involve in continuous improvement journey. CFM have very widespread and covers most of the staff categories employees right from BU head (chairperson of CFM), all functional heads, plant heads to engineer or officer level. Figure 3.11 shows the example of CFM. Currently Four Cross Functional Management (CFM) Committees are formed at TATA FICOSA Chakan Plant. Rows are CFM and Columns are the functions involved in Cross functional team. Each CF team is led by CFM lead as per scope of the committee. Further to this each cross functional committee lead some key improvement projects.

Department Committee	Operation	QA	Purchase	Engineering	Finance	HR
Safety	CFM Lead					
Quality Assurance		CFM Lead				
Cost Management					CFM Lead	
New Product Development				CFM Lead		
	Strongly Related			Related		

(Figure 3.11 Cross Functional Committee and Relation with Functions)

Digitization - Information Technology (IT)

TATA FICOSA is one of the early adopters of SAP S4 HANA system, which acts as a “Digital Core” for digitization journey. As the company is expanding its footprint in domestic as well as global market, IT function is gearing up to ensure standardized, simplified & integrated business processes enablement using various IT systems, secured IT environment & seamless communication and exchange of information.

TATA FICOSA has also adopted the digitization drive internally and identified projects for digitization implementation.

3.9 Capability Building - People, Products, Processes

To meet our Vision aspiration and to be ready for future, TATA FICOSA has developed a structured process of capability building for people, processes, technology, infrastructure, and suppliers.

(Table 3.12: Capability Building initiatives and their outcomes)

Capability Building	Initiatives	Outcomes
Process Capability	1. Knowledge on process received during trainings at Turkey, Spain and Morocco deployed in product assembly lines. 2. Proactive quality approach QC Circle Projects.	1. CPPM improvement from 303 to 7 2. Overall Line Efficiency (OLE) improvement from 73% (FY 18) to 86% (FY 24)
Infrastructure Capability	1. Manufacturing Plants vicinity to Customers. 2. In house R&D with various testing facilities. 3. Expansion of existing Manufacturing facility at Chakan.	1. Reduction in FG Inventory at customer and as well as in house. 2. Reduction in Scope 3 emissions. 3. Testing Outsourcing expenses reduced. 4. Enhanced employment and employability
Technology Capability	Lightweight materials, EV light weight components, Supplies of Electronics automotive component.	Supplies of PKB. Supplies of Rear View Camera to TML.
Supplier Capability	1. Strengthening of supplier audit 2. VAVE workshops with suppliers TQM 3. Training of suppliers	10-point commandments for supplier Improvement, Supplier audits,

4. Practice of Challenging Strategies

4.1 Achieve Revenue Growth by expanding Customer base, Product & Value Proposition

Background: The PV market in Indian and globally has been evolving over years with disruption of technology being at the forefront. Also, as per Market study Indian automotive market is expected to be one of the fastest growing markets globally. PV volumes are expected to touch 4.9 Mn units by FY27. Automotive industry in India contributes close to 7~10% of GDP.

In line with the strong outlook of Indian automotive market, Government Policies also supports for industry growth.

TF has predominant business presence in PV segment. TF is one of the prominent supplier in ORVM, IRVM, PBL, and Manual Gear Shifter & WS in India.

MTP1 Era: FY19 to FY21

Changing business dynamics and to achieve desired Revenue Growth, TF revisited its internal NPD processes. Detailed analysis of our system, processes, connected with Customers and partners highlighted the need to start ‘working on FSS projects’ where design & development is responsibility of supplier. To achieve targeted growth, it was imperative to scale up our Products offerings and Engineering services and take upon projects from Conceptualization phase to Industrialization phase.

Learnings:

- Decline observed in revenue & order booking due to Impact of COVID-19
- No new projects kicked off by OEM Embedded products.

Activities by applying TQM Methodology:

Identifying and Securing New Business: TF followed Strategic Business Planning (SBP) approach to determined focused markets and products.

Engineering:

Technology Road Map of MTP1: At the start of MTP1, TF created a technology roadmap. With this ‘Per Car value’ of ORVM increased from INR X (Pre-TQM) to INR 4X (MTP1)

Pivotal Engineering Activities

- Optimization in Design & Development (D&D) costs.
- Testing Lab Enhancement
- Early Engagement with Customers for the new programs.
- Modular design offerings.
- Use of FICOSA library child parts.
- Product Bench marking with competition and Partner.

Taking care of Stated and un-stated needs of customer and offer value added features during following years. Figure 4.1 shows journey of TF showing how Engineering Capabilities are upscaled. During MTP1 phase we developed as a majorly FSS organization in all products. New products such as VGA Camera also added as FSS with Partner Support.

Tata Ficoso Products offerings and its Development Status MTP-1 Phase							
Customer	Products						
	Exterior Mirror	VGA Camera	Manual Shifter	Front View Mirror	Parking Brake Lever	Washer System	Interior Mirror
Product Value (High to Low) →							
Tata Motors PV				N/A			
Skoda-VW				N/A			#
Renault Nissan				N/A			
Tata Motors CV							
Ford				N/A	#		#
Mahindra				N/A			
Stellantis							

(Figure 4.1: Upscaling Engineering Strengths in MTP1)

Business Development: TF formulated the Business strategy roadmap with proactive marketing strategies as:

a) Sustain (which focuses on existing Customer): As a part of the Strategic Business Planning (SBP) process, TF approaches its existing customers with above feature packed products. Technical proposals further fine-tuned, based on customer feedback, followed by formal RFQ. TF and competitors submit Techno commercial proposals followed by iterative process, wherein multiple options are evaluated by Customer, business is awarded for proposals that meet desired target levels.

b) Grow (Acquiring New Customer): As a part of the SBP process, TF does Market, Product analysis & Market Share resulting prospective customers and products in the unserved market. Customer in sighting is done to understand their pain points and techno commercial solutions are offered leveraging existing product portfolio. Based on the above analysis TF identified potential customers and prioritized them for Phase 1.

MTP2 : FY22 – FY24:

As a learning from MTP1, TF continued to explore emerging technology trends in Indian market. In line with End customer requirements, there was a major demand of Value-added features including highest safety, comfort, feel factors and connected cars.

Major TQM Activities: Voice of Customer: Capturing Voice of its customers TF started taking higher challenges for Technology Building & Deployments. TF periodically review and update Technology Roadmap.

Engineering: TQM tools were deployed including MSC, QFD, VOC and DFMEA, which supported building as FSS and propel our Growth. Complete Value chain was analyzed and updated through improvements in MSC including product conceptualization, Pre-development, Pre-sales, RFQ generation, Business Nomination and sales realization.

