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Tata AutoComp Systems Limited, Composites Division

1. Outline of the Organization

1.1: Background of Auto Component Industry in India:

The Indian automotive industry is third largest in terms of sales and 4th largest in terms of production volume as in FY23, contributing to 7.5% of overall GDP of India and provides employment to 38 million people. In FY23, the Auto Component Industry's revenue stood at USD 69.7 Bn.

1.2: About Tata AutoComp Systems Limited: Tata AutoComp Systems Ltd. promoted by the 'TATA Group' (largest Indian Multinational) was established in 1995 to bring auto component technologies into India to serve the emerging Indian Auto Industry and more particularly to serve Tata Motors Ltd. the largest automotive manufacturer in India that had decided to enter the passenger vehicle segment in addition to its main business in Commercial vehicles. The company is in the business of design, development, manufacturing & supply of auto-component products & services. Tata AutoComp expanded its customer base to cater to Automotive OEM's across the various segments. These products & services are being delivered to Automotive OEMs including Passenger Vehicles, Commercial Vehicles, Two & Three Wheelers, Tractors & Off-road, Aftermarket as also to allied Industrial segments like Railways and Airways. It operates through its own Divisions, Subsidiaries and Joint Ventures. Each one of these is called a Business Unit (BU). The company has 'Pan India' presence with 48 Manufacturing facilities in close proximity to the OEM's manufacturing locations. In addition, the company has 8 manufacturing facilities abroad including 2 facilities in China, 2 in Sweden, 1 each in US, Mexico, Poland and Brazil. Engineering Centres have been established in India, China, US and Sweden.

1.3: About Tata AutoComp Systems Limited - Composites Division: By late 1990's Tata AutoComp decided to build capabilities on the materials of the future in line with Tata Group's commitment towards sustainability and the society. In this context Tata AutoComp explored developing business for manufacturing composites that could replace metal parts at lower weight thereby contributing to fuel efficiency of the vehicles. Around same time, John Deere (USA), New Holland (Europe) identified India as potential manufacturing hub for small and mid-size farm tractors, they entered India and started looking for Supplier partners who could acquire SMC technology. Tata AutoComp was looking to expand its portfolio in Truck, Tractor segments and decided to explore SMC technology and formed a JV with OC (Owens Corning who were looking to expand glass fiber applications in India) and entered into a TTA with Menzolit Fibron (No. 1 SMC company in Europe), which was supplier to JD, CNH and all major Truck and Car OEMs. In 2012 the company was merged with Tata AutoComp and became "**Composites Division**". Today, **Tata AutoComp Systems Limited - Composites Division (CD)** is the Leader in Design, Development, Manufacturing and Supply of Composite parts & Assemblies for Automotive, Farm Equipment, and has niche customer base in Construction and Industrial segments in India. It has in house Compounding and Molding facilities for SMC and BMC, material formulation R&D. CD is a Full System Solution (FSS) capable supplier to Automotive OEMs including Commercial Vehicles, Tractors & Off-road, allied Industrial segments & Aftermarket. Capability progression journey and milestones of Composites Division's are shown in Exhibit 1.3.

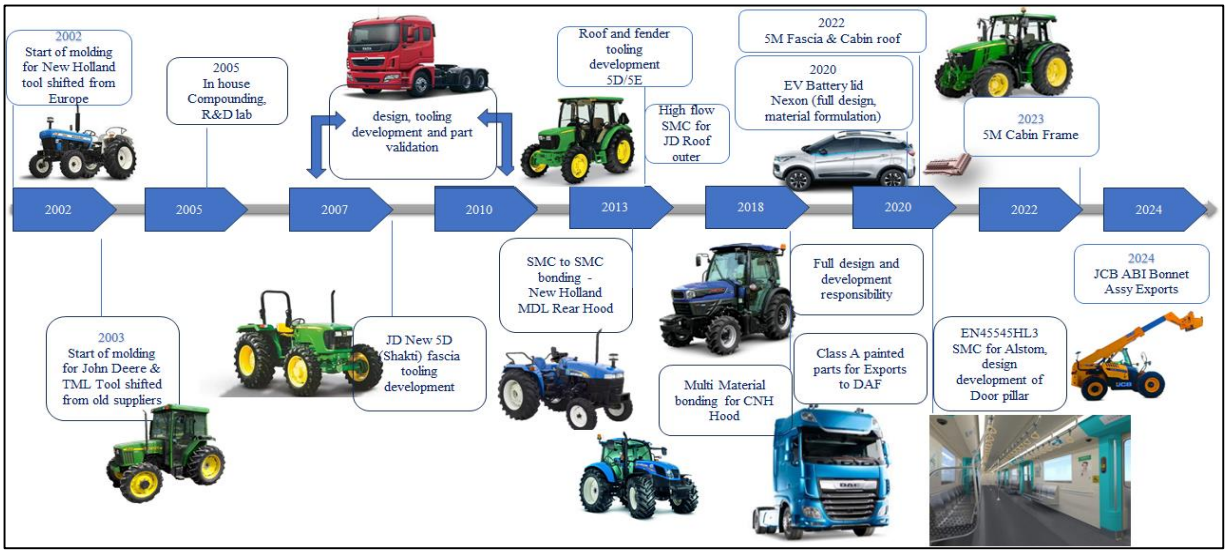


Exhibit No: 1.3: Capability Progression of Composites Division

CD is also in the process of identifying opportunities in Automotive and Industrials segment for composites using technology other than current SMC. Working closely with its customers, CD is exploring composite solutions for Fuel storage (CNG, Hydrogen), Lightweight but strong truck cargo containers and bus bodies and interiors and exteriors panels for Railways and Metro trains.

1.4: Products and Customers: Composites Division (CD) has two major product categories, Composite Parts and Assemblies – with customers in Automotive, Tractors, Off-Road and Industrial segments. SMC and BMC Compounds – for Electrical Switch gear industry and motor/ sensor encapsulations.

Exhibit No: 1.4: Segment wise Products and Customers

1.5: Manufacturing Locations: CD has its Head Quarters at Pune with a State of Art Integrated World Class Manufacturing facility in Chakan; Pune (West) spread over 8 acres. The facility is equipped with all the latest technologies (Automated Material Flow in compounding, Parallelism Control Press and Vacuum provision for Molding and Industry 4.0 for Real Time analysis and Improvement of Processes). Apart from Pune CD has strategic manufacturing Plants in Pantnagar (North), Jamshedpur (East), Pithampur (Central) and Chennai (South) to provide JIT solutions to the Customer.

1.6: Technical Capabilities: CD Specializes in thermoset composites through Sheet Molding process. The technology was acquired through a Technology Transfer Agreement (TTA) with Menzolit-Fibron of Germany between 2001 and 2008. Over time CD has been able to build capability in the entire value chain of SMC Application development right from Material formulation, part design and validation up to system assemblies. Such capability is termed as "Full System supplier" in Automotive Industry. CD has developed significant edge over competition for sustained leadership in India.CD has moved up to fully validate bonding of multiple materials with SMC parts for complex system assemblies which is considered in Industry as specialized strength in line with Global Capability scale. Technical capabilities of CD has been recognized by Global customers like Paccar Group, John Deere, CNH, NIDEC as a major differentiator, helping CD win business successfully competing at Global level.CD collaborates with Group Companies like Tata Chemicals (nano materials), Tata Motors (Automotive innovations), Tata Steel NMB, Tata Power etc to develop innovative products and process improvements.

1.7: Material Research & Development: CD R&D team formulates the composite materials according to the "end-product applications". CD has a team of Chemical and Polymer Engineers and PhD's who work with material formulation and development of compounds using a state-of-the-art lab facility to keep the company at the forefront of thermoset polymer composite technology. The key drivers for R&D efforts are light weight application development and sustainability. New formulations and novel applications are protected through Patent applications. Some of the innovations of the material research by CD R&D team is shown below since 2016. This has immensely benefited CD to provide better value to customers and thereby get the business and retain its leadership position. Total 18 number of patents filed till date by R&D and Engineering of Composites Division.

1.8: Quality Accreditations: CD is IATF16949 certified in line with requirement for Automotive segment. In addition, CD has been approved by customers who have their own Quality Audits (e.g TML, John Deere, AL, Paccar Group, Aston Martin, VW VDA6.3 etc.)

1.9: Organizational Structure: Tata AutoComp Systems Composites Division is headed by BU Head who reports to the CEO of Tata AutoComp. The Senior leadership team at CD, comprising of departmental heads (HOD's) of various key functions like Commercial Officer (TQM, Business Development, Purchase), Engineering, R&D, Quality Assurance, Finance, HR, and Operations.

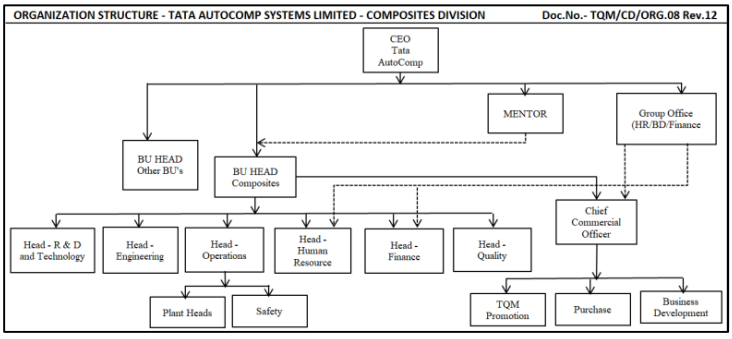


Exhibit No: 1.9: Organization Structure

1.10: Rewards and Recognition: CD's performance has been consistently recognised by it's customers and various professional bodies.

Table No: 1.10: Rewards and Recognition

Year	FY 24 (Total 33 awards)	FY 23 (Total 32 awards)
Major Rewards & Recognition	Best **"New Product Development – Localization"** award from JCB **Reliable Partner** (100% Delivery) from Daimler Innovation award from **Rail Analysis** India Award for **10 PPM** from PACCAR Group (Export Customer) Excellence in **Sustainability Award** from John Deere Best practices award (Energy) from ACMA Gold and Silver awards in QCC from QCFI	**5S Certification** from **JUSE** jointly by QCFI for Chakan, Pune Plant 5S Platinum Rating for PNR and PMPR Plant from CII **Partner Rating** from John Deere Gold and Silver awards in QCC Competitions from QCFI and TML First place in "Best **Hazardous Waste** Management" from CII **Best Supplier Award** from Ashok Leyland
Year	**FY 22 (Total 09 awards)**	**FY 21 (Total 08 awards)**
Major Rewards & Recognition	**Partner Rating** from John Deere **Diamond Rating** for Pune, PNR and PMPR Plant from CII for 5S Implementation **Gold Award** for Energy Conservation from QCFI	**Partner Rating** from John Deere **Best QCC** award from Tata Motors **Diamond Rating** for Pune and PNR Plant for 5S Implementation from CII "**Becon 5.0**" from TML for Energy Conservation Initiatives (PNR)

1.11: Market & Competition: In India, CD is the market leader in SMC parts supplies to Mobility segment with 97% market share in Tractors & Off-Road segment and 65% market share in Commercial vehicles segment. These segments account for majority of the demand. CIE Automotive, Devi Polymer and Kineco are the major competitor. They are largely into Electrical switchgear segment. CD only caters to niche customers in this segment. In Railways, buses and industrial segments, most of the composites used are made by hand lay-up process by many small moulders. CD is trying to work with customers to convert hand lay-up parts to SMC for better quality and fire safety.

Globally, Teijin Automotive (erstwhile CSP) is the largest SMC part manufacturer with plants in NA, Europe and China. Core molding technologies, Molded Fiber Glass (MFG) are other large SMC part suppliers in North America. Polytec, STS group, Senata group, Rochling are leading manufacturers in Europe. CD is currently holding 11th rank globally by revenue.

1.12 Corporate Social Responsibilities (CSR):

CD 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.

2. Business Objectives and Strategies

2.1: Background:

SMC Composites are light weight alternative to steel with significantly lower carbon footprint. CD started its journey by **moulding** SMC parts for CNH, John Deere, and Tata Motors in 2001 using technological support of Menzolit Fibron through TTA (Technology Transfer Agreement). Over the period of seven years of TTA CD team developed in-house capability **to formulate and manufacture SMC and BMC compound** at its Pune plant. In 2007 CD started a new moulding and painting facility at Pantnagar to cater to SMC part requirement for Tata Motors Small Commercial Vehicle. In 2011 CD started another new moulding plant at Jamshedpur for Tata Motors. By FY12, CD's 80% revenue was from Commercial vehicle segment. In FY15, CD faced a 25% drop in revenue due to drop in cyclic Commercial Vehicle segment. **Higher rejections at customer end and low profitability were major challenges**.

In FY16 the first Mid Term Plan of CD was created for the period **FY16-FY18** with a view to improve business performance. To improve product quality performance CD started implementation of World Class Supplier Quality (WCSQ) with help of Tata Motors, one of its key customers. To reduce high dependence on CV Segment, CD

decided to enhance its focus on customers in Tractor segment for revenue growth and started leveraging the technical capabilities of material formulation and tooling development to offer localization of imported composites parts to customers like John Deere and New Holland with good cost reduction potential. Working closely with customers CD successfully won the business for localization large composites parts which were being imported by Tractor OEMs. These initiatives helped CD improve its revenue by 1.5X at the end of MTP period. However, during the review of the performance at the end of MTP1, CD team could identify remaining problems as below:

Remaining Problems and Learnings from MTP1:

- High rejections at customer line.
- Inadequate focus on safety and sustainability.
- New product development related issues.
- Lack of challenging targets

2.2: MTP 2: FY19-FY21 - TQM Introduction Phase:

In FY19 Tata AutoComp Group established a challenging vision to be in top 5 auto-component supplier by 2025. This required a major change in direction for the group companies with below key focus areas:

- Growth: 25% CAGR for next 5 years compared to 7% CAGR achieved in past five years.
- Exceeding customer expectation on Quality
- Sustainable growth through focus on Safety, environment, and Society.

In **order to achieve its vision Tata AutoComp decided to go for group-wise introduction of TQM.**

2.2.1: CD Vision & Mission:

Since CD was already Industry leader in Automotive SMC parts in India, it decided to take an aspirational target to scale up its business to global level. In 2018 CD created its own vision to articulate its aspirations:

Vision: To be amongst top 10 Global Automotive SMC Composites Part manufacturers by 2027 through Innovative Products & Technologies, exceeding Customer expectations.

Mission: Globally admired market leader in light weight Eco-friendly Composites technology by creating a culture of Quality, Innovation and Team Work**.**

In order to work towards achieving its vision, CD carried out benchmarking of its technical capabilities, product and Customer segments with respect to top Global SMC manufacturers and identified following gaps:

- Limited market reach – CD has presence only in Indian domestic market which has a very low per capita demand for composites compared to America, Europe or China
- Limited segment and customer diversification – CD's major customer segments are Commercial vehicle and Tractor accounting for 90% of revenue in FY18 with CD having major market share in both. The global leaders had products in Passenger vehicles, Commercial Vehicles, Tractors, Construction equipment, Buses and in Industrial and other non-automotive segments.
- Gap in technical Capabilities – Structural bonding, Class A material formulations with Lower density, inhouse-Painting facility at Pune plant, ability to offer Full system Solutions to customers (from Concept to supplies)

Table No. 2.2.1: Global Auto SMC Position 2018

Company	Geographies	Global Rank FY18
Continental Structural Plastics	America, Europe, Asia	1
Polytech	Germany	2
Inoplast (PO)	Europe, China	3
Rochling Automotive	Europe, Asia, NA	4
Core	US	5
TACO-CD	**India**	**15**

Along with the learnings from past performance and gap with respect to aspirations, CD identified major challenges for MTP2:

2.2.2: Challenges for MTP 2 (FY19-FY21):

- ✓ Meeting customer needs on Product Quality in terms of rejection (from 158 to lower than 10 PPM (<10ppm target for export customer DAF)
- ✓ Development of New Products in diverse segments including new material formulations meeting customer requirements on time and cost expectations.
- ✓ To increase market share, need to understand customer value proposition and making competitive offerings to prospective customers interested in import substitution and those who do not use composite materials currently.
- ✓ For entry into Electric Vehicles, new material formulation development required to meet the application specific needs e.g. Fire Retardant, EMI compliant.
- ✓ Development of new materials for compound sales to Non-Automotive Customers
- ✓ Entry into direct export business to get access to larger market for composites.

