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Tata Power Delhi Distribution Limited

1. OUTLINE OF THE ORGANISATION

1.1 Overview of Power Distribution Sector in India

The power sector value chain in India is largely divided into three different functions i.e., Generation Company (GENCO), Transmission Company (TRANSCO), and Distribution Company (DISCOM). Under the Indian Constitution, power is a concurrent subject and both central & state governments can formulate laws for governing the Power Distribution Sector. About 92% of this sector is dominated by state government-owned power distribution companies (in terms of revenue) and there are 5 major private companies, viz., Tata Power Ltd., CESC Ltd., Torrent Power Ltd, Adani Electricity Mumbai Ltd & Reliance Infrastructure Ltd as illustrated in **Figure 1.1.** The key customer requirements from a distribution company are availability of affordable and reliable power supply, timely provision of new connections, accurate billing, and timely resolution of complaints. The Aggregate Technical and Commercial (AT&C) loss is a key metric for evaluating the financial performance of a distribution company. It is primarily the difference between the energy supplied & energy collected in terms of revenue.

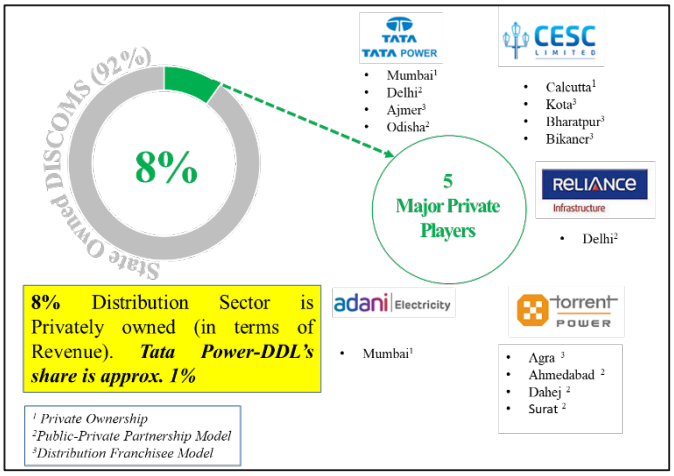


Figure 1.1: Overview of Distribution Sector in India

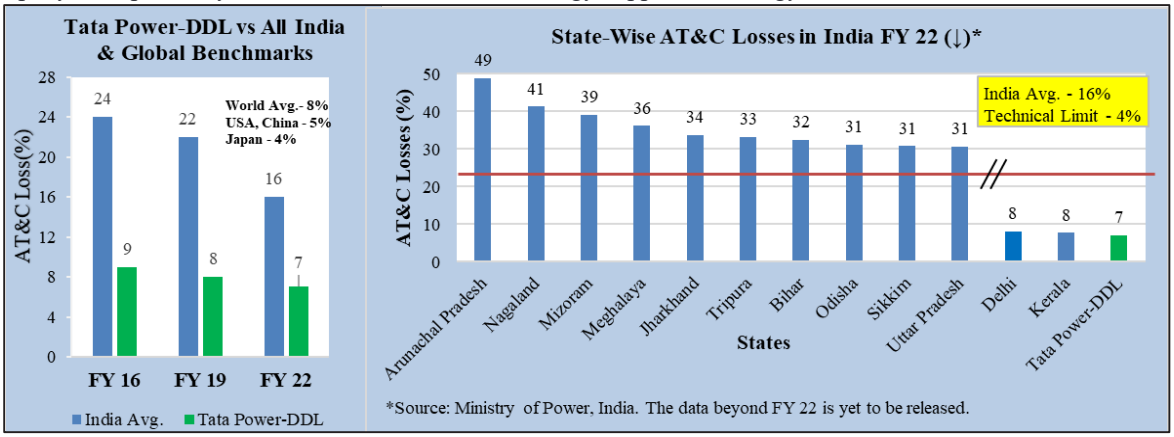


Figure 1.2: Global & National Comparison of AT&C Losses

Most DISCOMs are making heavy losses because of rampant power theft, poor distribution infrastructure, inefficient operations, poor customer services & lack of corporate governance (**Figure 1.2).** The DISCOMs inability to pay power generators endangers the financial health of the generators and their lenders, causing a negative cascading effect on the economy. Further, these losses prevent DISCOMs from making the investments required to improve the quality of the power supply. Owing to these factors, power distribution continues to be the weakest link in the power sector value chain across India and, in many other developing countries.