Pivotal Engineering Activities

- Capability enhancement for Products, Features addition & Virtual Simulation.
- On job trainings at Partner locations
- Stringent targets taken for Design to cost and deliver cost effective solutions.

PDCA Summary: The learning and abnormality out of the actions initiated during PDCA for each period. It further elaborates how Customer base and thereby Revenue growth achieved by applying TQM methodology during MTP1 and MTP2.

Effects:

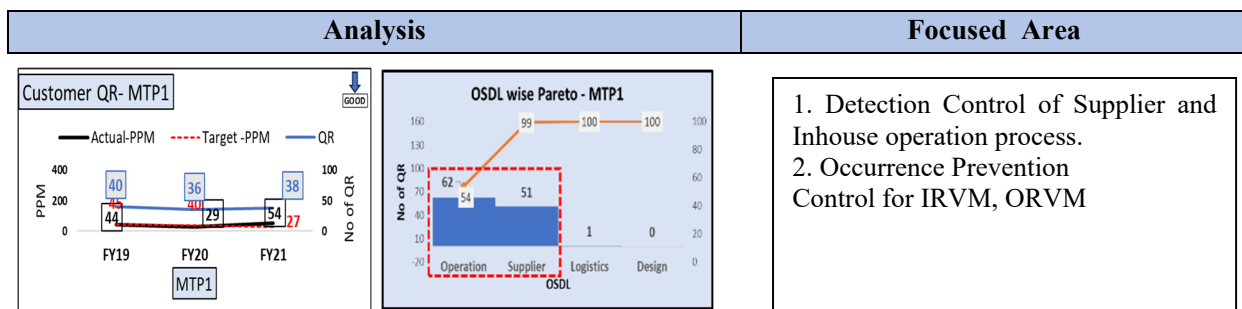
- Receipt of RFQ’s for upcoming models from Customers.
- Potential entry into new customers with technology products.
- Increase in revenue of Spares due to high value of above products.

4.2 Challenging Strategy - Reduce Rejection at Customer end, the Customer PPM and no. of Quality Rejection (QR).

In MTP1, the shift from manual control to the integration of detection Poka-yoke and prevention control Poka-yokes significantly impacted our operations.

Focused Activities:

MTP1:

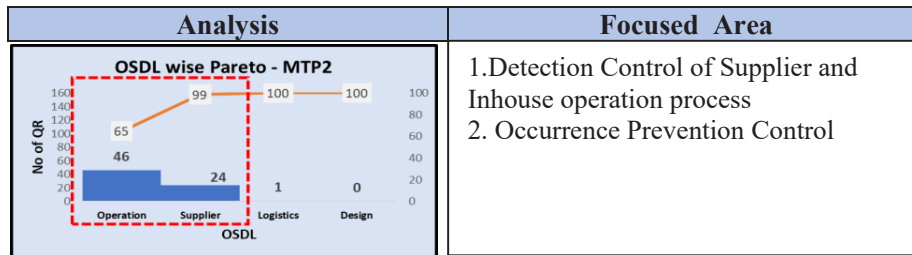


(Figure 4.3: Customer Rejection Trend during MTP1 Period)

Focused Activities: In MPT2, we underwent a substantial transformation to reduce customer PPM, to achieve customer delight. We used Vertical Evaluation and deployed prevention controls as appropriate.

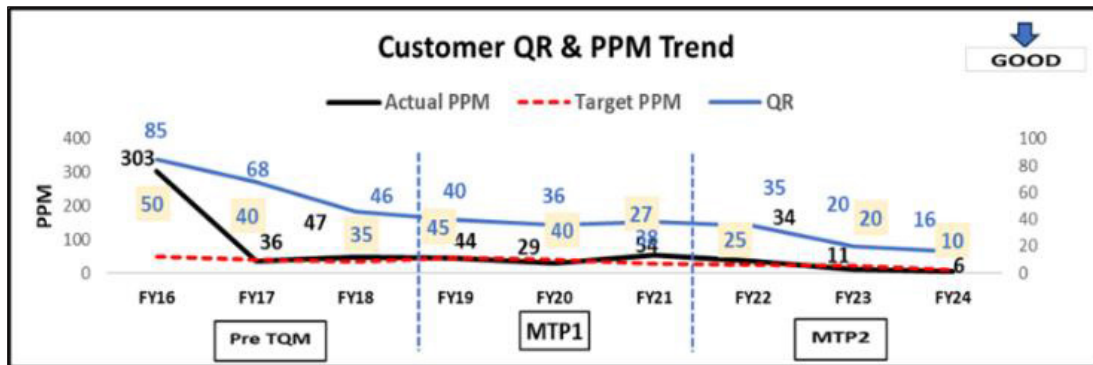
Phase	MTP1 (FY19 to FY 21)	MTP2 (FY22 to FY 24)
Objectives	The goal is to reduce customer PPM,	The goal is to reduce customer PPM,
Detection Control of Supplier and Inhouse operation process	-Identification of CTQ Stations & Parameters. -Poka-yoke Implementation for detection & Prevention under the following categories. L1-Manual Inspection L2-Pokayoke for detection L3 – Poka-yoke for Occurrence Prevention	-Strengthen focus on IRVM - Vertical Evaluation of customer PPM issues followed by detection & prevention. -Enhanced training & awareness about attribute type defects and SOP for handling of parts - Digitization for traceability of part
Occurrence Prevention Control	-Migration from detection to Occurrence Prevention - Focus to convert L1 & L2 control to L3 category	- Ensuring Stability & Capability by SPC studies -Strengthened focus on maximisation of L3 type control.
Effect	Customer PPM – 4X PPM	PPM – X PPM
Remaining Problems	-Attribute type of PPM Issues (Scratches, dent, etc. need to be address in process) - SPC to be strengthened -	-Interface aesthetic issue i.e., shade variation. -Implementation of Cameras, Sensors, for defect prevention at occurrence. -Quality Matrix deployment on stations

MTP2:



(Figure 4.4: Trends of Customer Rejection During MTP2)

Effect: Result in MTP2 is highly satisfying with Customer PPM reaching to single digit for the first time. The no. of QR also significantly reduced ensuring no repetition of issues at Customer end.