In order to achieve Vision and to overcome these challenges, CD decided to adopt TQM methodologies at the start of FY19. Till MTP1, CD used the Balanced Scorecard (BSC) methodology to monitor business and departmental goals. CD's objectives consisted of a limited set of metrics, with particular emphasis on financial targets. However, there was inadequate focus on customer and quality. Tasks were approached in a reactive manner rather than through structured processes. This approach was predominantly result-oriented and lacked a process-driven orientation. In 2019, Policy Management process was introduced to formulate MTP, business objectives and strategies with a structured process driven approach as described below:

2.2.3: Business Planning Process as per Policy Management:

Taking inputs from Changes in External environment (PESTEL), Customer needs, Competition Analysis, internal issues and aspiration goals from Group and CD Vision, SWOT, next Mid Term plan's Objectives, Goals and strategies are finalized. These are deployed through Annual Business Plan using Policy Management Process as shown in Exhibit 2.2.3.1. These are reviewed at the Business Unit level to track the progress and for any course correction if needed.

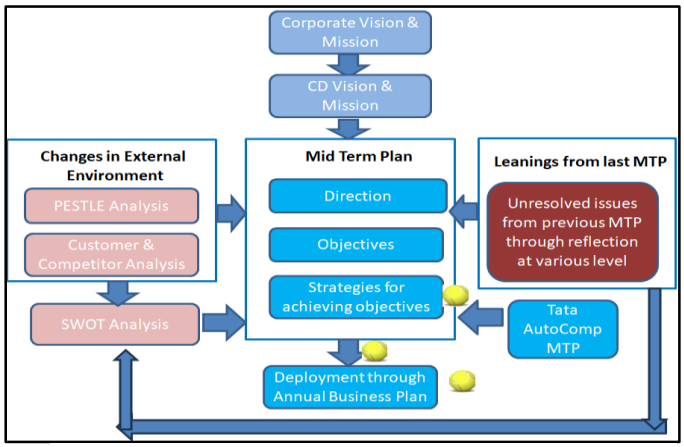


Exhibit 2.2.3.1 Business Planning Process for MTP

During MTP-2, CD faced business challenges due to COVID 19 pandemic. CD proactively took multiple initiatives to minimize impact of COVID on its employees and took following actions:

- Free Vaccination drive for all employees (including contracts) and their families and extended it to suppliers.
- Provided timely support to employees diagnosed with the virus and helped them with hospitalization and offered paid leave to them during isolation and recovery.
- Offered employees option to work from home and provided Virtual training to employees during shutdown to keep them engaged proactively.
- Offered full salary and wages to employees and did not resort to any layoffs during the COVID lockdown period.

As a result of the pandemic, CD had to make a downward revision of targets during Annual Business plan for FY21

Remaining problems at the end of MTP2

- Drop in revenue growth and marginally lower than targeted order book due to COVID 19 Pandemic
- Drop in profitability.

2.3 MTP 3: FY22-FY24- TQM Establishment Phase

To overcome the adverse business impact of COVID pandemic and continue its journey towards its vision, CD would need to grow at a higher CAGR of 25%, therefore, it is recognized that CD has to look beyond the current opportunities to identify areas of growth, and it needs a fresh approach to understand the potential customers and segments to focus on.

Identifying Growth opportunities in the current market and beyond:

CD adopted Dr. Kano's "Model of Sales" to understand uncovered demand and identify potential areas of growth by targeting to address some of the uncovered demand as shown in Table no. 2.3.a1

The exhibit 2.3.a2 shows good potential opportunity of growth for SMC by offering customers SMC parts replacing steel for applications already developed by CD like Tractor hood, Roof, fenders.

Using PESTLE CD team identified opportunities with EV, Alternative fuel (CNG, Hydrogen), Metro, Railways and Industrial segments. This gave additional future potential uncovered demand as shown in Exhibit 2.3.2.a2 using Dr. Kano's "Model of Sales". Using this, CD team has identified major opportunities to pursue which are prioritized based on potential of long term sustainable growth. CD's revenue plan with targeted business identified from the opportunity hopper is shown in Exhibit 2.3.a3

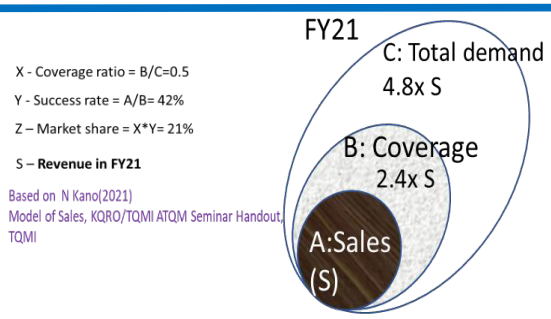


Exhibit 2.3.a3: Opportunity Hopper

Table No. 2.3.a1: CD Market Analysis

		Tractors with Composite hood (no.)	Tractors with steel hood (no.)	Value of Covered demand (Rs Cr.)	Value of uncovered demand (Rs. Cr.)
Hood	<30HP	12000	109652	3	28
	30 to 40HP	35000	251428	15	118
	41 to 50HP	75000	456221	39	252
	>50HP	65000	66861	39	43
				96	440

2.3.1: Challenges for MTP3:

- **Need higher growth rate to recover from revenue drop during COVID:** CD had to revise its revenue and profitability targets downwards due to economic Slowdown during 2020 and 2021. This led to increased gap with the target taken to achieve vision which required need for more aggressive growth strategies.
- **Lower profitability due to increase in cost of major RM Constituents:** Disruptions in Supply chain during COVID led to major gap between Demand and Supply of Raw material ingredients like Glass fiber and Resin causing sharp rise in costs leading to severe pressure on profitability.
- **Higher internal rejections:** Increase in customer expectation on quality (incoming rejection) for all major customers. while CD could improve its quality performance at customer during previous MTP, it still had higher than target rejections.

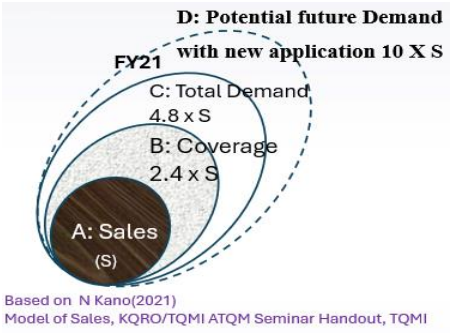


Exhibit 2.3.a2 Potential demand with new application

2.3.2: MTP 3 Strategies:

In order to grow the revenue to pursue its vision of being in top 10 Global Automotive SMC part supplier, CD has identified opportunities to prioritize and approach the targeted customers with relevant product offering as per Exhibit 2.3.2.1 which shows the broad approach through an ANSOFF Matrix for targeted business growth with Existing/new customers by offering current/new products.

Policy Management Process was further improved by introduction of "Catch Ball" for target setting and deployment of MP-CP from BU Head cascading to working level. The strategies identified for MTP3 are shown in Exhibit 2.3.2.2 with review of effectiveness using FSM (Four Student Model). Few of them are explained below:

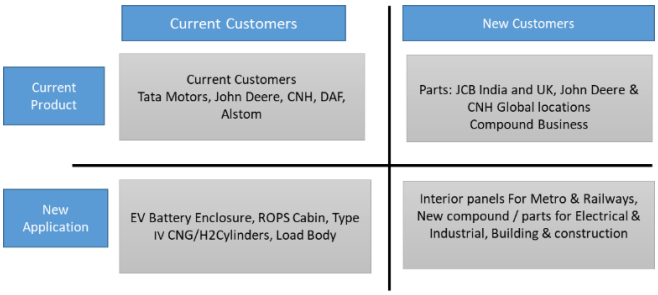


Exhibit 2.3.2.1: Current/New Products & Customers

2.3.2.1 Reduce rejection at Customer end and improve Customer Rating: To meet continuously increasing expectations on quality from customers and to meet global requirement of exports customer, CD has taken challenging target of 10 ppm. CD team planned to use Tree Diagram and Vertical Evaluation (VE) to prioritize customer issues. Training on various problem-solving tools is imparted along with increased involvement of operators through QC Circles to enhance capabilities of the team. In MTP2 CD had achieved 98% CSI Score that is the highest in Tata AutoComp and in Industry. CD added Customer Rating Improvement as Managing Point in MTP3 to further improve customer engagement for business growth.

2.3.2.2 Reduce Internal Rejection: CD has decided to continue its journey of continual improvement and took challenging target of 2500 PPM which is a reduction of 54% over FY21 baseline. Use of DWM and improvements in processes through use of 2X2 Matrix for process stability and capability improvement, using QC-Circle and Kaizen to improve employee involvement are the key levers.

2.3.2.3 Reduce Near Misses: To improve safety at workplace CD decided to Identify unsafe situations and unsafe behaviours; implement improvements and provide training to workforce to bring down number of "near miss".

2.3.2.4 Reduce Energy Consumption: CD has identified no. of initiatives to reduce energy consumption eg., implementation of Automatic Mold temperature control to reduce PNG consumption, Expansion of Solar installations at Pantnagar and Pune moulding plant area to increase %age of renewable energy usage.

2.3.2.5 Acquire new business orders by offering better value propositions to customers leveraging capabilities of R&D and Engineering. To increase the market coverage through new customer and new applications, CD has decided to focus on capturing VOC effectively and offer better value proposition using TCTC (Total Cost To Customer). The previous practice of taking inputs primarily from customer RFQ documents has been replaced by multiple data capturing methods involving interaction with number of stakeholders in the customers' organisation. involving R&D and Engineering team members, Open-Source Market Intelligence and competitor information. With these inputs a "Value Proposition document" is made with detailed comparison of **TCTC**, other tangible and intangible benefits compared to competitors' offerings.

2.3.2.6 Develop Components for Electric Vehicles: To tap opportunities in growing EV market, CD has decided to enhance its focus on developing composite material required for EV specific applications. CD team has planned to work with OEMs, EV battery manufacturers to offer value proposal for **higher DVA (Domestic Value Addition) to enable OEM claim PLI benefits**. CD has planned to work with EV startups to offer value propositions for lightweight body trims in composites which require significantly lower investment by the OEM.

2.3.2.7 Develop new product /applications in diverse segments by acquiring relevant technologies: From PESTLE analysis CD has identified new opportunities in diverse segments for business growth. These opportunities include new segments for CD **(Railways & Metro, EV, Construction equipment)** and potential applications **(Tractor Cabin, H2 storage)** which require new technologies acquisition. The company follows a structured process to prepare, review and update its Technology Roadmap with aim to develop the products for future.

2.3.2.8 Improve On time delivery and First Time Right in NPD Process – CD has taken target for improving its new product development system to reduce delays in development and improvement in "first time right design". CD uses Gate Model approach and various tools like, DoE, VOC, QFD, PUGH matrix, The process of NPD is evaluated and improved using PDCA over the period of time.

Table No. 2.3.2.2: MTP 3 – Business Objectives & Strategies

Tata AutoComp Direction	Key Focus Area based on CD Vision / Mission	CD Objectives	Managing Points	UoM	CD Strategies	DTQMP Chapter
Exceed customer expectations	Exceed Customer Expectations	Improve Product Quality	Customer Rejection	PPM	Reduce rejection at customer end using QC tools, Flag System, QAM ,VE and Six Sigma (DMAIC)	Chapter: 5.1
		To achieve highest rating from Customer	Customer Rating	Rating	1. Reduce customer rejection at Caterpillar and improve delivery performance 2. Reduce internal rejection at molding Plants using relevant QC tools and DMAIC.	
Differentiation through Safety (Mission)	Safety & Sustainability	Create safe Workplace	LTIFR	Time in Hrs	Ensure reporting of near misses and reduce near misses through use of various QC tools.	Chapter: 5.5
Sustainable products (Vision)		Contribute to reduction of carbon foot print	Power Consumption	KWH/MT SMC Consumed	Reduce energy consumption in each plant by 20% through energy saving projects	Chapter: 5.6
To be amongst top 2 Auto Component Suppliers in India	To be amongst the top 10 companies in the world in the Composit business	Enhance Revenue through product development in new segments and new markets	Enhance sales in India	INR Cr	1. Acquire new business by offering better value proposition to customers leveraging capabilities of R&D and Engineering 2. Develop components for electric vehicles in various segments 3. Develop new products/applications in diverse segments acquiring relevant technologies 4. Improve on time delivery and First Time Right product deisgn	Chapter: 4.2 Chapter: 4.1 Chapter: 4.4 Chapter 5.3
			Enhance sales in export market	INR Cr	1. Leverage current business relationship with John Deere, CNH and DAF to expand portfolio to Export 2. Use of TSS customer base (Synergy) to acquire business overseas.	Chapter 4.3
		Enhance financial performance for sustainable growth	Increase PBT	% of Sales	Reduce cost through EBITDA projects in the areas of Raw Materials, Direct Expenses and other related areas	Chapter: 5.2
Empoyee Focus	Empoyee Focus	Improve empolyee involovement	Employee engagement	Survey Score %	1. Enhance reward and recognigition 2. Enhance people capability for job performance and continual improvement. 3. Enhance employee participation through QCC, Suggestion scheme and kaizen with appropriate recognition and reward.	Chapter: 5.4
			Participation in improvement Projects	%		

2.3.2.9 Leverage current business relation with Global Customers like DAF, JD, CNH & Alstom to Grow Exports Business - During MTP2, CD started direct Exports to DAF Trucks in Europe. This gave learnings related to processes improvement, packing and logistics improvements. CD has planned to use this experience to target potential opportunities with Global customers like DAF, Alstom, CNH, JCB & John Deere. Capturing VOC to

understand current issues, identifying opportunities for improvements and working out Value propositions using TCTC form the approach to win business for Exports.

2.3.2.10 Enhance people capability for job performance: CD has identified skill development of direct employees as focus area. A structured process for enhancing skill which utilizes classroom training in "GURUKUL" by trained instructors, on job training under supervision of Production in charge. Training modules & contents are developed based on Skills gap evaluation. Associates are assessed for their skill as per the process defined. Feedback for effectiveness of training is taken from reporting managers and follow up training if needed are planned.

2.3.3: Remaining Problems and Challenges for MTP 4: While CD has achieved its targets for FY22 and FY23, it could not achieve FY24 revenue target. Major reasons for the shortfall in MTP3 and challenges for next MTP are:

- Volume Drop in Tractor Segment – in FY24, drop in demand for tractors of John Deere and CNH in both domestic and international market due to external factors cause drop in CD revenue over FY23.
- Export business – CD's major export customer in Europe was impacted due to Ukraine – Russia war, the demand for Trucks dropped leading to drop in CD export revenue compared to target. CD has been able to initiate discussions with customers like JCB and Caterpillar for exports to UK, however, packing and logistics cost are major challenge which CD needs to address on priority.
- Delay in Major new technology programs- While CD got new orders from and EV startup **for EV body parts**), and railways contractor (for **Station light boom**) and John Deere for **Cabin frame** as targeted in MTP3, the supplies are yet to start due to program delay at customer end causing a loss of revenue in FY24. Going forward CD has planned to improve target setting process and to build safeguards against potential drop.
- However, the effort made during MTP 3 period has led to the recognition of CD as a prominent supplier of SMC parts by world's top 2 manufacturer of Tractors, world's largest manufacturer of construction equipment, and a major Global Truck OEM for supplies to the markets in Europe, USA and Australia as per the supplies made and enquiries received. CD has to make its systems in compliance with the needs of the global market and build organizational capabilities to challenge and win against the global manufacturers in their home markets.

3. TQM Promotion

3.1: Background and Need of TQM: As a part of CD's MTP 2 (FY 19 -FY 21), the top management decided to follow TQM approach to realize our Vision 2027 "To be amongst top 10 Global Automotive SMC Composites Part manufacturers by 2027 through Innovative Products & Technologies, exceeding Customer expectations", which entails a significant growth in terms of revenue and also product quality. To achieve such goal requires acquisition of new markets including exports and development of new products. To achieve such rapid customer driven business growth in India and more prominently in Europe and US market we choose to build Organization Capability using TQM as a vehicle, and hence top management decided to adopt TQM organization wide since FY19. In this context, the top management decided to challenge the Deming Prize for Composites Division as an important milestone.

3.1.1: TQM Journey at Composites Division (CD): CD implemented TQM in three phases viz.

Table 3.1.1: TQM Journey

TQM Phases	Key Focus Areas	Major TQM Initiatives
Pre TQM Phase MTP 1 (FY16-FY18)	Quality Improvement by reducing customer and process rejections, improve employee involvement	a) ISO 9001, IATF 16949, ISO 14001, OHSAS 18001 b) Quality improvement through WCSQ, initiation of QC Circle and Six Sigma Projects c) Employee Engagement through **5S Initiative**, Kaizen etc. d) Safety through BSC 5 Star Rating
TQM Introduction Phase MTP 2 (FY19-FY21)	Establishment of TQM Practices, Business Growth, Quality Improvement and Customer Satisfaction	a) Formation of TQM Promotion Office, TQM Organization Structure and Steering and Functional Committee b) Setting of Vision and Mission c) DWM in Manufacturing Area (Operations) d) Introduction of Policy Management, Quality Flag System e) Improve QA System through QAM, Vertical Evaluation f) New Product Development System g) Strengthen Six Sigma, QC Circle

		h) Establishment and spread of "567-100" initiative. i) Basic Trainings on 5S, Safety and TQM Tools
TQM Establishment Phase MTP 3 (FY22-FY24)	Strengthening of TQM and Business growth through business acquisition, new products/applications in diverse segments	a) Strengthening of Policy Management and Daily Work Management and QA System b) Focus on Business Acquisition and strengthen NPD c) Advanced QA tools and stability capability matrix d) Cross Functional Management e) DWM in Support Functions f) Total Employee Involvement (TEI) g) Organization Capability Development h) Training of 100% workforce on QC Circle

3.2: Framework for TQM Implementation:

3.2.1: TQM Promotion Organization: To promote and practice TQM methodologies and to thereby inculcate the customer oriented & fact-based approach among the workforce across the Organization, the TQM organization structure was established in FY19 at CD. TQM Promotion Office was formed for centralized co-ordination and to drive TQM across the Organization. A Steering committee at Organization Level was also formed chaired by BU Head and supported by Functional Heads with their pre- defined roles and responsibilities. Department wise TQM Co-ordinators were also identified to implement the TQM activities in their respective departments under the guidance of department heads in co-ordination with TQM promotion. The progress of TQM implementation is reviewed at regular frequencies - monthly by Steering Committee and Quarterly by BU Head.

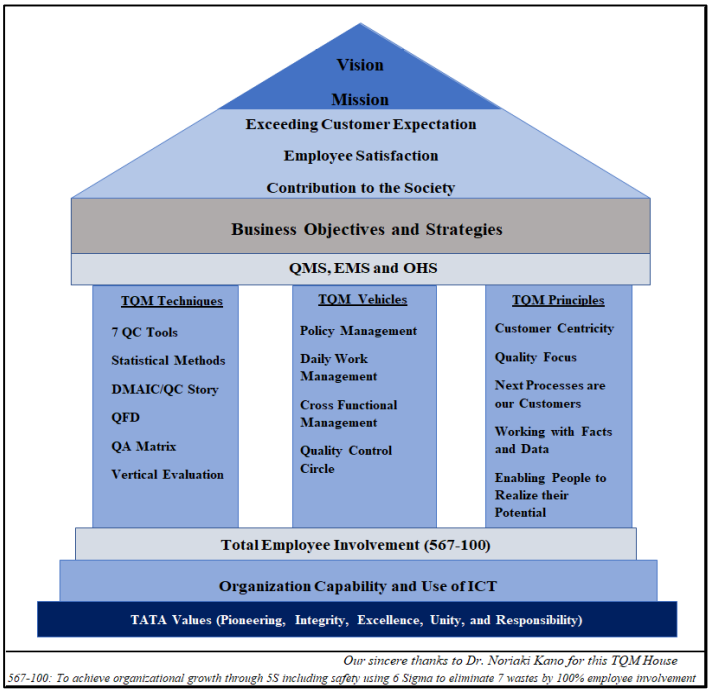


Exhibit 3.2.2.1: House of TQM

3.2.2: House of TQM: Under the top management's leadership and guidance CD has formulated the framework of house of TQM which got strengthened further with the inputs from Dr. Noriaki Kano and Mr. Mehta. The purpose is to achieve business goal by use of TQM vehicles, tools and technique on the foundation of employee involvement, capability building, and TATA values. Various Techniques (such as 7 QC Tools, Statistical Methods etc), vehicles (such as Policy management, Daily Management, CFM etc.), Principles (such as Customer centricity, quality focus etc.) are helping CD to achieve its business objectives which is in alignment to exceed customer expectations and employee satisfaction, sustainability as per company's vision. Refer fig 3.2.2.1. CD has also prepared linkage matrix to apply the various TQM vehicles/techniques in line with its business needs. Refer table 3.2.2.2.

Table No. 3.2.2.2 Business Objectives Vs TQM Vehicles and Techniques

CD Objectives	Managing Points	CD Strategies (Challenging & Base Building)	Table 3.2.2.2: Business Objectives Vs TQM Vehicles and Techniques for MTP 3									
			PM	DWM	CFM	QCC	7 QC Tools	Statistical Methods	DMAIC/ QC Story	QFD	QA Matrix	VE
Improve Product Quality	Customer Rejection	Reduce rejection at customer end using QC tools, Flag System, QAM, VE and Six Sigma (DMAIC)	Δ	√	Δ	√	√	√	Δ		Δ	Δ

To achieve highest rating from Customer	Customer Rating	1. Reduce customer rejection at Caterpillar and improve delivery performance 2. Reduce internal rejection at molding Plants using relevant QC tools and DMAIC.	Δ	√	Δ	√	√	√	Δ	√	Δ	Δ
Create safe Workplace	LTIFR	Ensure reporting of near misses and reduce near misses through use of various QC tools.		√	Δ		Δ					
Contribute to reduction of carbon footprint in the supply chain	Power Consumption	Reduce energy consumption in each plant by 20% through energy saving projects	Δ	√	Δ	√						
Enhance Revenue through product development in new segments and new markets	Enhance sales in India	1. Acquire new business by offering better value proposition to customers leveraging capabilities of R&D and Engineering 2. Develop components for electric vehicles in various segments 3. Develop new products/applications in diverse segments acquiring relevant technologies 4. Improve New Product Development Process	Δ	√	Δ	√	√	√	√	Δ		
	Enhance sales in export market	1. Leverage current business relationship with John Deere, CNH and DAF to expand portfolio to Export 2. Use of TSS customer base (Synergy) to acquire business overseas.	Δ	√	Δ	√	√	√	√	Δ		
Enhance financial performance for sustainable growth	Increase PBT	Reduce cost through EBITDA projects in the areas of Raw Materials, Direct Expenses, and other related areas	Δ	Δ	Δ		√	√	√			
Improve employee involvement	Employee engagement	1. Enhance reward and recognition 2. Enhance people capability for job performance and continual improvement. 3. Enhance employee participation through QCC, Suggestion scheme and kaizen with appropriate recognition and reward.	Δ	√	Δ							
	Participation in improvement Projects		Δ	√	Δ							

Legend : Δ - Strong Relation, √ - Moderate Relation

3.2.3: TQM Education and Awareness:

Table No. 3.2.3: TQM Trainings summary

Level of Hierarchy	TQM Awareness (including 5S, Kaizen, Safety)	Policy Management	Daily Management	Problem Solving/DMAIC/QC Story	7 QC Tools, Statistical Methods	QC Circle	SPC, PFMEA, CP, SOPs	TQM Seminar in Japan (JUSE), Advanced TQM trainings by Dr. Noriaki Kano	QA Matrix, Vertical Evaluation, 2X2 Matrix	Visit to Deming winning companies
BU Head and HoDs (Upto N-1) (09 Nos)	9 #	9 #	9 #	4 #				4 #	6 #	3 #
Middle Management (Upto N-2) (24 Nos)	24 *#	12 #	24 #	2 #	15 #	8 #	24 #*	3 #	24 #	10 #
Engineers and Front Line Workers (below N-2) (498 Nos)	498 *	22 *	180 *#	18	24 #	73 #	350 #*		120 #	6 #
Contractuals (424 Nos)	424 *									

* Internal, # External

Though the various training programs are in place from the inception of the Organization to improve the knowledge and skill of people about various technical, quality and behavioural subjects, a drive of TQM education was taken up across all levels of hierarchy in 2018 onwards which was further strengthened after Deming Diagnosis. Employees have been trained in TQM methodologies based on experience and need. TQM awareness training given to all managers and supervisors by external TQM trainer to understand TQM principles. Various training programs are conducted in continuous basis on Problem solving Tools i.e; 7QC tools, DWM, QC Circle, Vertical Evaluation, QA Matrix and 2X2 Matrix. Training on higher level

statistical tools like Design of Experiments (DOE), QC Story/DMAIC are conducted to resolve the complex issues and optimize the process parameters. Further to give exposure to senior leadership team on world class quality & thereby support our TQM Journey, training such as International Seminar on TQM by JUSE, Advanced TQM training by Dr. Noriaki Kano, ISQ Annual Conference, visit to Deming winning companies were provided. Refer table 3.2.3 which addresses level wise training identified and provided.

3.3: TQM Vehicles:

3.3.1: Policy Management (PM): Until FY18, CD developed mid term plans, followed by annual balanced score card. There were too many objectives and most of these related to financial perspective with little focus on customer, quality and safety. In FY19 as a part of TQM initiative TACO and CD recognized the benefits of Policy management approach that focuses on determining challenging prioritised objectives and stating means to achieve those objectives with focus on customer. The process of policy management starts with the formulation of corporate mid term plans followed by CD mid term plans. The MTP is 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. Based on these inputs SWOT analyses is done to determine key areas for improvement. Mid Term Plans (MTP) are getting reviewed every year and in line with the priority issues, annual policy (direction, objective and priority means) is being prepared at CD Business Unit Head level. Policy Management is being conducted every year before the start of financial year and is being attended by all stakeholders of business including all functional heads. Process of policy management is given in Exhibit 3.3.1.1. Thereafter the Annual policy is deployed to the subsequent levels using catch ball approach across various functions and at various levels. This helped to create the organization expectation amongst the employees. The catch ball session introduced before departmental objectives are under process. 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 to higher levels for corrective action. After Implementation of catch ball session, the discussion were open for the new ideas implementation, relevant projects and helped to get better understanding of practicality of the business plans.

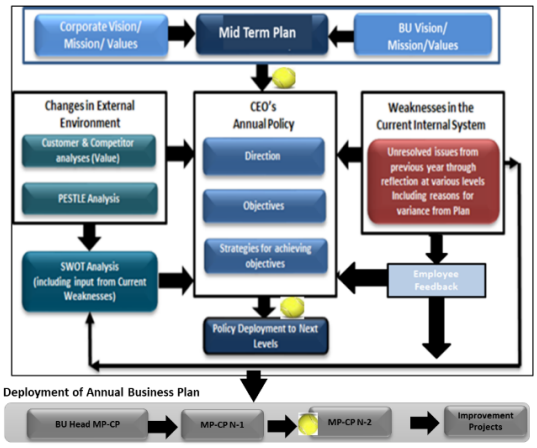


Exhibit 3.3.1.1: Policy Management Process

From FY22 started following Four Students' Model (FSM) approach to determine effectiveness of policy management on annual basis. FSM analysis (refer exhibit 3.3.1.2) shows clearly that policy attainment rate & no of policy items in student type A were increased YoY. This shows improvement in effectiveness of Policy Management process. Similarly, policy attainment rate is measured for each N-1 level also. The policy management process has been strengthened over the time through introduction of various TQM Techniques, like the catch ball mechanism process since FY22, adopting Dr Kano's modes of Sales, Capturing of Employee Feedback as an input to Policy Management since FY24.

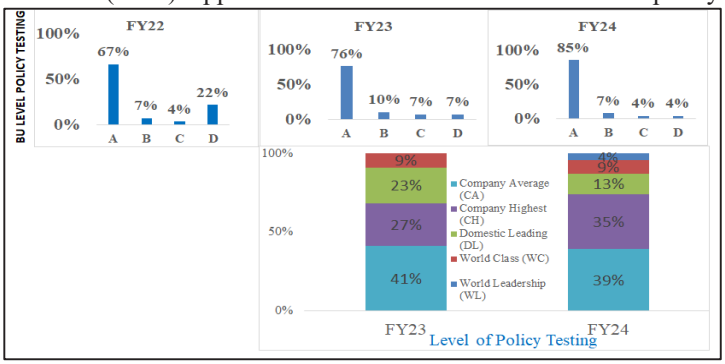


Exhibit 3.3.1.2 Four Students Model Evaluation Trend

3.3.2: Daily Work Management (DWM): Daily Work Management in TQM way had been adopted by CD with the objective to have a regular control over key performance indicators (managing/checking points) related to quality, delivery, cost, safety & morale. The sustenance of daily management had been reflected through the trends of MP/CP in each department. DWM consists of following elements roles and responsibility, MP-CP, Service Level Agreement, Standardization, Output

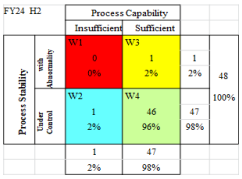


Exhibit 3.3.2.1: Stability Capability

monitoring and abnormality management. In case of any abnormality, PDCA has been rotated and after identifying the root cause for abnormality, standardization of action being documented.

Exhibit 3.3.2.2 shows the process flow chart for DWM. To manage the DWM activities at Plant level, stability capability matrix was prepared. Initially we identified 10 process parameters based on criticality from QAM and improved them over the period of time. Now, each Plant has identified the CTQ parameters (Product Parameters) and mapped them in stability capability matrix (learnings after Deming Diagnosis). Total 48 special characteristics and CTQ has been mapped for stability capability in FY24 (Ref. Exhibit 3.3.2.1). Based on this matrix, prioritization of parameters is being done to make them stable and capable. DWM Manual prepared at CD for better understanding and training purpose.

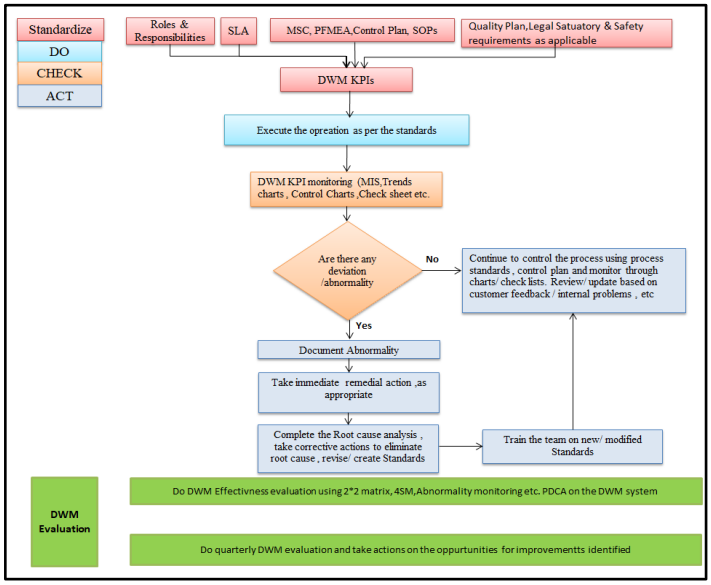


Exhibit 3.3.2.2: Daily Work Management (DWM) flow chart

Initially the DWM was implemented mainly on the shop floor and then extended to service functions. Effectiveness of DWM is also measured in terms of number of standards revised/created each year. DWM Maturity Score also evaluated. Standards in the form of work instructions, SOPs, engineering standards, process manuals, functional and training modules are created or revised based on need, Exhibit 3.3.2.3 shows the number of standards are revised or created during the implementation of DWM at CD. The implementation of 4SM to identify cause (SOP there/ followed or not; Or SOP not effective for stable operation) has also been started (Ref. Learnings from "Advance TQM" Training Session conducted by Dr Noriaki Kano).

Table No 3.3.2.3: No of standards

FY	Standards	
	Revised	Created
21	17	07
22	22	11
23	20	16
24	42	22

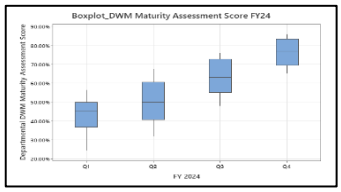


Exhibit 3.3.2.4 DWM Maturity Score

3.3.3: Cross Functional Management: To prioritise company objectives over departmental objectives by breaking down departmental barriers for those goals that can be achieved only through cooperation of various departments, CD has identified various cross functional committees for meeting QCDS&M and New product development which are led by senior leadership with members selected from various departments. 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. Each CFM is headed by the respective functional heads which is shown in exhibit 3.3.3.1. Objectives of each CFMs has also been identified. (For details, please refer base building strategies). The effectiveness of CFM is improved by studying CFM activity, their content and issues.