(Figure 4.5: Customer Rejection Trend)

4.3 Cost Management

TATA FICOSA (TF) rigorously implements the objective of cost management through EBITDA improvement projects at company level. This cost management objective (EBITDA) is reviewed at the organizational level involving multiple functions with detailed cost analysis of Raw Material Cost, Direct Expenses, Indirect Expenses

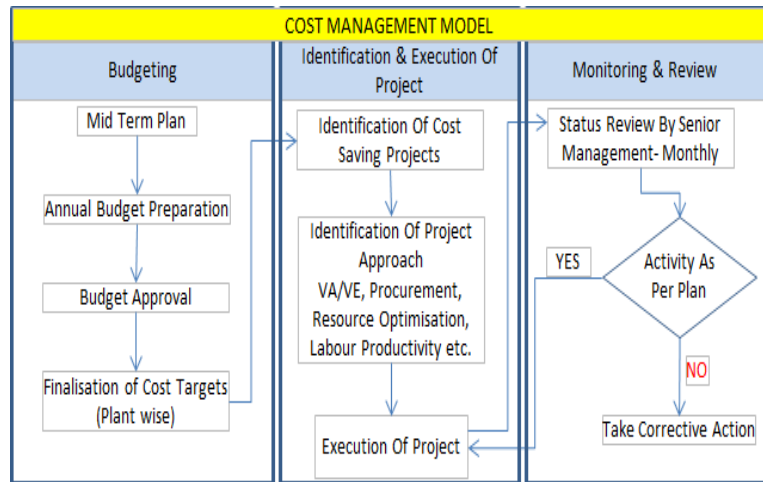
The combined effect of cost management is displayed as EBITDA achievement which is compiled, monitored, and reviewed through identification and listing of various cost reductions and control activities in the form of Bain model.

The important and high potential areas of cost reductions are identified by employing various techniques like Pareto analysis, bench marking, ABC classification, spend analysis, VSM, Make or Buy classification.

MTP2 (FY22 to FY24)

In the MTP1 the systematic approached activities are taken for cost management and improvement in delivery of material and Quality from vendors. In continuation to continuous improvement further focused strategies are taken for cost management objectives.

Optimization of Costs through cost breakdown analysis, benchmarking with the competitive pricing standards, detailed analysis of supplier’s process, identifying the improvement opportunities. CFT Formation is carried out lead by the subject matter experts to Generate ideas, Evaluate the potential, Action implementation to achieve desired results and monitor the sustainability of the results achieved. The cost Management Model: Figure 4.6 is established.



(Figure 4.6: Cost Management Model)

Strategy & Focused Activities

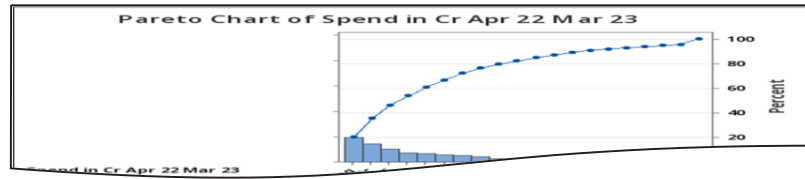
Phase	MTP2 FY22-24
Objectives	Enhance financial performance for sustainable growth.
Focus activities	Consolidation of RM requirement Localization. Strategic Partnerships.
Effects	RM price reduction Delivery performance Improved Quality Localization
Remaining issues	Local Development of Critical parts.

Key Cost Contributors:

TATA FICOSA uses a variety of material. To focus on cost reduction projects, the cost contributors are identified, and cost reduction projects identified.

Prioritization of Key Cost Contributors:

The commodity wise spend for FY22 -23 is Pareto analyses to focus on the major spending commodity. Multilevel Pareto tool used for Project Selection by prioritization of cost contributors in above.



(Figure 4.7: Material cost Analysis Commodity wise)

Typical Moulding part cost break up analysis: We analyse the part cost to fullest extent of each category. Example, RM cost, Process cost, Special process costs eg heat treatment, painting, powder coating etc, packaging, Transport cost, Rejections ICC for local and imports Raw material, profit and overheads. Below are the details of working which we have done.

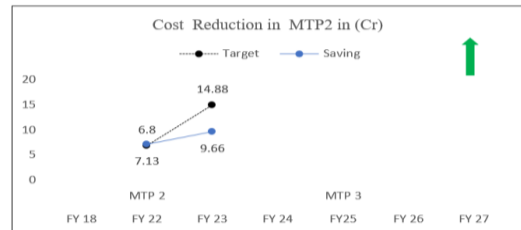
2023-24 Cost saving Ideas.

We have done the cost contributor analysis and Based on the above Below are the methods / levers we have identified and implemented in the year 2023-24, Cost management and reduction initiatives are evaluated based on,

- Usage of 12 levers of cost reduction methods (Negotiations, volume discount, Costing norms Reduction, Payment terms, VAVE, Resourcing, Localization, tooling cost saving, Weight Reduction, YOY Price Reduction, Indirect material cost reduction, Process optimization)
- 360 reviews of the costs.
- Tool manufacturing localisation
- RM Tie up with the manufacturers.
- Manufacturing process optimization (moulding, stamping, casting)
- Use of nesting software for blank optimization for sheet metal.

Learnings form MTP2:

- During MTP2 activity it is observed very high amount of data and information related to costing is generated in various areas of cost management. There is a need of Digitization and Analytics of data.
- Development of Electronics part locally.
- More focus on supplier capacity considering the increase in volumes.

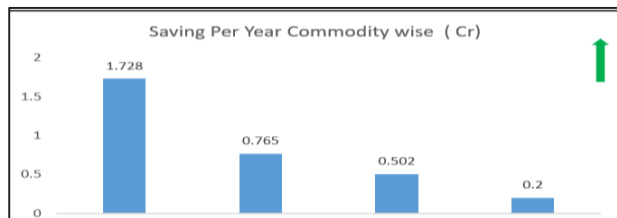


(Figure 4.8: Cost Reduction in MTP2)

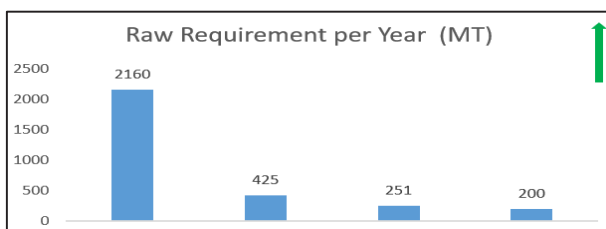
Result:

Due to focused effort on raw material sources consolidation and long terms contract with manufacturers the following benefits achieved,

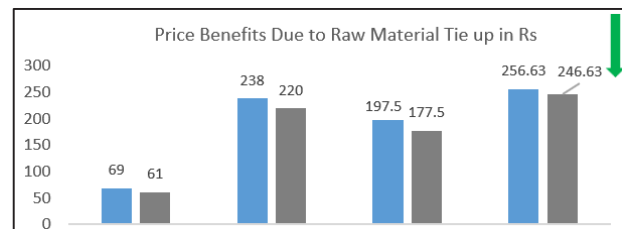
- Availability of raw material in time.
- Pricing consistency through indexation.
- Consistent quality (One lot distributed to TF moulders)
- Cost saving due to Raw Material Tie-up.
- Customer satisfaction
- Strong support to EBITDA



(Figure 4.9: Cost saving in RM Commodity)



(Figure 4.10: Raw Material Availability)



(Figure 4.11: RM Tie up rate Vs Market Rate)

MTP 3: Focused Activity

Implementation of rate amendment

- Purchasing dashboard.
- Should be costing software.
- SAP ERP development for child part weight measurement and control.