Table No. 3.3.3.1: CFM Relationship Matrix

EXHIBIT 3.3.3.1: CROSS FUNCTIONAL MANAGEMENT RELATIONSHIP MATRIX													
Area of CFM	Departments												
	Operations						QA	HR	R&D	Engineering	Purchase	BD	Finance & IT
	Production	Maintenance	Safety	PPC	Stores	Despatch							
Quality Assurance	○	○				○	Δ		○	○			
Cost Management	○								○	○	○	○	Δ
Delivery to Customers	Δ			○		○	○					○	
New Product Development	○						○		○	Δ	○	○	
Safety & Sustenance			Δ		○			○	○			○	
Human Resource	○		○					Δ			○		○
CSR	○		○					Δ	○			○	
Legend: Δ : Leader, ○ : Member													

3.3.4: Quality Control Circles (QCC): To involve front line employees for identifying and resolving their work-related abnormalities, arising out of daily work management and to continuously engage them in improvement initiatives by utilizing their innate knowledge, CD had launched QC Circle initiative consisting of workers and their supervisor who continually control and improve the quality of products and services. CD has revamped QC Circle initiative after Deming Diagnosis and identified the challenges and their cause. The countermeasure actions against each challenge have resulted in jump of no of QCC and participation rate both. The QCC groups are motivated to participate at the internal convention, State level, National competition. In FY24, CD's 2 QCC are qualified to participate in international QCC competition. The impact of QCC is also evaluated based on reduction in defects, cost and productivity improvement

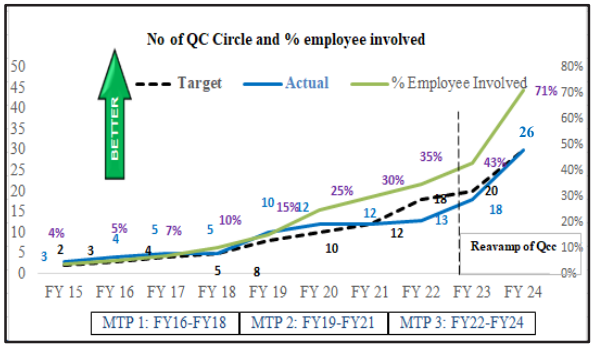


Exhibit 3.3.4.1: QC Circle Projects and % employee involved.

3.4: Total Employee Involvement: (through TQM Campaign 567-100 - introduced in 2020) With start of TQM implementation in 2018, 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. Thus 567-100, a shop floor campaign aimed at "to achieve sustainable profitable growth through 5S, including Safety in workplace, using Six Sigma as an improvement approach to focus on elimination of 7 wastes through100% employee engagement" was introduced.

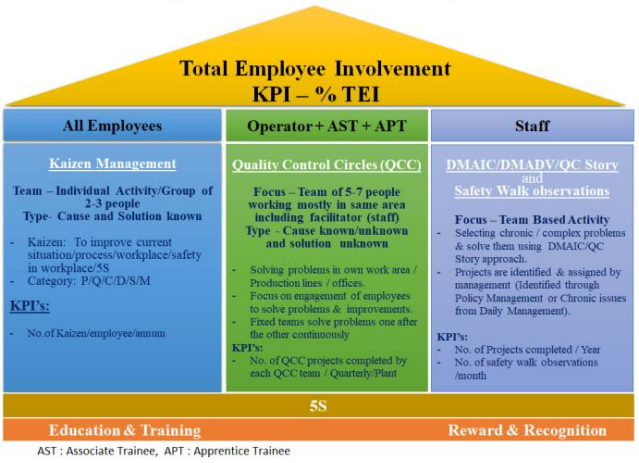


Exhibit 3.4.1: Total Employee Involvement Framework

After Deming Diagnosis, CD has prepared a TEI framework for systematic way to engage and measure the employee involvement as depicted in exhibit 3.4.1 The impact of improvement initiatives is also evaluated based on reduction in defects, cost and productivity improvement.

3.4.1 5S Promotion: We defined our 5S approach as per PDCA and defined management system chart and 5S Manual for 5S. CD has formed a "5S Steering Committee" chaired by SLT member and also a "5S Organization Structure" with their "Roles & Responsibilities" at each level. In 2020 and 2021, received "Diamond Rating" from CII. In 2022, CD's Pune Plant received QCFI (Quality Circle Forum of India) - JUSE (Union of Japanese Scientists and Engineers) award for implementation of 5S Management System (Ref. Exhibit 3.4.2).

Exhibit 3.4.2: 5S Certificate

3.5: Improvement in Process through application of ICT: ICT is extensively used to support business processes in CD. Various ICT initiatives were implemented over the period of time out of which some are summarized below:

Table No. 3.5.1: ICT projects

Sr. No.	Project	Objective	Effectiveness
1	EBITDA Portal	To track the monthly EBITDA savings	Improved the transparency and reduced the data capture time 2 days to 1 hr/month
2	Online OEE for Presses and SMC machine	Real time data analysis and actions accordingly	OEE improved 78% to 82%
3	QR Code for Traceability of Parts	To eliminate part mismatch for export customers	Zero Customer Concerns for export (from 8 to zero)
4	Digitalization of Kaizens, Unsafe situations and Abnormalities through TASK Software	Real time monitoring, analysis and quick action plan	Kaizen /person/year improved 3.8 to 4.8 in 1 year. Time reduced to fill 1 Kaizen 12 to 4 min

4. Practice of Challenging Strategies

4.1: Challenging Strategy on Developing Components for Electric Vehicles (EVs)

In the mobility segment many automotive companies globally are developing electric vehicles (EVs). In India the growth of EVs was expected to come at a CAGR of 30 to 40 % (Ref. Exhibit 4.1.1). The government had started promoting EVs by launching schemes such as Faster Adoption and Manufacturing of Electric and hybrid Vehicles (FAME) and. The phase II of this scheme was launched in FY'20 wherein the EV manufacturers who used ≥ 50 % domestically manufactured components were incentivized. Composites Division (CD) identified the opportunity of entering in electric vehicles (EVs) segment during its policy management cycle of FY'2021. There was no product of CD in any of the EVs of TATA Composites Division (CD) identified the opportunity of entering in electric vehicles (EVs) segment during its policy management cycle of FY'2021. There was no product of CD in any of the EVs of TATA Motors (TML) – potential customer and leader in the Indian passenger EVs at the time. Hence, CD decided to develop and supply components/parts for TML EVs first. EV being a relatively newer segment there were many challenges. Task Achieving QC Story method was used to execute the strategy. On evaluating various possibilities, the scenario of developing composite parts for EV Battery packs was short listed. The focussed activity was to develop composite EV Battery covers for the lithium-ion battery packs of the TML EVs. The team studied the existing composite parts that the customer imported and also collected detailed voice of customer. After assessing different manufacturing technologies and conducting initial lab trials it was confident of developing the composite battery cover in SMC technology – on this basis it received an order from the customer. The customer's key requirements of fire safety, good mechanicals and appearance were translated to technical parameters through quality function deployment. Furthermore, the key raw materials in SMC formulation were identified through an evaluation matrix. A working SMC formulation meeting the fire and mechanical performances was developed at lab. During pilot runs the team faced an issue of surface cracks in the corner areas of the molded parts. This issue was resolved by optimizing the process parameters and fine-tuning the material formulation using of design of experiments (DoE). The defect free SMC parts sent to customer qualified all battery pack level validation tests. CD's customer received cost-effective, mass-producible composite parts locally making their supply chain leaner to fulfil the growing demand. CD successfully entered in the EV segment, capitalized the opportunity for developing other components and started growing its revenue from EVs as shown in **Exhibit 4.1.3**. With this the company gained Technology leadership and became 1st in India to supply SMC parts for EVs. It has filed a patent for its SMC.

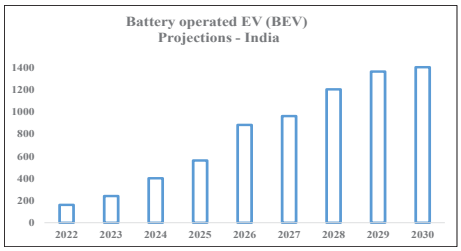


Exhibit 4.1.1: EV Growth in India

Exhibit 4.1.2: Li-ion battery pack for TML

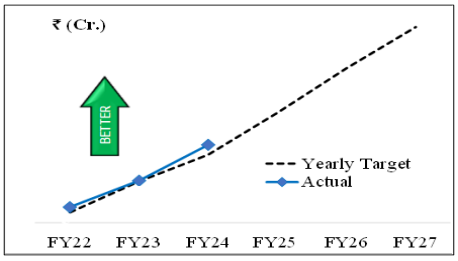


Exhibit 4.1.3: CD's revenue from EV segment

4.2 Develop New Products in diverse segments acquiring relevant technologies - Growth in Construction Equipment (CE) Segment

To achieve CD's growth aspiration, CD decided to enhance market coverage through growth in Construction Equipment segment. Potential composite parts for machines in this segment are exterior trim parts like **Bonnet**, fenders, roof which are very similar to tractor parts in form and function and operating environment. CD has been successful in developing number of product applications in Tractor Segment with customers like John Deere, CNH Industrial, Escorts and decided to leverage the experience to develop similar parts for Construction Equipment. CD identified a global customer in Construction Equipment segment with significant demand for SMC bonnet and decided to compete against the current European supplier.

CD needed to develop new SMC material, new compression tooling for SMC moulding, forming tool for steel grille, new process for bonding SMC bonnet to steel grille and develop cost effective logistics solution for export to Europe. CD team used Task Achieving QC Story methodology to identify optimum combination of options to offer better

value to customer compared to the competition. QFD was used to define product CTQs and CFM was used for establishing coordination between various stakeholders. This helped develop the complex assembly part right first time. Utilizing advanced TQM tools CD could develop the new parts in line with customer target and in line with customer's QCD requirements. With this challenging strategy implementation CD's business in Construction equipment segment is expected to grow by 10X in FY 25 compared to FY21 of which 90% is exports.

4.3 Leverage current relationship with customer to expand Export Portfolio

Composites Division (CD) had begun exporting its products to few of its customers outside India and it wanted to expand its portfolio of Direct Exports in its mid-term plan of FY'22 to FY'24. One of CD's key customer was DAF Trucks (a Paccar group company); CD was supplying Semi-finished composite parts for their plant in Netherlands and had established a good relationship with them by demonstrating consistent performance on quality and delivery parameters. CD decided to leverage this customer relationship to grow its business by offering them Fully finished parts as well. If successful, it would give an edge to the company over its international competition and lead to higher value addition and higher margins for the company. The challenge was that CD's existing capabilities were insufficient to fulfil the customer's stringent requirements related to the part finish and aesthetics. Particularly, attaining a surface tension value of more than 12 (to ensure minimum orange peel on the painted parts) was a key issue. Initial trials were marginally successful and required extensive surface preparation and skilled operators to attain the target tension value. The team then used Task Achieving QC story to develop the required capability. It carried out carefully designed experiments using DOE and optimized various process and paint material parameters making the process less dependent on the operator skills. With the improved capability CD was able to achieve tension value in the range of 12 to 14 which was comparable and, in some cases, even better than the painted parts from its European competition. CD supplied the Fully finished parts to the customer and offered them better value in terms of the quality as well as cost against the competition. With this development the company doubled its revenue from its customer taking the entire share of business of its competitor. The successful demonstration of capability for developing fully painted Class A parts of global standards strengthened CD's customer engagement and as a result it received new orders from other companies of the Paccar group particularly from Australia and UK. CD has been able to achieve **3 times growth in export revenue in MTP 3**. Going forward this organizational capability of CD will help it expand its export portfolio with other customers as well.

4.4 Acquire new business by offering better value proposition to customers leveraging capabilities of R&D and Engineering – Compound Business

CD started selling of compound materials from FY16 to increase the total revenue of the organisation. The compound materials are sold to OEMs and external moulders where the profit margin is low with high level of competition. In MTP 3, CD adopted a challenging strategy to increase compound sales at 23% CAGR (FY21 to FY24) specially with niche customers having increased margin by offering better value proposition by leveraging capabilities of R&D (Exhibit 4.4.1). One of the customers was short-listed as a valued customer for their SMC material. Hence, CD decided to acquire business from the customer to achieve target utilizing a Task Achieving QC Story methodology. The customer required SMC with special properties such as a) UV Resistance, b) Flammability of 5VA at 3 mm and c) High electrical properties CD did not have expertise to achieve UV resistance; it was first of its kind and challenging task at desired material cost. UV resistance was achieved by selecting the best option from different scenarios optimizing the material cost. Other properties like flammability, electrical with good appearance at targeted cost were achieved by QFD analysis. Finally, SMC with achieved properties was validated from the customer and started the business using various advanced TQM tools and techniques.

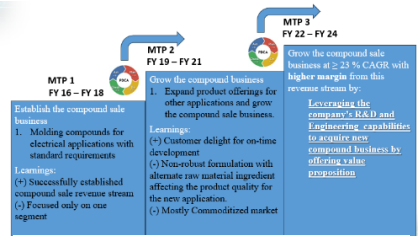


Exhibit 4.4.1: Approach to grow Compound Business

Customer/product	Value proposition to the customer
SIEMENS / BMC	UV laser printable BMC at low cost
ALLIED / SMC	FR SMC with better UV resistance and lower cost than the competition
PICL/ BMC	Encapsulation BMC (UL certified) for timely manufacturing and launch of DC motors in India.
BOSCH/ BMC	Fire safe encapsulation BMCs to replace import BMCs.

Exhibit 4.4.2: Value Proposition

The overall **Compound Sale was increased at 24% CAGR** with this business along with others (existing and new customers). The sale from premium customers is increased by 10-fold by offering value propositions to different customers (Exhibit 4.4.2).

5. Practice of Base Building Strategies

5.1: Management of Quality -Reduce Rejection at Customer end using QC Tools, Flag System, QAM and VE

5.1.1: Background:

CD aspires to become one of the top 10 global automotive SMC Composite's part manufacturers, with a focus on meeting high quality standards and reducing customer rejections to below 10PPM (parts per million) by FY24. CD was able to reduce Customer rejection over a period. However, rejection at few of the customer was still high.

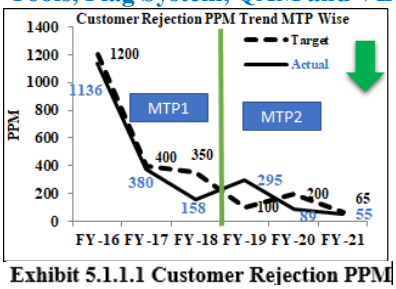


Exhibit 5.1.1.1 Customer Rejection PPM

To address this, CD adopted Cross-Functional Management (CFM) approach wherein various departments like R&D, Engineering, Business Development, and Operations are involved with a goal to further decrease customer rejection and improve overall product quality. Even though the trend of Customer Rejection was reducing in MTP-2, the Internal Rejection (in PPM) was still high – 5418 PPM in FY 21 (Refer Exhibit 5.1.1.2). In MTP 3, target of reducing the Internal PPM from 5418 (FY21) to 2500 in FY 24 (more than 50% reduction) was taken. In MTP 3, CD is also focused on improving the stability and capability of the Product Specifications using 2x2 Matrix approach. This involves ensuring that their manufacturing processes consistently produce parts that meet specifications.

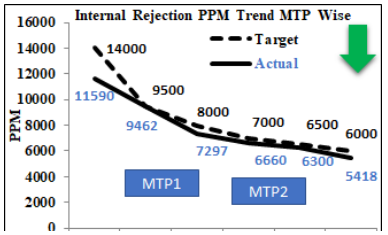
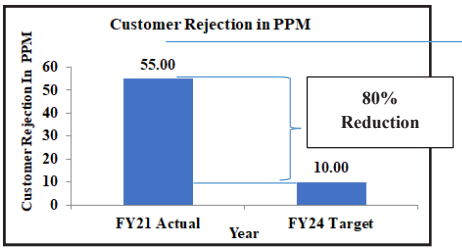
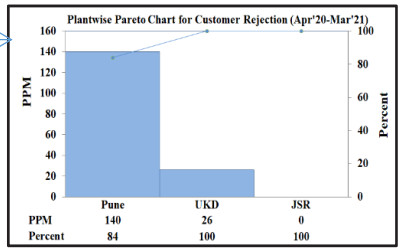


Exhibit 5.1.1.2 Internal Rejection PPM

5.1.2: Focus Activities in MTP 3 (FY22 – FY24):

Table No. 5.1.2: Focus Activities in MTP 3 (FY22 – FY24)

Challenge	**Analysis FY21**- Pune Plant Selected	**Key Focus Activity**
		1. Prevention of Defect Outflow 2. Prevention of Defect Generation **Case Study:** Segue Inner Roof Crack Reduction Project

5.1.3: History of Focus Activities:

Table 5.1.3: History of Focus Activity

Phase	MTP-2 (FY19-21)	MTP-3 (FY22-24)
Objectives	Improve Product Quality - Customer rejection in PPM from 158 to 65. Improve Customer Satisfaction Score:85 to 96%. Improve Process Quality – Internal rejection in PPM from 7297 to 6000.	Reduction in Customer rejection at Customer end from 55 to 10 PPM Improve Product Quality by reducing Internal Rejection at Molding from 5418 to 2500 PPM
Focus activities	1. Implement QA system, WCSQ in line with Tata Motors (Level 1: Defect should not leave the factory) 2. Improve customer satisfaction by use verbatim, capture voice of customer and prioritization methods. 3. Implementation of TQM tools-QA System Chart, Quality Assurance Matrix, Vertical Evaluation and Flag System 4. Use of problem-solving methodology for Structured Problem -Solving.	1.CFM approach for management of QA 2. Strengthening of QA system, Improvement in QA System Chart based on the learnings. 3. Use of QAM extended to Compounding 4. Vertical Evaluation: Implemented for multiple products. 5.Training on QC tools, Stability & Capability, Advance Quality tools 6. Flag System: Used for prioritization of improvement projects using QC Story. 7. Reduce internal rejection at Pune Compounding due to dry glass fibre in SMC.

Effects	1. Customer rejection from baseline (FY18)158 PPM to 55PPM against the target of 65PPM 2. CSAT score from 85% to 98.3% against the target of 98% 3. Internal Molding process rejection reduced from 7297 PPM to 5418 PPM against the target of 6000 PPM	1.Customer rejection from baseline 55 (FY21) PPM to 9 PPM against the target of 10 PPM 2. Internal rejection from baseline 5418 PPM (FY21) to 1917 PPM against the target of 2500 PPM
Remaining issues	Overall customer rejection is reduced but still John Deere customer rejection is high. Target is taken to reduce JD rejection below 400 PPM.	Reduce rejection of Customers having PPM more than 10.

5.1.4: Details of Focus Activities in Quality Assurance: CD is certified to IATF 16949:2016 and ISO 9001:2015, meeting the standards for Automotive and Off-road Vehicle Manufacturers. CD also qualified to meet specific qualification criteria from a range of customers like TML, Daimler, John Deere, PACCAR and others.

5.1.4.1: Focus Activity 1) Prevention of Defect Outflow:

5.1.4.1a.: Vertical Evaluation:

To prevent the defect outflow CD has extensively used the Vertical Evaluation approach. This involves identifying defects early in the production process and prevents them from passing on to the next stage. The vertical evaluation helped to analyze both customer and internal issues, leading to strategies for improvement. CD strengthened its "Quality Gate" to stop the outflow of defects.

5.1.4.1b.: Strengthening of Inspection Process and Firewall:

CD has introduced the inspection sequence in their Standard Operating Procedure (SOP) for each part, with a focus on increasing the effectiveness of the process. Visual standards were created (Limit samples for various defects) to ensure consistency and clarity among inspectors.

Table No. 5.1.4.1b.1: No of SOP Revised

Financial Year	FY21	FY22	FY23	FY24
No.of SOP Revised	7	11	14	23

These changes have led to fewer defects passing on to the Firewall Station. To meet the specific requirements of customers, acceptance criteria have been defined and training imparted to the firewall inspectors. To avoid subjectivity in visual inspection, templates for acceptance criteria like Scratch, Pin Holes etc. have been provided. Exhibit 5.1.4.1b.1 shows the Inspection SOP revised from FY 21 – FY 24. By implementing these improvements, CD was able to reduce the Rejection at Firewall from 5.98% (FY21) to 0.83% (FY24). Refer Exhibit 5.1.4.1b.2

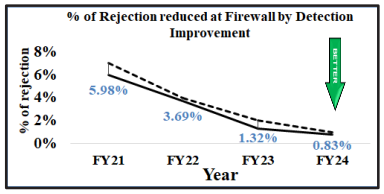


Exhibit 5.1.4.1b.2

5.1.4.1c.: Measurement System Analysis (MSA):

Till FY21, MSA was conducted to ensure the Repeatability of the measuring instruments and reproducibility of the inspectors. From FY24 onwards to increase the effectiveness of visual Inspection "Poison Test" has been introduced for inspector evaluation. This test aims to assess inspectors' ability to identify defects accurately. (As shown in Exhibit No.5.1.4.1c)

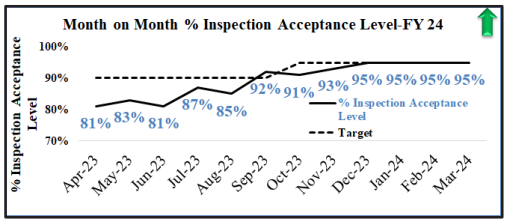


Exhibit 5.1.4.1c

5.1.4.2: Focus Activity 2) Prevention of Defect Generation:

5.1.4.2a.: Quality Assurance in Incoming Quality: CD confirms the quality of incoming raw materials through receiving inspection and in-house testing. Raw materials and bought-out parts are further tested at an NABL accredited lab. Critical Characteristics are monitored through Control Charts. CD conducts supplier Audits as per Plan by CFT comprising of QA, Commercial and Manufacturing for RM, BOP and Painting suppliers.

5.1.4.2b.: QA in Process Quality: CD ensures the QA System that builds quality into the process, to assure Product and Process quality at each stage of manufacturing (Compounding, Molding, Post Molding, Robot Milling and Assembly) following activities are carried out

5.1.4.2b.1: Process and Product Audit: Till FY21, process and product audits were conducted as a part of the 'Quality System Audit'. From FY23, to give more focus on process robustness, evaluation, and adherence to SOP, "Manufacturing Process Audit" (F/010/01) was introduced. Process audit has been strengthened to identify gap in SOPs and abnormalities in the process.QA matrix is utilized to identify strong relationship between PP (Process

Parameters) and PS (Product Specifications). This PP is controlled by Poke Yoke, PLC, Control Chart, and Inspection.

5.1.4.2c.: QA through Quality Management System Audits: Implementation of Quality Management System is ensured through various audits that are conducted as per the defined frequency for all the processes to ensure that products of right quality are delivered to the customer.

FY21 H2		Process Capability			
		Insufficient	Sufficient		
Process Stability	with Abnormality	W1 1 0%	W3 4 30%	5 50%	10 100%
	Under Control	W2 1 10%	W4 4 40%	5 50%	
		2 20%	8 80%		

FY24 H2		Process Capability			
		Insufficient	Sufficient		
Process Stability	with Abnormality	W1 0 0%	W3 1 2%	1 2%	48 100%
	Under Control	W2 1 2%	W4 46 96%	47 98%	
		1 2%	47 98%		

Exhibit 5.1.4.2d

5.1.4.2d.: Stability and capability matrix: Critical Product Specifications (PS) are monitored through control Charts and reviewed by using 2x2 matrix and status updated as and when improvements done in process. In FY 21 Only 4 PS were in W4 quadrant. After the TQM diagnosis CD identified 48 PS to be worked on in Pune and Pantnagar and have been able to bring 46 PS in W4 quadrant in FY24.

5.1.5: Major Progress (Detailed Explanation) of Focus Activities:

Strategy: Reduction in Rejection at Customer end by using Flag System and QC Story approach:

From FY22 to FY24, CD identified key challenges from previous years and developed strategies to address them. Engineers and managers received training on statistical problem-solving tools to enhance organizational capability for structured problem solving. Permanent operators were trained on Quality Control (QC) tools to encourage total employee involvement. Flag System approach was used to prioritize and select the improvement projects. Problem-solving QC Story methodology was followed for these projects. By FY22, CD had reduced customer PPM to 35 against a target of 45. The target for FY23 was further reduced to 20 against which 19 PPM was achieved.

5.1.6: Tangible Effects:

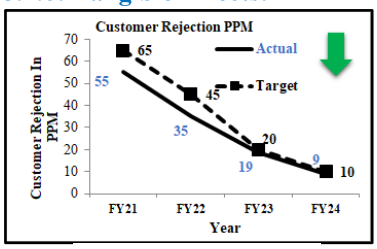


Exhibit 5.1.6.1

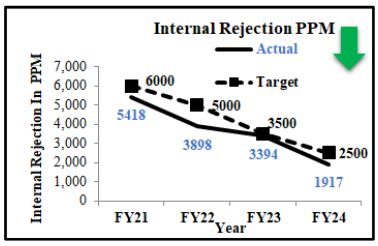


Exhibit 5.1.6.2

5.1.7: Intangible Effects:

i) Enhance knowledge of VE and QA Matrix ii) Increase in Participation and involvement of QCC Projects iii) Inspector Capability Enhanced.

5.1.8:Future Plans: i) Achieve 10 PPM target for Each Customer ii) Digitization – Vision camera system for Inspection and DWM iii) In-house Robotic Paint Shop for Consistency in Paint performance.

5.1.9: Organization Capability Developed: (i) Ability to solve problems and accomplish tasks through teamwork. (Flag System, QAM, VE and CFM), (ii) Ability to make improvements (iii) Ability to observe, gather and analyse information.

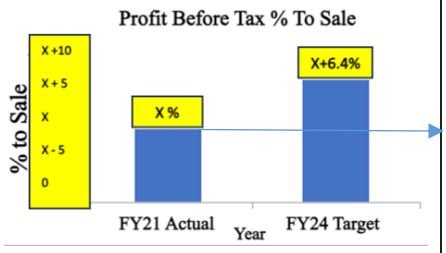
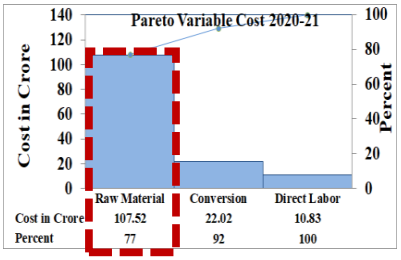
5.2 Management of Cost

Reduce cost through EBITDA Savings project of Raw Material, Conversion Cost & other related areas

5.2.1 Background: CD aimed to enhance financial profitability in MTP-II and MTP-III through cost reduction projects called "EBITDA Saving Projects." However, the strategy was not yielding consistent results, leading to a dip in Profit before Tax (PBT) in FY21 due to increased raw material cost, lack of a structured cost management team, and ineffective monitoring and review of projects. To overcome this challenge, CD formed a Cost Management Committee (CFM) in FY22 with representation from operations R& D and Engineering, Finance, Purchase. The main responsibility of this CFM was to identify, monitor and review the Cost saving projects across the value chain. MSC was prepared for structured functioning of this CFM.

5.2.2 Focus Activities (MTP FY22 - FY24):

Table No. 5.2.2: Focus Activities (MTP FY22 - FY24)

Challenge	Analysis	Key Focus Activity
		Strategy: Reduce cost through EBITDA projects in the areas of Raw Material (77% of total Variable Cost), Conversion cost, Direct Labor & other related areas.

5.2.3 History of Focus Activities:

Table No. 5.2.3: History of Focus Activities

Phase	MTP-2 (FY19 - FY21)	MTP-3 (FY22 - FY24)
Objectives	Enhance financial performance for sustainable growth	Enhance financial performance for sustainable growth
Focus Activities	**Strategy:** Drive cost reduction projects in the areas of Raw Materials, Direct Variable Cost and Direct Labour Cost (i) Start with Just Do it approach, (ii) Preparation of cost management model and process flow for project execution and (iii) Focused project selection through preparation of Cost Tree	**Strategy:** 1. Drive cost reduction through EBITDA projects in all the areas (i) MSC prepared for Cost Management Model for more structured approach, (ii) Drill down "Cost Tree" to Plant Level, (iii) Digitalization of EBITDA Improvement Program, (iv) Find alternate source for Raw Material like Glass Fibre, Additives (v) Reduce Conversion Cost by Other Projects
Effects	Exceeded PBT (Profit Before Tax) by 0.9% from the target of FY 21	Exceeded PBT (Profit Before Tax) by 1% from the target of FY24
Remaining Issues	Focus on cost saving projects on Other raw material like GF, resin, additives.	Reduction in Outsourcing cost through Inhouse Paint Shop

5.2.4: Major Progress (Detailed Explanation) of Focus Activities:

1: Cost Management MSC: In the end of FY 2021-22 CFM formed for Cost Management prepared a detailed MSC (Doc No. TQM/MSC/05-(Rev3) for Identification, Execution, Monitoring and Review of Cost Reduction Projects. It follows the PDCA approach

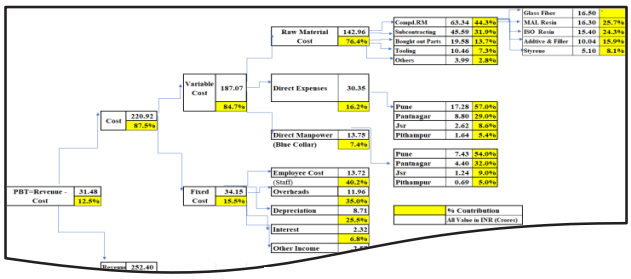


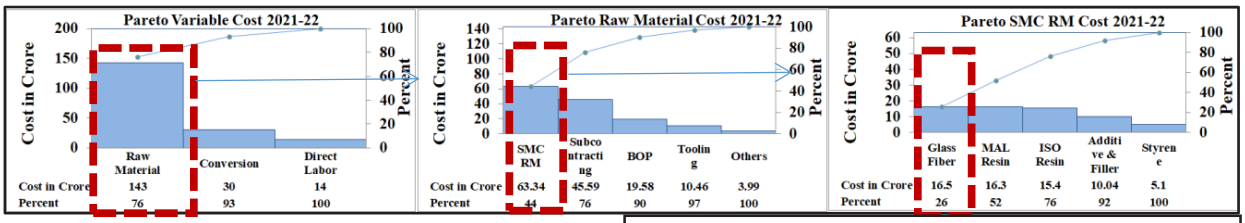
Exhibit 5.2.4.1: Cost Tree

2: Drill down Cost Tree to Micro Level: The Annual Business Plan (ABP) includes Cost Reduction Projects, or EBITDA Improvement Projects, which are enrolled in the EBITDA Portal, reviewed by the CFM, Finance Controller, and Group Leadership, using the Cost Management MSC as reference document. The Projects are identified and prioritized through the Tree Diagram approach where all the Costs are drilled down to the Plant Level. In the exhibit 5.2.4.1 explained Cost Tree for FY2021-22. The projects are executed following the Task Achieving QC Story approach.

3: Digitization: Digitization of EBITDA Improvement Program: After identification of cost saving projects, project monitoring and completion is one of the important stages. So, it was decided to digitise where all the projects are registered in a Portal, and the Project Leader can track progress. This helps to identify and resolve issues through prompt response to EBITDA saving status.

Key Focus Activity: Reduction in Raw Material Cost of Glass Fibre (GF) from Rs.1.3X to X Per Kg. without compromising Quality.

Step 1: Theme Selection: Project Trigger and Multi Level Pareto: - Cost of Glass Fibre in Calendar Year (CY) 21 was C Rs/Kg and Cost of Glass Fibre in CY 22 was 1.72C Rs/Kg. 72% Price Increase by supplier due to Market Disruption Post-Pandemic Situation.



Conclusion: GF Cost Contributes 26% of SMC RM

Exhibit 5.2.4.2: Multi Level Pareto for Cost of Glass Fibre

Step 2: Benchmarking and Target Setting

It is observed that Glass fiber (GF) price hike demanded by Current Supplier was very high as compared to Asian Price. So As per Global benchmark Target taken to reduce the glass fiber price from Rs 1.3X to Rs X/Kg

Step 3: Pursuing of Success scenario

We did Annova for Test Specimen parameter validation such as Tensile and Flexural Strength and Elongation. Annova Plot Summary and Box Plot for one of the Product Parameter Tensile strengths is shown in Exhibit 5.2.4.3 and 5.2.4.4. Standard deviation in Test specimen Quality parameter of Supplier A and B are almost same and better to our existing supplier as compared to other suppliers (C & D)

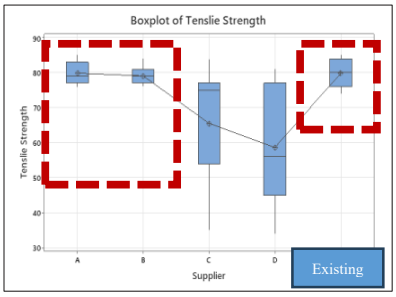


Exhibit 5.2.4.3: Box Plot of Tensile Strength

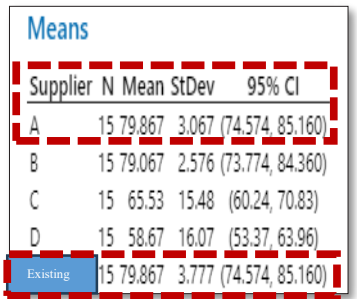


Exhibit 5.2.4.4: St Dev of Specimen A & B

Step 4: Implementation of Success scenario: - After Validation of all the suppliers, as per Evaluation matrix criteria it was found that Supplier A and B meets the requirement with respect to QCD, technical parameters and can be selected for Glass fiber supply.

Step 5: Confirmation of Effects: - Glass Fiber Price (Rs/Kg) reduced from 1.3X to <X against the target of X. No Impact on rejection levels at Molding and Compounding.

Step 6: Standardization and Fixing of Control: (i) Quality Plan revised Ref. QP/T&D/10 (ii) Contract copy of Existing Supplier is revised (iii) SOB for Glass Fibre is revised (iv) Master list of Supplier is revised.

CD has undertaken various projects to reduce the Conversion Cost (% to sales) through various productivity improvement projects, packing & logistics cost reduction and Power & Fuel Consumption reduction projects.

5.2.5 Tangible Benefits:

Achieved PBT % to sales by 1% more than the target of FY24 and Below graph shows the RMC and Conversion Cost % to sales.