• **Competent Vendor Base Development**

- Support for improvement in supplier capability. (Utkarsh initiatives & Kaushal training program)
- Contingency planning for future volumes.

Other Direct Expenses

Power Cost Saving through energy saving initiatives.

WHY Selection of Power Cost:

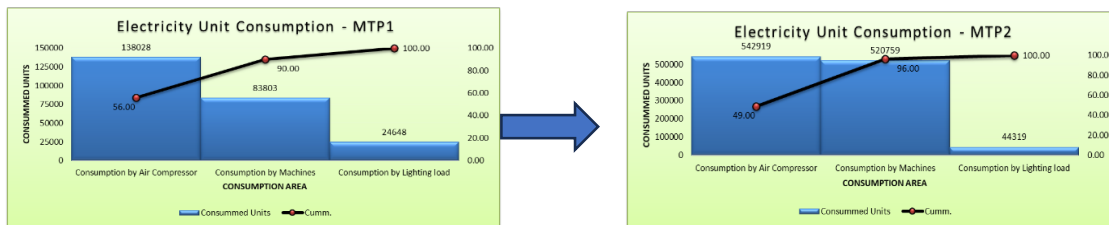
Pareto Diagram is shown for direct expenses for FY19. It is evident in this pareto that the top contributor for direct expense cost is the Direct labour cost, followed by Packing, logistic and Power cost and so on. The reason why we picked up Power cost for the cost saving is because of the huge potential for savings in this area. Subsequently, we had plan for improving the direct labour cost through productivity improvement projects. Whereas Packing and Logistics cost is mostly driven and decided by our customers.

MTP2: Team were regularly practising DWM, and data generation activities continued with use of trend charts, pie charts, Pareto diagram and analysing every abnormality and working out solutions implementation. These initiatives started showing some results. Use of energy efficient equipment’s initiated.

As we observed high target setting for power cost, in past and could sense more potential of savings in energy cost with the use of solar energy and other energy saving projects, so, the targets were revised.

Enhance solar unit generation, Installation of separate water tank for cleaning of solar panels.

- **Change of Industrial wall mounting fan to HVLS**
- **Change from Direct motor air compressor to VFD (Variable frequency drive) Air compressor:** We had total 3 Nos. of direct motor compressors. With increased in load, all these three compressors were running at 75-85% loading, which resulted in high power consumption.



We decided to add one new compressor with VFD, which will only run as per demand, hence consuming less power. (Calculations can be shown on demand)

Results Achieved: Power & Fuel cost target brought down from 0.68% to 0.23% of net sales and achieved.

5. Practice of Base Building Strategies

5.1 Overall Line Efficiency (OLE) Improvement

Background

OLE Improvement was one of our Strategy. Our focus, in this direction was to have foolproof processes, elimination of waste, and improvement of overall efficiency of our assembly lines.

Pre TQM & MTP1 period, TATA FICOSA was a cost driven organization which focused on reducing the operational cost and maintaining the leanest possible cost structure as our KPI had the focus on operational cost optimization as per BU BSC targets. In this phase, we were monitoring Labour efficiency, which were mainly centred around the people on shop and had limited focus on other key parameters responsible for performance and machine availability. The focus on OLE was very limited in this phase.

MTP 2 Period (FY 22- 24): (TQM Establishment Phase)

[We switched from labor efficiency to OLE monitoring in this phase.]

In the beginning of MTP 2 period, we conducted a comprehensive analysis of the existing assembly line processes. The focus shifted from solely cost-saving measures to a broader emphasis on Operational Excellence through OLE improvement. This transition reflects a strategic shift towards sustainable long-term improvements in operational

performance. Identification of areas prone to inefficiencies, NVA & defects, and analysis of it serves as the foundation for targeted improvements in **OLE by improving Performance, Availability & Quality**. So, we have decided to focus on the below objectives for productivity improvement.

- Waste, NVA (Non-Value Added) elimination in the process.
- Line Balancing.
- Rejection reduction.
- Improvement in supply chain.
- Availability improvement.

To improve line performance, we done elemental cycle time study for each process & assembly line, identified the scope of improvement through line balancing & waste elimination.

Below is such one case study of improvement of OLE through line balancing, Waste reduction & improving machine availability.

A) Performance Improvement at Altroz ORVM (Customer car model) assembly Line

At Tata Ficosa, we mainly have Assembly lines to manufacture our products like ORVM (Outer rear-view mirror), GSL (Gear shift lever), Gear Shifter Cable, Parking brake lever, Washer system & IRVM (Inner rear-view mirror). At one of our ORVM assembly line for Altroz (Tata Motors Car model), we observed low output in a shift than the required rate (To meet customers requirement). This situation also Led us to run the 3rd shift to fulfil customers daily requirement.

Our Team had taken up this assembly line for study to understand the NVA & others wastes to improve the shift output. Please find below the detailed exercise: -

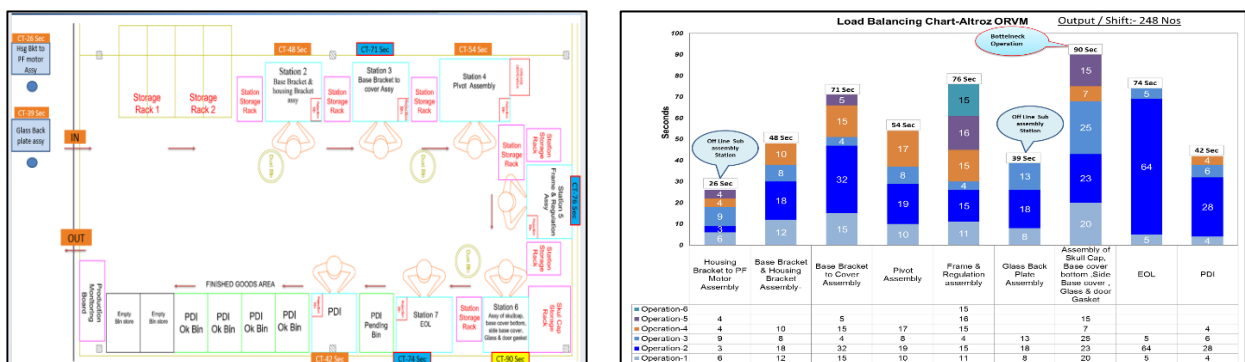
Data Gathering

- The customer daily requirement was 640 nos. ORVM. (with takt time of 72 sec on 2 shift basis)
- The line capacity was 330 nos. ORVM per shift.
- The actual per shift output was 248 nos. ORVM.