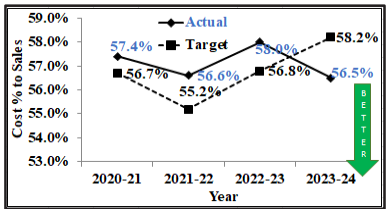


Exhibit 5.2.5.1: Raw material Cost % to Sales

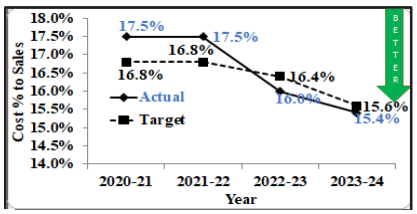


Exhibit 5.2.5.2: Conversion Cost % to Sales

5.2.6 Intangible Benefits: (i) Enhanced Process Knowledge to address fuzz generation and wettability in SMC, (ii) MSC for Cost Management CFM (iii) De-Risking of Supply chain in view of future growth (iv) Data based Decision Making (v) Negotiation Skill with Supplier by targeting on the global indices

5.2.7 Organizational Capabilities Developed: (i) Responsiveness to Change (RM Price Increase) (ii)Ability to identify issues and Problems (Tree Diagram) and (iii) Ability to collaborate between Departments (CFM Approach)

5.3: Management of New Product Development (NPD) Process

5.3.1: Background:

The purpose of the New Product Development (NPD) Process is to achieve sales growth by launching new products of right quality, on time, and at target cost for all customers. This NPD process develops new technologies, composite products, and systems for various applications by integration activities and departments.

The company didn't have a structured process in place for NPD till FY'19 and less involvement of the cross functional members from different departments, so couldn't delivery new products timely. The new products were developed to customer requirements and the technology development was not well aligned to the NPD processes.

The company started driving its NPD as a CFT in MTP-1 (FY'16-FY'18); it was driven as CFM in the MTP-2 (FY'19-FY'21). The NPD process takes care of the entire development cycle.

5.3.2: Focus Activity (MTP-3, FY22 - FY24):

Table No. 5.3.2 Focus Activity (MTP-3: FY22 - FY24)

Challenge	Analysis	Focus Activities
1. Targeted to increase On Time Product development from 92% in FY 21 to 95% FY 24.	OTD of products couldn't happen because -Non-availability of mold and BOPs and Raw material for Trials. -Detailed NPD process MSC in progress.	-Define process steps for project categories. -Updated NPD process MSC. -CFM at all stages of development. -*Gate sign off.
2.Targeted to increase First Time Right design from 92% in FY21 to 95% in FY24.	FTR design couldn't happen because of -Inadequate VoC collection, identification and prioritize CTQs. -Not much use of NPD TQM tools. -Less number of design reviews by CFTs	-Improve the VoC collection process and deploy QFD to arrive at CTQs. -Design guidelines Updating. -Train the team for maximum use of problem-solving tools.
3.Acquire technology and develop products.	-No clear Technology Roadmap to understand customer's needs.	-Charted Technology roadmap and identified key projects.

5.3.3: History of focused activities:

Table No. 5.3.3 History of Focus Activity

Phase	MTP-2 (FY19 - FY21)	MTP-3 (FY22 - FY24)
Objectives	Development of New Products which are: >On-time (OTD) and First Time Right (FTR)	Development of New Products which are: >On-time (OTD) and First Time Right (FTR)
Focus activities	1. Align the overall NPD process as a CFM to better product reviews 2. Improve Technology Roadmap creation process and align with NPD Process. 3. Evaluation of NPD Success factors.	1. Improve and follow the activities of MSC. 2. Improve the VoC collection process by QFD. 3. Gate sign-off to proceed to the next gate. 4. Train team to use of problem-solving tools. 5. Update the Technology Roadmap and develop products for diversification segments.
Effects	1. OTD Avg.79% in MTP-1 to 88% in MTP -2 2. FTR Avg. 83 % in MTP-1 to 88% in MTP-2 Increase of new products **50** vs 24 in MTP-1 C, D, E Category Projects **19** vs 5 in MTP-1 New product net sale**25%** vs 17% in MTP-1 3. Defining the NPD Success (QCD) criteria	1. OTD Avg.88 % in MTP-2 to 97 % in MTP 3 2. FTR Avg.88% in MTP-2 to 95% in MTP-3. Increased new products: **62** vs. 50 (MTP-2) C, D, E Category Projects: **23** vs.19 in MTP-2. New product net sale:**31%** vs. 25% in MTP-2 3. Developed new products and compounds. 4. Initiated tracking NPD success factors criteria
Remaining issues	1. Could not achieve the target of average OTD (%) because of delays in trials. 2. Inadequate VoC data and no QFD. 3. Difficulty to deploy problem solving tools. 4. Less number of design reviews by CFT 5. Poor evaluation of all QCD parameters.	1. Resource planning to increase NPD number. 2. Studying the market potential to diversify. 3. Automation of the manufacturing systems. 4. Manual tracking of all NPD related activities.

5.3.3.1: Detailed Explanation of Focus Activities in NPD process:

A: Definition of NPD Project Categories:

The new product development (NPD) projects categories and defined process steps. (Exhibit 5.3.3.1.A)

	Project Types				
	Existing Manufacturing Technology - SMC/BMC/IM-TP				New Manfucacturing Tech
Component Design	Similar Design	New Design	Similar Design	New Design	New Design
Material	Existing Grade	Existing Grade	New Grade	New Grade	New Material
Project category	A	B	C	D	E

Exhibit 5.3.3.1.A: NPD Project Categories.

B: Performances on individual NPD program:

Defined and started tracking NPD success criteria QCD of both internal and external from FY'23.

C: Improvement in NPD levels and MSC: MSC developed has dynamic document for review and improve NPD process linking all activities & department.

D: Gate sign off sheet: Senior management reviews with CFT and sign-off before proceeding to next gate.

E: Technology Roadmap Development Process:

Started in MTP-2 a structured process to create Technology Roadmap to identified key technology projects to meet customer and company objectives.

Phases	Tools and Practices		
	FY16 to FY18*	FY19 to FY21 **	FY22 to FY24***
• Business Acquisition	• RFQ Tracker. • Design Input List * • APQP system.	• Project charter.** • Design Input List. • Started QFD Methodology.** • RFQ Tracker. • NPD stage –gate system**	• Project charter. • Design Input List. • Pugh Matrix and DFMEA*** • QFD Methodology.*** • RFQ Tracker. • NPD stage –gate system.*** • Gate sign off.***
• Product and Process design • Proto • Production Tooling	• Design Verification. • DFMEA, DFM. • PFD/PFMEA. • Design Reviews.	• QFD Methodology. ** • DFMEA, DFM/A/S • DOE.** • CFT Design reviews** • Design Verification • PFD/PFMEA, Error Proofing**	• DFMEA, DFM/A/S • CFT Feasibility Reviews. • QFD Methodology.*** • Pugh Matrix *** • CFT Design Reviews • Design Verification • PFD/PFMEA, Error Proofing • DOE.
• Product and Process Validation • SOP	• Design validation • Process Validation. • SPC, Control plan.	• Design validation. • Process Validation. • SPC, Control plan.	• Design validation. • Process Validation. • SPC, Control plan. • T Matrix.***

Exhibit 5.3.3.1.F: Tools and Practices in NPD Process.

F. Tools and Practices added in NPD Process:

*, **, ***Marked problem-solving Tools were practiced improving NPD process. (Exhibit 5.3.3.1.F)

5.3.4: Application Case to Showcase Implementation of Focus Activities: CD used improved NPD process:

Project Type: NPD Category **"D"** (Critical Design and New Material Category.)	
Project Goals:	Design and Development of Lighting Boom SMC Panel Assy. for Metro Station by Sep 2022 meeting Functional, Aesthetic requirements and NPD success criteria targets.
Project Scope: Project focus is to design, develop and validation of Lighting Boom Assembly, and SOP.	
Challenges: Product design and Development with new grade SMC Material and Automated panel opening.	
Phases	**Design and Development**
- Business Acquisition	Understood VOCs, identified CTQs through QFD, benchmarking, translate to design. Design concept through DFMEA/DFM to meet product requirement and to detect failures.
- Product and Process design - Proto - Production Tooling	PUGH matrix for assembly concept and raw material selection. Design Verification done through development of Proto. Part designed for easy assembly, tooling, as per customer acceptation. Failure modes, potential causes and effects identified for each process steps.
- Validation - SOP	Critical operations are done on robot. Fixtures are deployed to develop variants. Based on failure mode - identified controls at respective locations in control plan.

Effects: SOP in time meeting all QCD criteria and increasing company revenue by entering into a new segment/area.

	Quality			Cost		Delivery		
	First Time right Design	Customer PPM(SOP+ 3 Months)	Internal PPM(SOP+ 3Months)	Compliance with pricing Policy-Part	Compliance with pricing Policy-Tool	Material Readiness for T0	T0 timeline compliance	On time product launch
Target	Zero number of changes before PPAP	10	2000	Yes	Yes	As per timeline	As per timeline	As per timeline
Actual	Yes	0	1500	Yes	Yes	No delay	No delay	No delay

Challenges Faced and Tackled: Product design and development with below requirement: SMC with FST compliance and automated panel opening for service was finalised by PUGH Matrix.

Learnings: 1. Defined NPD process gave confidence to team to design and develop with easy. 2. CFM approach of NPD has helped to achieve better results.

5.3.5: Tangible Effects:

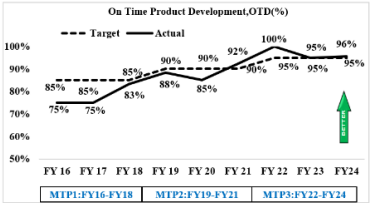


Exhibit 5.3.5.1 On Time Product Development

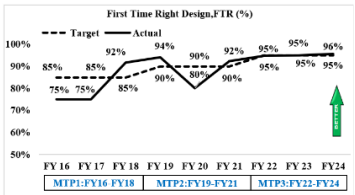


Exhibit 5.3.5.2 First Time Right Design

5.3.6: Intangible Effects:

1. Enhanced knowledge on TQM tools to improve NPD process, CFM and coordination.

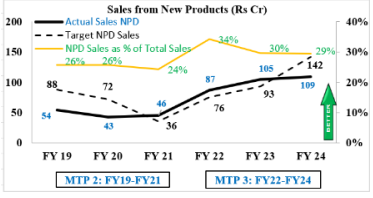


Exhibit 5.3.5.3 Sales from New Products.

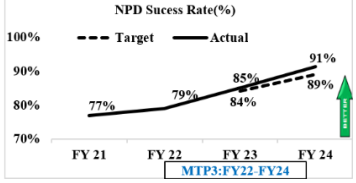


Exhibit 5.3.5.4 NPD Success Rate

5.3.7: Organizational Capabilities Acquired: 1. Ready to handle multi category projects with improved NPD processes. 2. Knowledge of advanced TQM tools increased competency of design team.

5.3.8 Future plan: 1. Achieve 100 % OTD and FTR designs. 2. NPD process Digitization. 3. Building people's capability to face new challenges.

5.4: Management of Human Resource

5.4.1: Background: Tata Auto Comp Systems Limited - Composites Division since its inception in the year 2000 has grown from one location, Pune to 4 locations in India. Enhanced Focus and Effort to sustain and increase employee engagement as an important strategy is expected to augment productivity and morale. Employee engagement and employee involvement have been an important factor in the growth plan of CD. Skill enhancement and capability development of employees is integral to the strategic growth phase of Composite Division for existing business as well as emerging business opportunities.

5.4.2: History of Focus Activities:

Table No. 5.4.2: History of Focus Activities

Phase	MTP-2 (FY19 - FY21)	MTP-3 (FY22 - FY24)
Objectives	Improve Employee Involvement	Improve Employee Involvement
Focus Activities	1)Involvement of employees through 567-100 approach 2) Rewards & Recognition 3) Training & Development 4) Skill Enhancement	1. Enhance reward and recognition 2. Enhance people capability for job performance and continual improvement. 3. Enhance employee participation through QCC, and kaizen.
Effects	Employee Engagement Score Increased from 85 % to 86 %. Skill Enhancement – L2 to L3- 28 Associate Skill Enhanced, L3 to L4- 8 Associate Skill Enhanced.	Reward & Recognition till date for FY24 Achieved 480 Nos against the target of 360 Nos. Skill Enhancement – L2 to L3- 30 Associate Skill Enhanced, L3 to L4- 18 Associate Skill Enhanced.
Remaining Issues	Focus on Rewards & Recognition Focus on Training on QC Story & QCC Involvement.	Further focus on Capability building based on TQM tools & techniques.

5.4.3: Major progress of Focus Activities:

5.4.3.1: Employee Engagement: Employee Engagement survey is conducted once in 2 years by an independent third-party agency for all staff employees online. The company uses the globally established surveys to measure employee Engagement survey. Employee's feedback is obtained on various attributes of engagement and its findings are analysed. Based on analysis of survey findings, following areas are prioritized for improvement action are initiated.

A: Enhance Reward & Recognition: Reward and Recognition schemes have been increased over last 3 years. Following 3 initiatives has been introduced in FY 2022-23 I) TQM Contribution Award II) Sustainability contribution Award III) QCC Award. Beneficiaries of Rewards & Recognition showing an increasing trend shown as (Exhibit No 5.4.3.A) to recognize maximum employee's covering staff and direct workforce.

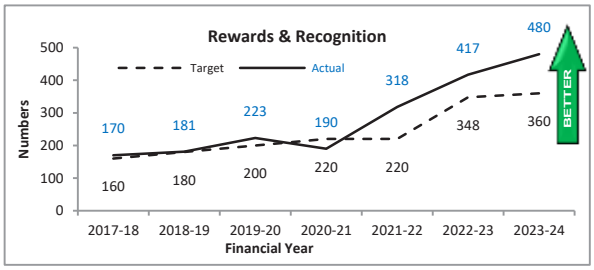


Exhibit No 5.4.3.A

B: Pay: Compensation as an employee recognition has been improved through the process of Selective Compensation correction and revision based on employee performance, critical skills of the employee, potential of the employee to perform on the job and market comparison as part of the overall performance evaluation process. Employee Compensation Revision growth is mentioned (Exhibit No 5.4.3.B).

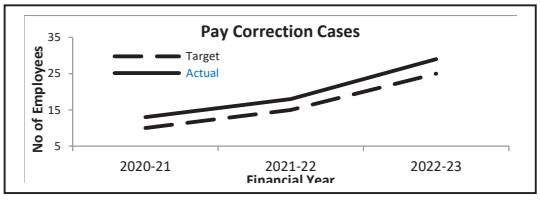


Exhibit No 5.4.3.B

C: Career Development and Opportunities: With a view to enhance employee engagement, CD initiated Internal Job opportunities for emerging positions as well as replacement positions for their employees. Employees were encouraged to take enlarged role and responsibilities as CD gained more business in both automotive and non-automotive sector. Further with a view to provide continuing technical and managerial academic qualifications. Employees coverage through various Programs as below.

Table No.5.4.3.C

Programs	Symbiosis PGDBM	BITS: B.Tech Program	Toyota Operational Excellence Program	Blue Mint program	First Time Managers program	Leap Vault Program	Post Graduate Executive General Management' programme (IIM Nagpur)
Number of Employees	5	2	14	3	3	1	3

5.4.3.2: Enhance People Capability for Job performance:

A: Skill Enhancement of Associate: To meet our growth aspiration & Improve employee participation, CD decided to improve skill levels of employees. CD initiated an approach to enhance skill of Associates which was part of imbibing TQM Culture there by 'Facilitating Change for the organisation with focus on productivity and quality. Training Centre named "GURUKUL" was created to impart classroom training focusing on Manufacturing operations. Skill Enhancement process is shown in Exhibit 5.4.3.2.A

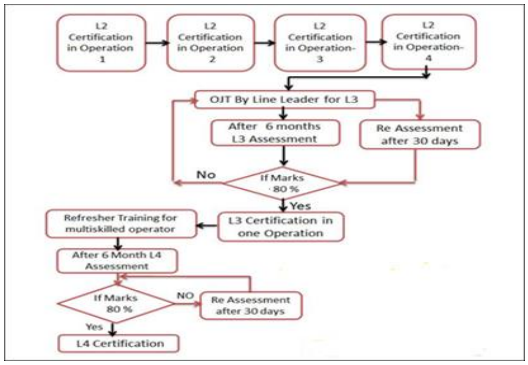


Exhibit No 5.4.3.2.A

5.4.3.3: Enhance Employee Participation:

A: Enhance Employee Participation through QCC: CD launched QCC initiative in FY15. During MTP 1 & MTP 2 period the participation was very low. Lack of awareness in QCC was identified as one of the major causes. Training related to QCC methodology and usage of 7 QC tools were given by internal and external trainers. This helped to improve employee's coverage from 55 Nos in FY22 to 363 Nos cumulatively upto FY24. (Exhibit No 5.4.3.3.A) with 100% coverage of Associates and supervisors.

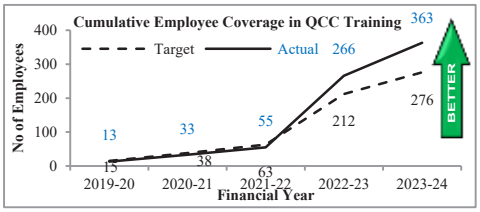


Exhibit No 5.4.3.3.A

B: Enhance Employee Participation through Kaizen: Employees are encouraged to do kaizens in their respective work area. Various communication methods such as open house, Departmental meetings are used to encourage the kaizen participations. Employees are recognized for best kaizen award in every month in open forum which aim to encourage the participation.CD has now digitized the kaizen process which has advantages as below 1) Easy to track, monitor & its closures 3) Enable faster analysis. Employees are encouraged to participate in kaizen competitions help by various professional agencies such as CII, ACMA, QCFI wherein employee can showcase their improvement in larger forums. Kaizen /person/year shown as below (Exhibit No 6.11).

5.4.4: Organization Capability: To meet its Vision, objectives and strategies and to be ready for future, CD has developed a structured process of capability building. Organization capability building is predominantly based on A) People capability and B) Process Capability. CD has prepared a long-term business plan with identified business opportunities for the growth of business. Based on Mid Term Plan, business objectives and strategies, the functional capabilities required are identified to meet the business needs based on i. TQM related tools and techniques, ii. New Product, Process required for future growth, iii. strategies identified in MTP to meet objectives iv. Manufacturing equipment / Infrastructure required for New Products/Process. Each departments identifies the new capabilities required based on strategies and the requirements of new products, process and infrastructure. The leadership team decides on whether the capability is to be developed with training the present employee or to hire the required the capability resource from outside. Based on this input, capability development plan for ABP has been prepared. Also, as a part of TQM Promotion and implementation, each department has identified training needs. A Training plan is prepared by HR Department at the Company level.

5.4.5: Tangible Benefits:

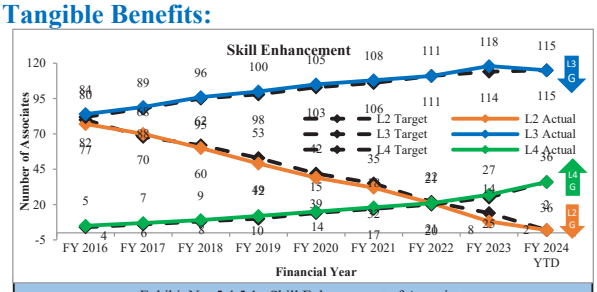


Exhibit No. 5.4.5.1 : Skill Enhancement of Associate

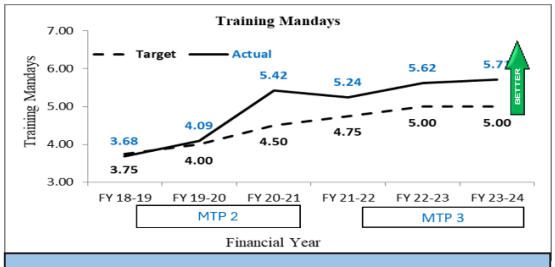


Exhibit No. 5.4.5.2 : Training Man-days

Employee engagement increased from 84% to 90% (Ref. Exhibit No 6.13), QCC participation increased from 10% to 71% (Ref. Exhibit No 6.11), Kaizen/Person/Year from 1.8 to 4.5 (Ref. Exhibit No 6.12)

5.4.5: Intangible Benefits: Increase in Morale, Opportunity for employees to acquire new competency for career growth, Improved Collaboration and Teamwork.

5.5: Management of Safety

Identification and Elimination of Unsafe Conditions/Act through the use of Various QC Tools

5.5.1: Background and Purpose:

CD commits to provide safe and healthy work environment by setting up safety standards and procedures. British Safety Council system was adopted for safety management in MTP-2. To transform the safety culture of the organization from Reactive to Behavioural Based Safety (BBS), Cross Functional Management (CFM) was formed with representation from Operations, Human Resources and Purchase with the objective to achieve ZERO LTIFR (Loss Time Injury Frequency Rate) by People involvement and Training. Reduction in number of unsafe conditions using QC tools and Toyota 6+2 Methodology was the strategy chosen to achieve this objective.

5.5.2: Strategy and Focussed activity:

Challenge

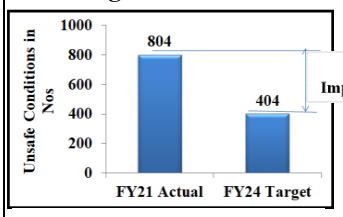


Exhibit 5.5.2.1: FY21 U.C. T/A

Analysis FY 21

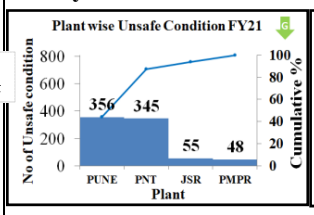


Exhibit 5.5.2.2: Plant wise U.C.

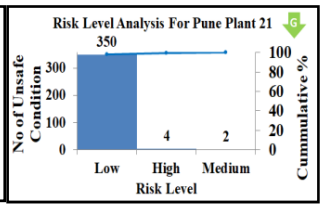


Exhibit 5.5.2.3: Risk Level of U.C.

Focus Activity:

Pune and PNR Plants selected for Reduction of Unsafe Conditions (U. C).

5.5.3: History of Focused Activities:

Table No. 5.5.3: History of Focused Activities

Phase	MTP-2 (FY19 - FY21)	MTP-3 (FY22 - FY24)
Objectives	Create Safe workplace	Create safe workplace.
Focus activities	(i) Implement safety practices based on BSC guideline. (ii) Regular Safety Audits, Safety Walk, (iii) PPEs usage and Machine Guarding (Poke Yoke), (iv) Proactive Safety Approach – (HIRA) and Mock drills, (vi) Near misses / Unsafe Conditions reporting and	**Reduction in Unsafe Conditions by 32% through Plant wise and Risk level drill down using Vertical Evaluation framework.** "Stop 6+2" methodology from Toyota to capture report and avoid unsafe condition.
Effects	Zero accident cases across all Plants.	Zero LTIFR across all Plants
Remaining issues	High response time observed in Fire Mock drill	More Safety Poke yoke in Paint shop, frame manufacturing through Digitization

Key Focus Activity: To sustain zero LTIFR through identification & elimination of Unsafe Conditions by using VE. Before FY21 Unsafe conditions (Low Risk) were reported without any classification of hazards. From FY21 onwards unsafe conditions were classified as per the various hazards category (Toyota 6+2 **A**ctuator, **Big**, **C**ar, **D**rop, **E**lectrical, **F**ire, **G**illette, and **H**ealth Hazard). This classification helped in prioritizing the Hazard to be worked upon. CD was able to reduce the unsafe conditions caused due to drop hazards from 108 to 01 and sustains its target of Zero LTIFR. The same framework is being followed for Pantnagar plants.

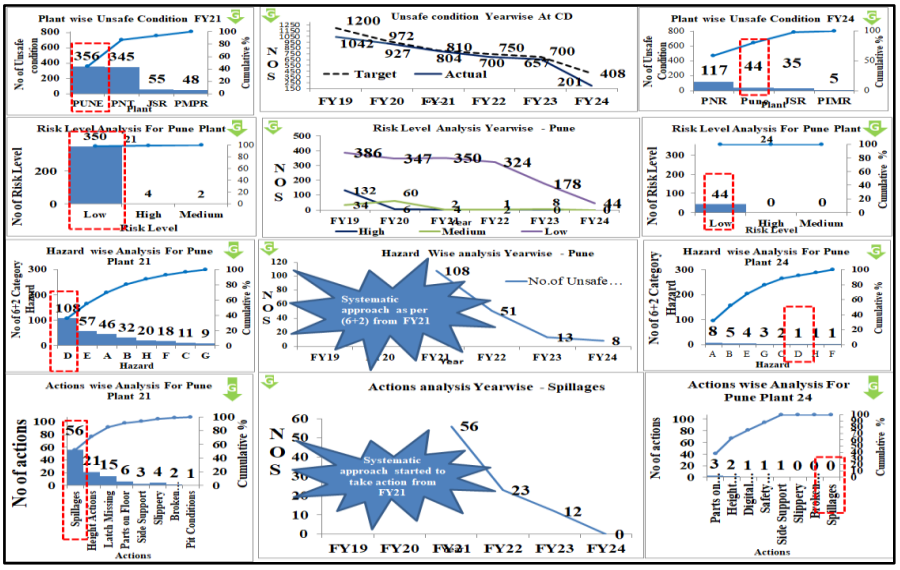


Exhibit 5.5.3: Vertical Evaluation on elimination of Unsafe Conditions

5.5.4: Tangible Benefits:

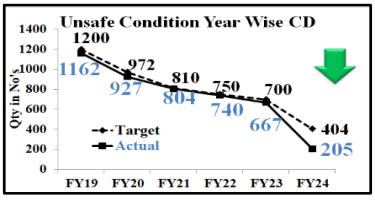


Exhibit 5.5.4.1: Year wise Unsafe Conditions

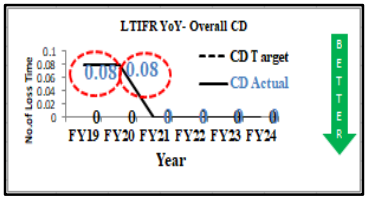


Exhibit 5.5.4.2: Year wise LTIFR

5.5.5: Intangible Benefits: (i) Reduction in Fire Response time (ii) Increase in safety awareness, (iii) Ease in Quick Implementation in Safety abnormality by TASK Software, (iv) Reduction in Operator Fatigue, (v) Significant Improvement in Drop Hazards

5.5.6: Future Plan: (i) Installation of Safety Mat near Press and Robot Area (ii) Reduction in response time of Fire Mock drill (iii) Foam System in Upcoming Paint Shop (iv) Fume Extraction System implementation in Cabin Manufacturing

5.6: Sustainability

Reduce Energy Consumption by 20% through Energy Saving Project

5.6.1: Background and Purpose: CD commits to provide sustainable and environment friendly operations to achieve its growth targets by minimizing Green House Gas emissions using Greener fuel (PNG) and by using maximum allowed Renewable Power for its manufacturing processes. In MTP 2, CD listed down the Sustainability KPIs which were to be monitored, acted upon, and reviewed. The Moulding operation requires high temperature in the Mould (150-160^{0}C). This is achieved through Boiler for which the fuel used earlier was low-cost Furnace Oil generating high emission. One of the key challenges was to replace this with "Greener" fuel like Piped Natural Gas (PNG) without impacting the operational cost. Other Challenge was to reduce the Carbon emissions by optimizing the Power Consumption and using Renewable (Solar) Power. To achieve this, CFM compromising of Operations, R&D, Quality Assurance, HR and Finance was formed in MTP-3; with the objective to reduce power consumption across all the plants through energy saving projects.

5.6.2: History of Focused Activities: Table No. 5.6.2: History of Focused Activities

Phase	MTP-2 (FY19 - FY21)	MTP-3 (FY22 - FY24)
Objective	Create Sustainable Operations	Contribute to reduction of Carbon Footprints
Focused Activities	(i) Installation of solar panels in Pune and Pantnagar Plants, (ii) Replace FO with PNG gas in Pune Plant and LPG with PNG gas in Pantnagar Plant, (iii) Replace normal power feeder with Express (Continuous) power feeder (iv) Tree Plantation in nearby Communities	**(i) Identification and implementation of energy reduction projects in Mould Shop across the plants,** (ii) Enhance the Solar Panel Capacity to increase the % of Renewable Power(iii)Recycling of SMC Moulded Scrap Components.
Effects	Use of Solar Power from 0 to 19.3% of total Power. Reduction CO_2 (26.5 to 19.09 T), Sox (2.35 to 0.05 Kg/Cr sale and Nox (0.08 to 0.04 Kg/Cr sale)	Power Consumption reduction from 796 to 620 KWH/MT in FY24. Use of Solar Power is 25%, reduced emission of greenhouse gases.
Remaining issues	Recycling SMC Moulded Parts	100% Recycle of SMC Parts Rejected and Net Zero Emissions till FY27

5.6.3: Focused Activity: Plant wise drill down of power consumption using Tree Diagram and "Reduce Energy Consumption by 20%". Power consumption is drilled down up to the zone wise for each Plant. Task Achieving QC Story approach followed for the projects. As per Power Consumption tree, Pantnagar Plant has the highest consumption. In Pantnagar various projects has been identified in different areas to achieve 20% reduction in power consumption and also reduced **Pune Plant Power Consumption from 555 (FY23) to 486 (KWH/MT of SMC Processed) by Mar'24.**

5.6.4: Tangible Benefit: Power Consumption reduced from 715 to 620 KWH/MT

5.6.5: Intangible Benefits: (i) Application of Tree diagram, (ii) Use of Battery-Operated Forklift instead of Diesel in all Plant, (iii) Improvement in Employee Awareness towards recyclability of Thermoset material

5.6.5. Future Plan: (i) Replacement of PNG fired with Publish electrical heating in Pune Plant, (ii) Use of 100% Renewable Power, (iii) 100% Recyclability of SMC Parts (iv) Publish of Sustainability report in Portal.

5.7: Management of Corporate Social Responsibility (CSR)

5.7.1: Background and Purpose: Tata AutoComp Systems - Composites Division is committed to inclusive, equitable and holistic development of communities which is essential for nation building and for sustainable growth of the organization. This is in-line with the Tata group approach towards communities and social responsibilities practiced over long period of time. Organization's growth also considers factors of Environment, social and Governance for building Nation's growth with sustainable approach.

5.7.2: Process for Selection of Key Communities: Key communities are identified and selected for CSR based on systematic evaluation. The criteria for selection and evaluation as below:

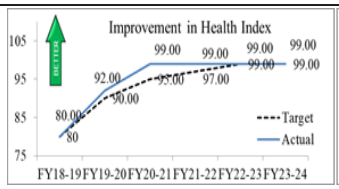
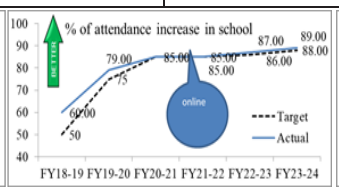
Table No. 5.7.2 Process for Selection of Key Communities

Community Issues	Interactions with Local Govt. Bodies, Local members, Tata Groups Initiatives and TATA Trusts, Findings local communities' common requirements
Validations	Field Visits, Interactions with prospective Beneficiaries, all stakeholders
Idea Selections	Interviews with CSR Change makers and HR Head, Identifying projects implementations
Projects Concept Design	Designing the projects along with Local bodies, NGO, Role of stakeholders- Resource provisions, Proposed outcomes, and Durations
Leadership Review	Review with BU CSR SPOC, Review with BU Head
Approvals	Approvals from CSR committee, SDCA Cycle for the process

Employees volunteering for the CSR activities are named as "Change makers". CD identified Rajubai Wasti and Zila Parishad Schools in Pune location and students in these schools are from backward / tribal community. In Pantnagar location CD selected Amarpur School for improvement. The major focus areas identified were Education, Health, Hygiene, drinking water facilitation and Girl's education.

5.7.3: History of Focused Activities: CD is aligned to the overall Group's CSR policy which has eight Pillars as identified below which contributes to society. After the evaluation of MTP2 activities, focus areas increased from 3 to 8 with the same resources. year on year focus activities of Composites Division is mentioned below: -

Table No. 5.7.3: History of Focusses Activities

Phase	MTP-2 (FY19 - FY21)	MTP-3 (FY22 - FY24)
Objectives	Contribution to Communities in 3 areas	Contribution to Communities in 8 areas
1) Sanitation, Health, and Hygiene 2) Art Craft activity 3) HOPE 4) Youth Skilling 5) Orphanages 6) Digitisation 7) Water and Sanitation 8) Resources and infrastructures	1) Medical Health check-up started in 1 school, Sanitation done during Covid, E-Toilets provided at 2 locations. 2) Improved talent of 2000+ Children. 3) Educational help for 5+ Girls 4) Skill Development in Fitter Trade in 2 area. Started programs for Chakan. 5) Grocery support – 1 Old orphanage. 6) 160+Tabs provided for E-Learning's in Covid. Online sessions for 6000+ nos. 7) Water facilities provided at 1 area; Sanitation program started for girls 8) Building infrastructures for 2 schools, Stationery provided to 2000+ children.	1) Medical Health check-up started at 3 schools, Improved Health Index to 99 %, E-Toilets are provided at 15 locations. 2) Improved talent of 3000+ Children. 3) Educational help for 8+Girls 4) Skill Development in Fitter and Diesel Mechanic Trade in 5 areas. 5) Grocery Support for 2 Old orphanages. 6) 320+Tabs provided for E-Learning's Online sessions conducted to 5000+ students 7) Water facilities provided at 5 area: Menstrual hygiene program for girls. 8) Building infrastructures for 5 schools, Stationery provided to 5000+ children.
Effects		
Remaining Issue	Enhance activities from 3 to 8	Enhance number of activities from 8 to 10

5.7.4: Intangible Benefits: Goodwill of CD improved in the nearby area, increased confidence of School students

5.7.5: Future Plans: Development of Girls beyond academics, focus on the sustainable growth, Support youth in emerging skills, Increase health and hygiene levels as well as enhanced responsibility for Organization.