We had to run 3rd shifts to meet the customer daily requirement.

Gemba Observations: We studied the line layout of Altroz Line with workload on its each station (Please refer Figure 5.1) with following observations:-

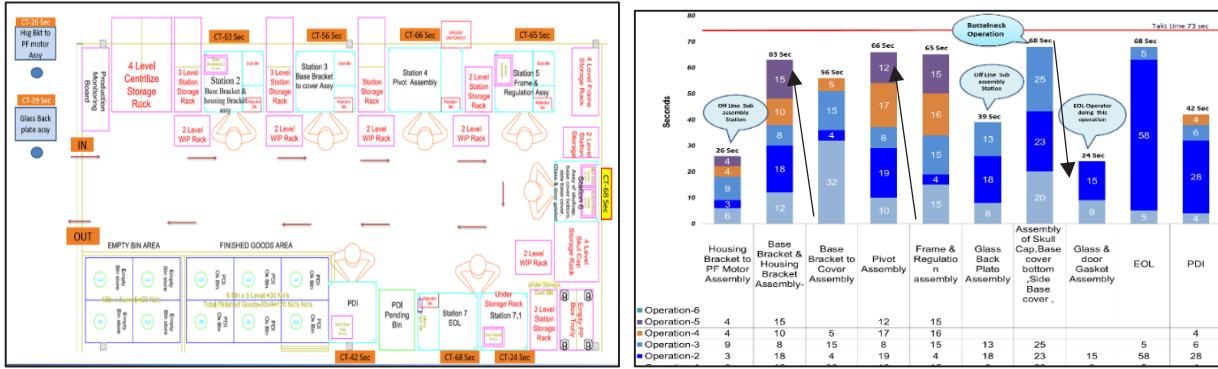
1. Station no 7 is bottleneck having 90 sec cycle time which is more than projected takt time of 72 sec.
2. The cycle time of three stations (station 5, 7 & 8) is more than takt time. Which is 76, 90 & 74 sec respectively.
3. The cycle time of station no 3 is 71 sec which is close to takt time.
4. Station 2(cycle time 48 Sec) & 4 (Cycle time 54 Sec) are less loaded than the bottleneck operation (Stn. no 7).
5. Child part storage is outside of assembly line, making operator to move more to pickup parts after 2 hrs.
6. Repeated maintenance issue (down time on station 1 for sensor damage & on EOL for glass angle not ok.)



(Figure 5.1: Altroz ORVM Line Layout & Station wise cycle time, Before Improvement)

Idea Generation:

After Study we found that we can reduce cycle time of station 3 & 5 by shifting some workload to pervious station 2 & 4 respectively. Also, can reduce the station 7 Cycle time by addition of 1 manual workstation.



(Figure 5.2: Station wise cycle time, workload & Layout After Improvement)

Idea implementation:

After Study of Elemental cycle time at each station, we have decided to shift part of workload from high cycle time stations to low cycle time stations in order to balance the workload on each station.

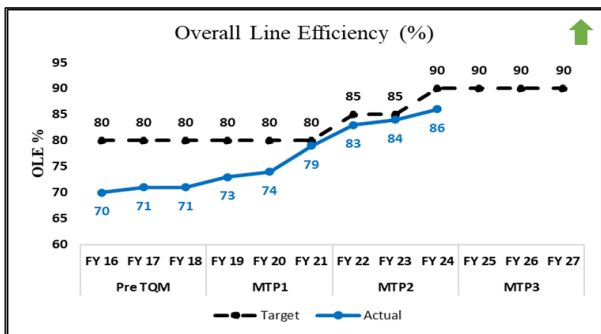
- The deco strip fitment of Station 3 is shifted to station 2 which reduces the cycle time of station 3 from 71 sec to 56 sec & increases cycle time of station 2 from 48 to 63.
- The frame fitment of station 5 is shifted to station 4 which reduces the cycle time of station 5 from 76 sec to 65 sec & increases cycle time of station 4 from 54 to 66.
- To reduce the workload of station 7, we provided 1 additional station in between station 7 & 8 end of line (EOL). [Gasket fitment & Glass assembly operation shifted on additional station from station 7]. Which reduces the cycle time of station 7 from 90 sec to 68 sec.
- The additional station was manned by EOL operator during its auto cycle (no addition of manpower).
- Further, the auto cycle time of EOL was reduced from 64 sec to 58 sec by performing its two test simultaneously which earlier was done in series, which resulted in overall EOL cycle time reduction from 74 sec to 68 sec.
- Child part storage is provided on station or on side rack to reduce operators' movement.
- The repeated maintenance concerns were addressed (change of sensors of station 1 from inductive type to Photo sensor & at EOL LVDT mounting bracket design was changed from adjustable type to fixed type).

Outcome of ideas implementation.

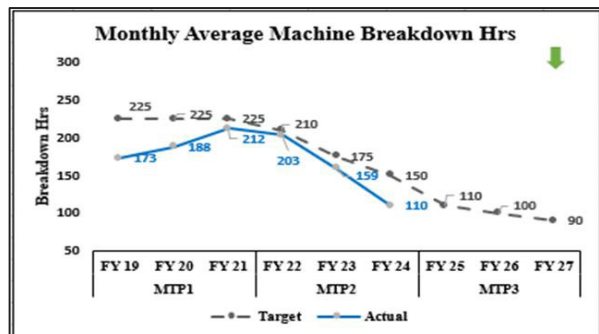
- Achieved targeted output 320 Nos ORVM per shift in same manpower.
- 3rd shift working was eliminated.
- The performance rate of Altroz ORVM line improved from 77.5% to 100%.

The horizontal deployment of the above actions has been done on other lines also. Which resulted in an improvement in overall plant OLE.

Results



(Figure 5.3: Overall Line Efficiency)



(Figure 5.4: Breakdown Hrs.)

5.2 Management of "Safety"

"Safety" is of paramount importance at Tata Ficosa. In line with our Mission "Deliver value to all stakeholders by Differentiation through Safety, Quality and Constant Innovation", Tata Ficosa commits to provide safe and healthy work environment by setting up safety standards and procedures for "Safety. As a part of its TQM initiative "Safety" was selected as one of the Base Building Strategies of Tata Ficosa with the objective to achieve injury free workplace by

(1) Incorporating safe design of machinery/ equipment and manufacturing process by adhering Management of change (MOC) Process

(2) Defining training process before on boarding and Inductions, Job specific training before deployment

(3) Implementation of Tata group level, Tata safety health management system (THSMS) which facilitates British mechanism of self-assessment and external assessment from other Tata group companies.

The TATA Safety health management system (TSHMS), Procedure was adopted in MTP-2 as a part of safety excellence journey to transform the safety culture of the organization from reactive to proactive approach by emphasizing on involvement of everyone in THSMS process.

Employee Involvement: On Daily and weekly basis, we have safety review with team, employee engagement in safety kaizen, training, toolbox talk, National safety week celebration various activities like Safety Quiz, Slogan, Poster, Safety suggestion competitions. Celebration of National Road Safety Day, World Environment Day. Various trainings on safety are imparted to identify the hazards, unsafe condition, unsafe act, near misses. Training also on safe operation of machines & safety systems. Formation of emergency response team, well trained fire fighters, first aiders and pallet stacker operators. Reward & recognition system as well Safety Consequence Management System to promote safe behaviour at workplace in view of the accident prevention.

Involving employees in the safety audit process to encourages a safety culture and provides valuable insights from those directly involved in day-to-day operations from all functions.

Proactive Approach: Proactive safety management focuses on how to adjust performance so that risky situations do not occur by implementing the TATA Health Safety management system, Leadership Walk, BU Safety walk and Internal Audit.

Periodic review of process to identify Hazard & risk assessment. Implementation of fire prevention, detection, and firefighting system. Incorporating machine safety requirements, safety poka-yoke at the design and installation phase itself and daily inspection of the machine safety controls by operator, safety poka-yoke. Daily safety toolbox talk at the shift start-up to employees. Thermal audits for electrical panels through thermography surveys

Safety Committee: is a group of individuals within an organization who collaboratively work to promote and enhance workplace safety. Here are short notes on Safety Committees: structure.

Safety Audit:

Safety audits are systematic evaluations conducted to assess and improve the effectiveness of an organization's safety management system. Here are some short notes on safety audits:

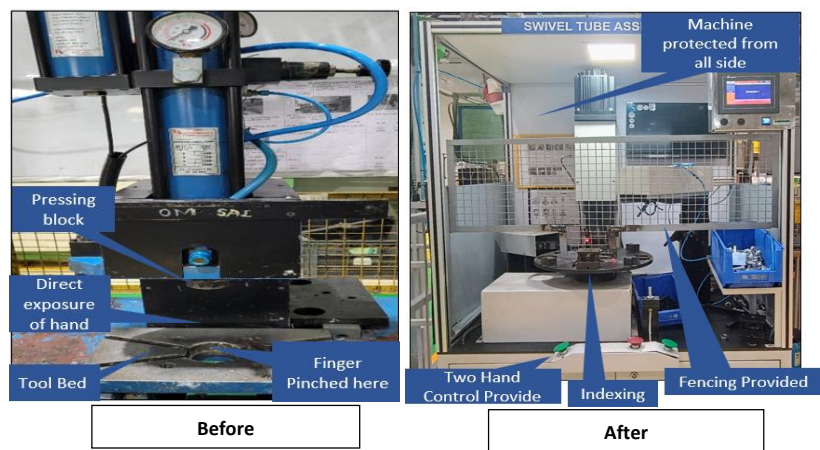
5.2.1 Machine Guarding Safety Example

Implementation Plan: Developing and implementing a machine guarding plan is crucial for ensuring workplace safety. Here's a step-by-step implementation plan follows:

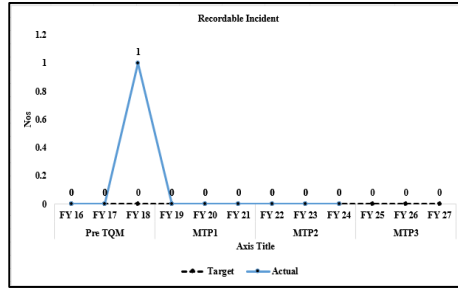
1. Initial Assessment, 2. Prioritization, 3. Phase wise Implementation Plan 4. Verification and Validation

5. Employee Training, 6. Audit and Review

We have prepared the implementation plan and as per plan we have implemented the Two hand control system, Machine guarding has been done, eliminated the direct exposure of hand to machine and provided the indexing, Awareness training given to all the operators for safe operation of the machine and HIRA register reviewed and updated.



Results: Post Implementation of machine guarding plan, there is drastic reduction in the incident and quantifiable Benefits like increased the productivity and reduced the incident



(Figure No 5.5: Incident Reduction)

- Two hand Safety switch with Simultaneous control & Safety Curtains (photo guard)-- L-600 mm min
- Roll forming tool 2set of TA side & 2 set of SS side (1set having 2 lower tools & 1 pressing tool)
- Hydraulic pressure upto 150 bar for this assembly
- Analog pressure indicator for hydraulic pressure
- Dampers /shock absorbers for machine & rotating or moving plate.
- Digital Pressure transducer for hydraulic pressure control.
- Error Indicators & Error acknowledgement.
- Quick Tool Change Over (SMED).
- HMI control with all operations manual / auto modes operable stage wise
- Part locating dies must be compatible for changeover (for future changes)
- Individual air pressure regulators to be used for each pneumatic cylinder on this station.
- Digital pressures switch with dual display for traction cylinder.
- **Assembly should withstand for extraction testing (80 KGF minimum)**

(Figure No 5.6: Technical data sheet.)

5.3 Practice of Base Building Strategies- HR

Strategy: Skill & Competency enhancement through Digital Training Modules in DOJO centre

TATA FICOSA has initiated a transformative journey in HR practices by introducing the "DOJO" training methodology, aiming to digitalize training processes. This initiative combines digital modules with interactive elements to address skill and competency gaps among employees across production lines. The primary objective is to enhance training levels and effectiveness through digitalization.

Prior to the implementation of Total Quality Management (TQM), TATA FICOSA faced challenges in meeting training Man-days and achieving planned skill level requirements. It was difficult to schedule classroom training for employees working unconventional shifts. Additionally considering the differentiated backgrounds / skills, structured approach could not cater to Skill requirements of various lines. Traditional training methods lacked self-directed learning opportunities, leading to inefficiencies and compromised training effectiveness.



(Figure 5.7: Classroom Trainings only with PPT slides)

During MTP 1, we enhanced our training centre by expanding its infrastructure. This expansion allowed us to prominently display all standard operating procedures (SOPs) and cross-sectional views of our products. These displays served as integral components of our classroom training sessions. In addition to these visual aids, we implemented training modules focused on TATA FICOSA's products and processes. However, despite these improvements, we encountered challenges in scheduling training sessions due to the varying availability of batches resulting from different shift schedules.