6: Effects of TQM

CD has introduced TQM as a vehicle in line with its envisaged Vision and for building Organizational Capabilities. For the objective identified during MTP 2 and MTP 3 in chapter 2, following exhibits show the effects of challenging and base building strategies.

6.1: Tangible Effects:

Legend : Target — Actual

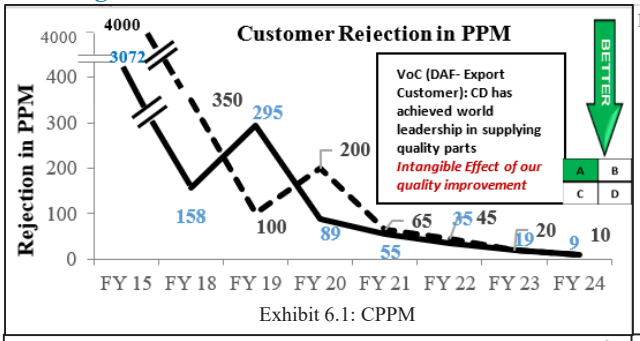


Exhibit 6.1: CPPM

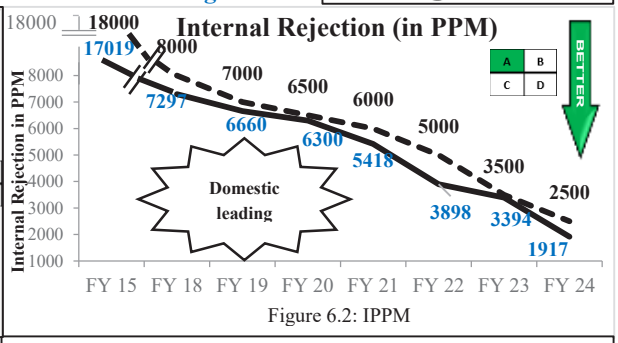


Figure 6.2: IPPM

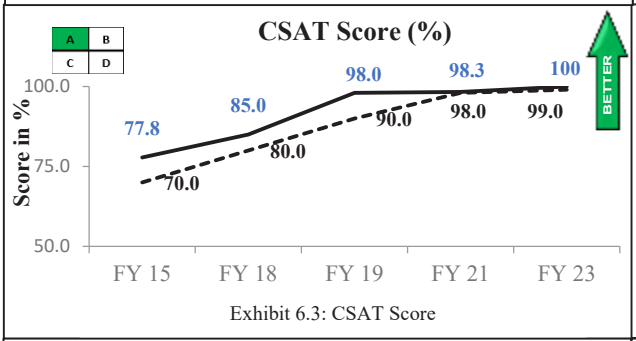


Exhibit 6.3: CSAT Score

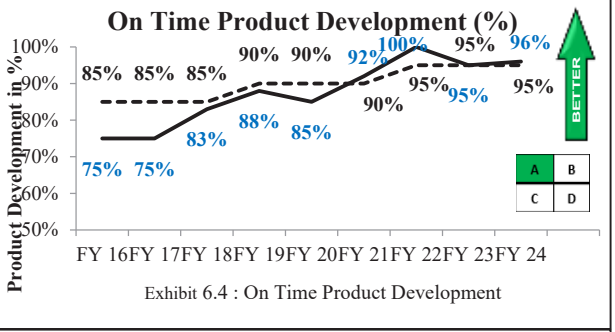


Exhibit 6.4 : On Time Product Development

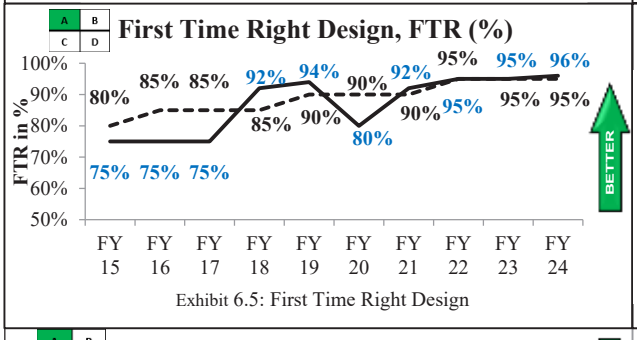


Exhibit 6.5: First Time Right Design

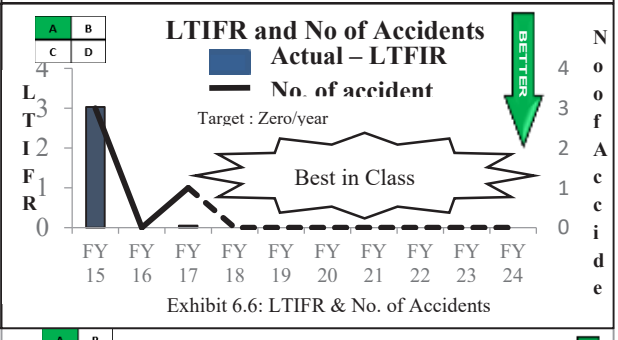


Exhibit 6.6: LTIFR & No. of Accidents

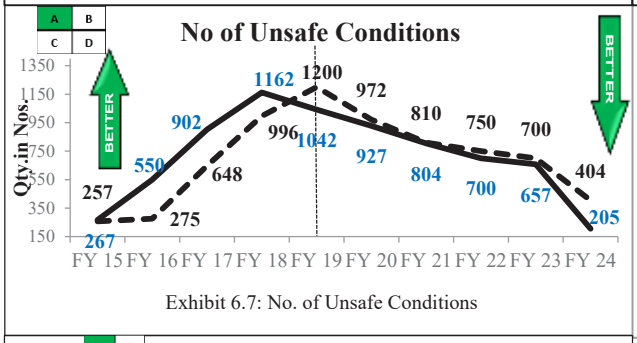


Exhibit 6.7: No. of Unsafe Conditions

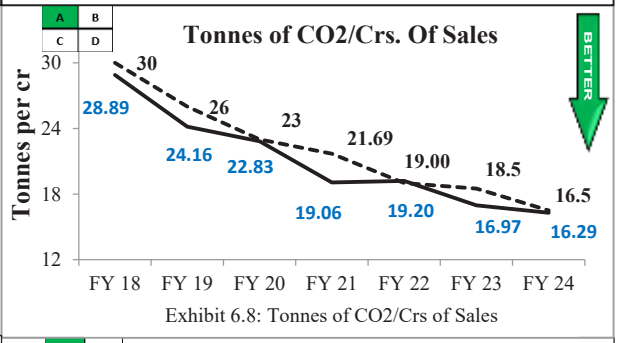


Exhibit 6.8: Tonnes of CO2/Crs of Sales

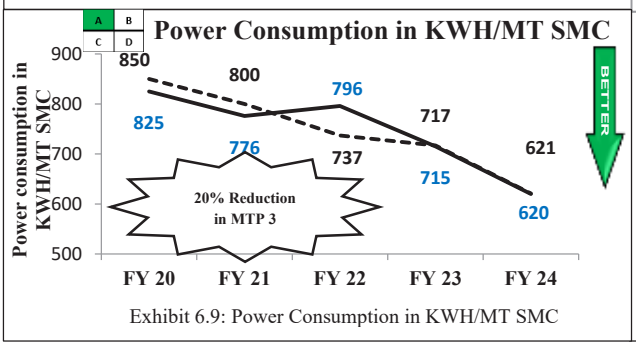


Exhibit 6.9: Power Consumption in KWH/MT SMC

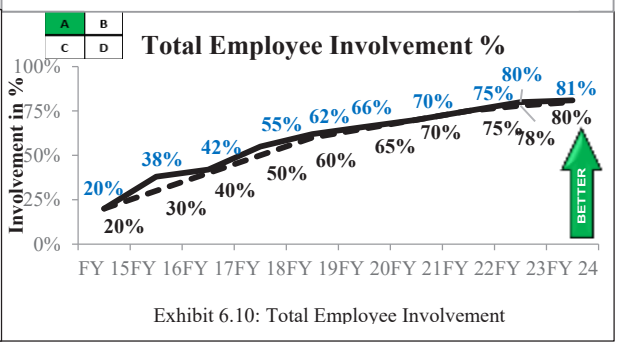


Exhibit 6.10: Total Employee Involvement

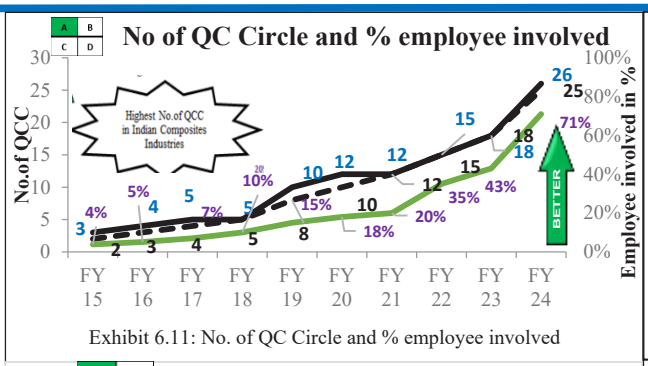


Exhibit 6.11: No. of QC Circle and % employee involved

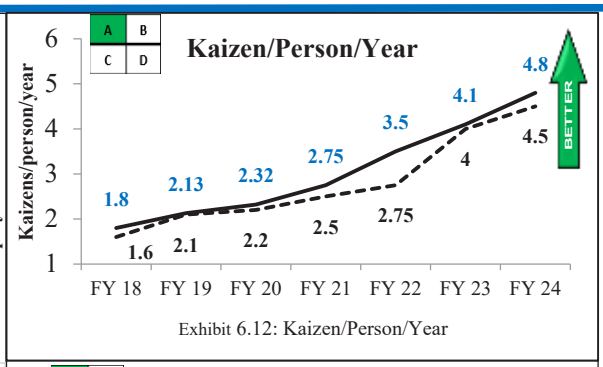


Exhibit 6.12: Kaizen/Person/Year

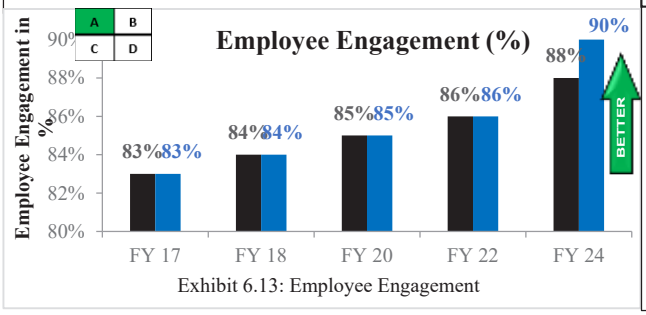


Exhibit 6.13: Employee Engagement

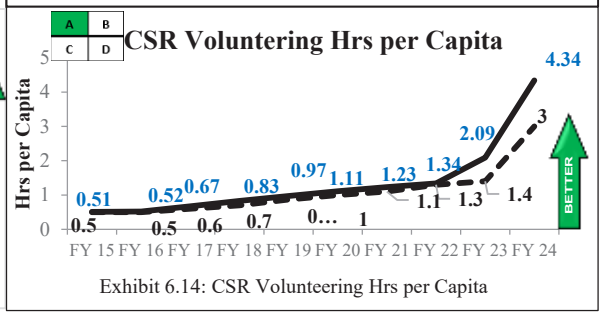


Exhibit 6.14: CSR Volunteering Hrs per Capita

6.2: Intangible Benefits:

1. Enhanced knowledge on TQM tools and techniques and capabilities of problem solving using statistical tools. 2.Customer (internal & external) focus increased in all processes. 3. Improved coordination and teamwork through CFM. 4. Culture of standardization, Daily Work Management & PDCA improved.

Above mentioned tangible benefits helped CD to won various rewards & recognition.

7: Future Plan

Considering CD's aspirational vision of "To be amongst top 10 global automotive SMC composite part manufacturers by 2027 through innovative products & Technologies, exceeding customer expectations" and based on the learnings in MTP 3, CD plans to enhance Business Development efforts using Dr Kano's model of Sales so as to have higher Order Book pipeline to nullify effect of drop in volume due to external factors. The method of volume forecasting in case of Start-ups, New technology products is being improved.

Furthermore, the following areas are identified for strengthening the TQM practices in future:

- ✓ Strengthen Policy management based on evaluation of objectives through FSM. Strengthen annual planning process to ensure Cause and effect relationship and identify improvement projects.
- ✓ For Daily Management, build capability to identify abnormalities and take countermeasures particularly in non-manufacturing processes.
- ✓ Develop people capability in the use of Task Achieving QC Story for breakthrough improvement and innovation.
- ✓ Improve problem-solving capability by training people to consciously understand the status through Gemba observations and after analysis evaluate effectiveness of each countermeasure to understand its impact on the outcome.
- ✓ Develop people capability in effective use of Kaizen and QC Circle to overcome the issue of participation and problem-solving capability while improving the Quality of Work Life. CD plans to enhance the sphere of improvements across all employees covering non-permanent associates.
- ✓ Spread TQM practices to other plants and Suppliers.

Furthermore, Tata AutoComp Systems Limited - Composites Division is also committed to support other Business Units of Tata AutoComp Group in their TQM journey and wants to further enhance its TQM level on the lines of Deming Prize Guidelines and would like to challenge Deming Grand Prize in future.

8: Terminology Glossary

Sr No.	Terminology	Explanation
1	ABP	Annual business Plan is a road map for a company and its employees.
2	ACMA	Automotive Component Manufacturers Association
3	BITS	Birla Institute of Technology and Science
4	BMC	Bulk Molding Compound-thermoset matrix composite consisting typically of a mixture of thermosetting polyester resin, thermoplastic additive, and Filler
5	BOM	Bill of Material
6	BSC 5 Star	British safety Council 5 Star
7	CFT	Cross Functional Teams-are groups of people from various departments in an organization who work together to achieve a common goal
8	Charge Pattern	Charge pattern in the context of Sheet Molding Compound (SMC) refers to the specific arrangement of the SMC material before it is molded into a final product
9	CII	Confederation of Indian Industry
10	CNG	Compressed Natural Gas
11	Compound	A substance formed by combining two or more ingredients in a specific ratio.
12	CPPM	Customer Parts Per Million-measure of the number of defects in a process or product
13	CSAT	Customer Satisfaction
14	CV	Commercial Vehicle
15	DFMEA	Design Failure Mode and Effects Analysis
16	DMAIC/DMADV	Design Measure Analyze Improve Control / Define Measure Analyze Design Verify
17	EMS	Environment Management System
18	ERP	Enterprise resource planning
19	ESG	Environment Social Governance
20	EV	Electrical Vehicle
21	GF	Glass Fibre
22	GURUKUL	Training Centre name in CD
23	HIRA	Hazard Identification & Risk Assessment
24	ICT	Information and Communication Technology
25	IPPM	Internal Parts Per Million-measure of the number of defects in a process or product
26	IPR	Intellectual Property Rights-the legal rights given to the inventor or creator to protect his invention or creation for a certain period of time
27	ISQ	Indian Society for Quality
28	ITI	Industrial Training Institute
29	KWH/MT	Kilo Watt Hour per Metric ton of SMC Processed
30	KPI	Key Performance Indicator
31	LPG	Liquified Petroleum Gas
32	LTIFR	Lost Time Injury Frequency Rate
33	MIS	Management Information System
34	MSA	Manufacturing Site Assessment - An Initiative by Tata Motors
35	OEE	Overall Equipment Effectiveness
36	OEM	Original Equipment Manufacturer
37	OTD	On Time Development
38	PESTEL	Political, Economic, Social, Technological, Environmental and Legal
39	PNG	Piped Natural Gas
40	PUGH Matrix	It is a criteria-based matrix to compare and evaluate multiple design options against a set of criteria.
41	PV	Passenger Vehicle
42	QCFI	Quality Circle Forum of India
43	QFD	Quality Function Deployment-structured approach to defining customer needs
44	QRB	Quick Response Board
45	Resin	Resin is a natural or synthetic organic compound that is typically viscous
46	SMC	Sheet Molding Compound-high-strength composite material comprising primarily a thermosetting resin, filler (s), and fibre reinforcement
47	SWOT	Strengths, Weaknesses, Opportunities and Threats
48	TACO	Tata AutoComp Systems Limited – Upper Organization of Composites Division
49	TGW	Things gone wrong
50	WCSQ	World Class Supplier Quality -An Initiative by Tata Motors