(Figure 5.8: Classroom Trainings with SOPs & Cut section displays)

5.3.3 TQM Establishment phase MTP 2:

In the TQM Establishment phase, TATA FICOSA's strategic focus shifted towards HR Digitization with the introduction of the "DOJO" training methodology. The strategy aimed to streamline training processes by integrating digital modules, videos, and interactive models tailored to employees' skill levels. On successful completion of the module on the Kiosk, Digital certificates of completion is provided.

TATA FICOSA continued enhancing, refining, and deploying digital training modules within the DOJO centre as exhibited in Figure 5.5. The focus remained on improving training effectiveness and ensuring employees qualified for required skill levels within designated timelines for all the lines.



(Figure 5.5: DOJO Centre with Digital Training Modules)

Learnings:

The deployment of digital training modules resulted in improved qualification and training effectiveness and availability for required skill levels. This ensured that more Multiskilling of workmen happened thereby contributed to a more versatile workforce, capable of handling various operational demands. The introduction of digitalized "DOJO" training modules marks a significant leap forward in HR digitization at TATA FICOSA. This initiative not only refines the training process but also empowers employees with a broader skill set, enhancing operational agility. To

ensure long-term success, ongoing monitoring, fine-tuning, and aligning with evolving industry needs are imperative.

5.4 Base building strategies – Management of “Sustainability”

TATA FICOSA commits to provide sustainable and environment friendly operations to achieve its growth targets. As a part of its TQM initiative “ESG” was selected as one of the Base Building Strategies of TATA FICOSA with an objective to minimize Green House Gas emissions by using Renewable Power and Greener fuel for its manufacturing processes. To achieve this, CFM approach was initiated with participation of Operations, R&D, Quality Assurance, and the Finance team.

TATA FICOSA to embrace sustainable practices and policies, primarily through the implementation of sustainable business practices and increased investments in green technology. Sustainability is ability to maintain or support a process over time and TATA FICOSA have committed to sustainable goals, such as reducing their environmental footprints and conserving resources.

In line with our ESG vision to become an ESG leader in the segment and create long-term value through implementing the best sustainability practices, we have carried out a materiality assessment to identify material issues/ focus areas in consultation with all Stakeholders and developed ESG targets.

In this journey, TATA FICOSA has also aligned with TATA’s Sustainability goals under Project Aalingana thereby committing 25% reduction in absolute CO₂e emissions (Scope 1+2) from 2020 baseline by 2030, and Net Zero emissions by 2045. In addition, we have considered additional goals related to Social & Corporate Governance. The KPIs are as enumerated below and has a robust tracking system in place.

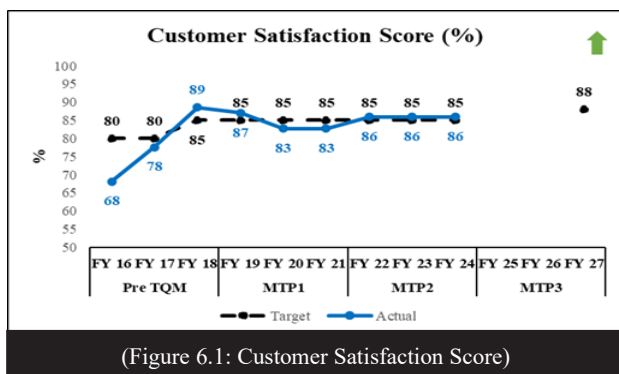
(Table 5.6: ESG Target Vs Base Line)

Alignment	Issue	KPI	Alignment with TATA Group	Criteria	Weightage	Alignment	Issue	KPI Aligned with TATA AutoComp	Criteria	Weightage	
Project Aalingana-Net Zero	GHG emissions	Scope 1 emission	2030: 25% reduction in Scope 1+2(vs 2020) 2045:Net-ZERO	10% reduction over FY 20	5	Social	Employee wellbeing	Lost Time Injury Frequency Rate	Zero	5	
		Scope 2 emission	2030: 25% reduction in Scope 1+2(vs 2020) 2045:Net-ZERO	5% reduction over FY 20	2.5			Employee satisfaction score %	> 75%	5	
		GHG intensity: Total carbon emissions /CO ₂ e sales (INR Cr.) (For Scope 1 & Scope 2 only)	2030: 25% reduction in Scope 1+2(vs 2020) 2045:Net-ZERO	10% reduction over FY 20	2.5			Average hours of training per year per employee	5 Mandays	2.5	
Project Aalingana-Net Zero	Energy management	Energy intensity (GJ sales (INR Cr.)	Industry Leading	5% reduction over FY 20	5		Workforce training and development	% of attrition of Hi-pot	< 10%	2.5	
		Share of renewable energy in the energy mix (%)	Industry Leading	>10% RE	5			% Diversity in total workforce	> 25%	5	
Project Aalingana-Circularity	Water management	Water consumption (Domestic) – Lit/person	Industry Leading	<30	5		Customer satisfaction	Customer satisfaction score	>75%	5	
		Water intensity – Kl/sales (INR Cr.)	2030: Water neutral , 2040: Water Positive	5% reduction over FY 20	5			Community relations	Ensure Zero Human Rights Violation YoY	Zero	5
Project Aalingana-Circularity	Waste management	% of wastewater discharged	2030: Water neutral , 2040: Water Positive	zero	5		Technological advancements in automotive industry		Ensure 100% Employees receive Human Rights, DEI training Annually	100%	2.5
		Waste recycling (%)	2025:2x recycled content (vs 2020) 2030: 0% waste-to landfill	zero	2.5			Sustainable supply chain	Engineering or R&D on sustainable products spend as a % of sales (INR Cr.)	Meeting the annual target	5
		Waste going to landfill (% of total waste)	Industry Leading	zero	2.5				% of Tier 1 suppliers assessed on sustainability parameters	Assess 100% Critical Suppliers on ESG Parameters	5
Project Aalingana-Circularity	Waste management	% of waste-to landfill	2025:2x recycled content (vs 2020) 2030: 0% waste-to landfill	100% recycling of recyclable parts	2.5	Corporate Governance	Business ethics	% employees receiving Code of conduct and ESG training	100%	2.5	
		% LCA conducted for critical products	Industry Leading	1 Critical product	2.5			Number of complaints/ breaches for data privacy	zero	1	
		% of sites that have biodiversity management plans (BMPs)	2030: NBS Leader	Group level target-1	2.5			TAT for resolving POSH complaints	60 days	2	
Project Aalingana-Biodiversity	Biodiversity	Number of biodiversity related non-compliances recorded	2030: NBS Leader	Zero	2.5		TAT for resolving Customer complaints	30 days	2		

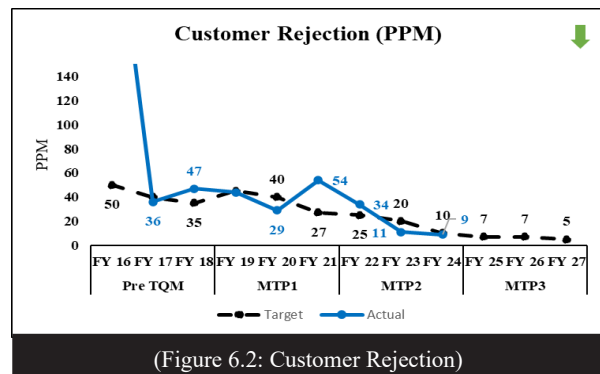
6. Effects of TQM

The idea of TQM initiation in TATA FICOSA is to help in meeting the business objectives effectively and progress towards its Vision. TQM has helped us in systematic introduction of Data based approach for achieving the goals. Note: Below results are estimated results for FY24.

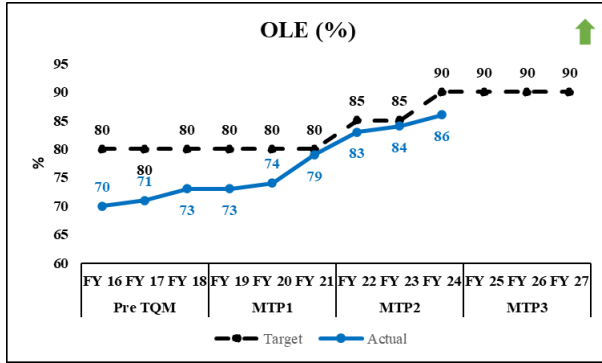
6.1 Tangible Effects (Sequence as per MTP2 KPI)



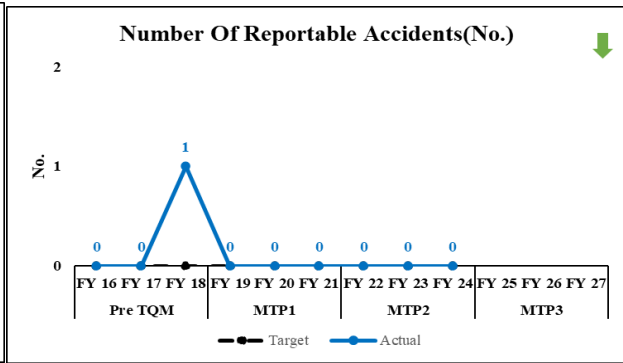
(Figure 6.1: Customer Satisfaction Score)



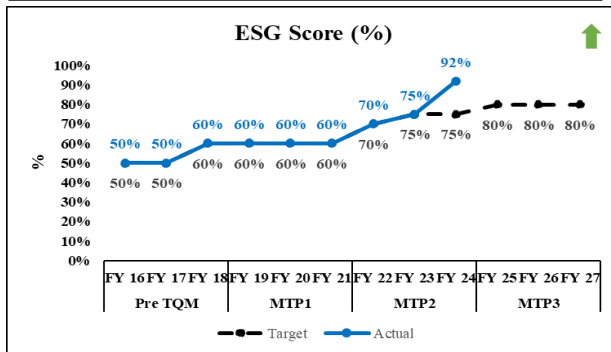
(Figure 6.2: Customer Rejection)



(Figure 6.3: Overall Line Efficiency)



(Figure 6.4: No. of Reportable Accidents)



(Figure 6.5: Sustainability Score)

6.2 Intangible Effects

- Learnings of Business Development through policy management.
- Customer (internal & external) focus increased in all processes.
- Improved Confidence levels to achieve targets, Cause and Effect relation,
- Understanding level, Problem solving ability, SPC analysis.
- Culture of standardization, Daily Work Management & PDCA improved.
- Above mentioned tangible benefits helped TF to won various rewards & recognitions.
- Increased monitoring level. Openness in problem / abnormality reporting. Communication Improved.
- Increased awareness on collecting product performance information from customer during RFQ discussions.

7.1 Future Plan:

TQM has placed TATA FICOSA on the right path to achieve its Vision which is

“By 2027, TATA FICOSA will be amongst Top 2 companies in India in its Product areas, exceeding customer expectations.” Improving **Customer Experience** through **Competitive Quality Levels** and **On Time Delivery** while operating with **safe and sustainable Practices** at “Great Workplace”. Based on the learning from TQM journey, Future plan has been evolved to realize long term objectives **Plan to realize Vision and Business Objectives**

(Table 7.1: Future Plan)

Key Focus Area	Objectives	Plan
Growth	Achieving sales Targets	1. Expanding Footprints in other than PV segment
Profitability	Improving profitability	1. Achieve EBIDTA Targets
		2. Improving monitoring of EBITDA Projects through digitization
		3. Reducing Raw material cost by taking Localization drive
Customer Quality	Focusing of Customer Rejection and Warranty	1. Resolution of Chronic issue by Quality Team
		2. Total employee involvement

7.2 Future Plans for further strengthening TQM

TF seeks to sustain the TQM journey in the future through:

1) Continuation of implementation of Deming Prize Guidelines: After challenging the Deming Prize, TF plans to sustain the drive through regular assessment on the lines of Deming Prize Guidelines and would like to challenge Deming Grand Prize in future.

2) Enhance NPD Processes

Continuing to implement the Product and Technology roadmap for new product. Improve QCD KPIs

3) Enhance the rigor of KAIZEN among All categories of Employee: after achieving the total employee involvement from Managers and Associates through various Kaizen initiatives, TF plans to enhance the sphere of improvements across TF employee covering non-permanent associates.

4) Fostering Creativity and Innovation: Plans are being drafted in the TF Group to roll out initiatives for bringing creativity and innovation. TF is committed to provide enabling atmosphere where employees strive from within for creativity and innovation.

5) Strengthening Annual Planning Process: Further strengthening of bottom-up process to develop better affinity of issues and identify improvement projects during annual planning cycle.

6) Visual Factory: Improve “how to do” area in All standards with visuals and display in reach of associates. Establish “Andons” for fast feedback.

7) Benchmarking: Benchmarking of Systems, Processes and Results with “Best in class”

8) TQM in TF’s plants and Key suppliers: Sharing TQM experience with other plants / key suppliers and help them to improve their processes and performance.

9) Spread TQM: Guide and facilitate other interested companies who want to implement TQM in India