1.2. Tata Power Company Limited

Tata Power was established by Shri Jamsetji Tata (founder of Tata Group) in the year 1915 with the vision "*Clean, cheap and abundant power is one the basic ingredients for the economic progress of a city, state or country"*. Today, Tata Power, together with its subsidiaries & joint entities, has a generation capacity of 14,464 MW of which 38% comes from clean energy sources. It is one of India's largest integrated power company and has the distinction of being among the top private players in each segment of the power sector value chain including solar rooftop and value-added services. Tata Power now has over a century of expertise in technology leadership, project execution excellence, world-class safety processes, customer care and driving green initiatives. Tata Power is committed to "lighting up lives" for generations to come.

The Transmission & Distribution (T&D) Cluster of Tata Power focuses on the T&D segment of Power Sector. In the Distribution Sector, Tata Power is responsible for ensuring affordable, reliable & quality power supply to over 12 million customers spread across Mumbai, Delhi, Ajmer and Odisha. The subsidiary of Tata Power T&D Cluster providing electricity supply in Delhi is Tata Power Delhi Distribution Limited (Tata Power-DDL).

1.3. Brief History of Tata Power-DDL

Tata Power-DDL (earlier name NDPL) was incorporated in July 2002 as a Joint Venture (JV) of Tata Power with 51% share and the Government of National Capital Territory of Delhi (GoNCTD) with 49% share, on the Public-Private Partnership (PPP) model. Tata Power-DDL took over the license to distribute electricity in the North & North- West part of Delhi through a competitive bidding process initiated to reform the electricity distribution sector in Delhi wherein the erstwhile state government owned Delhi Vidyut Board (DVB) was unbundled into a GENCO, TRANSCO and three DISCOMs **(Figure 1.3)**. Tata Power-DDL supplies electricity through its distribution network at tariffs regulated by DERC to approximately 2 million customers with a peak demand of 2218 MW & energy demand of 10983 MUs (as on 31-Mar-24) in its licensed area (510 sq. KMs.). In an environment where power distribution utilities across the country are under heavy losses and experiencing acute power shortages and quality issues, Tata Power-DDL has consistently overachieved its targets and scripted an unprecedented turnaround story. In a span of 15 years, the AT&C loss levels were reduced from 53% in FY 02 to 8.59% in FY 17 (a decline of 83%) against a countrywide average of approx. 33.98% (a decline of 35%) showcasing one of the few success stories of the PPP model post implementation of distribution reforms. Further, major improvements were brought about in the reliability of network and customer services in **Table 1.1.**

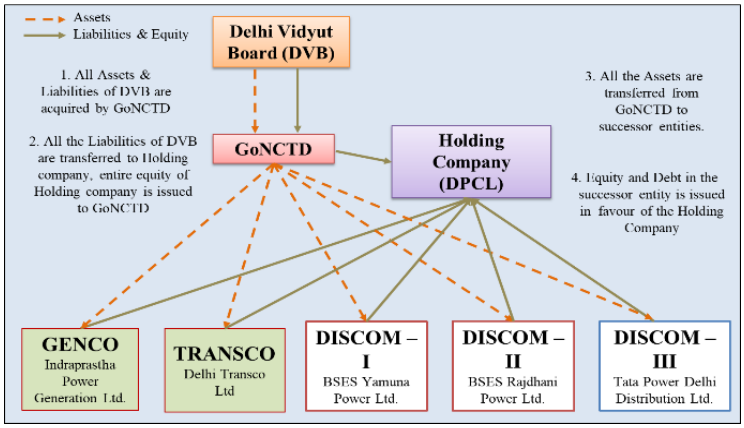


Figure 1.3: Delhi Power Distribution Privatization Model

Table 1.1: Pre and Post Privatization Reforms (before TQM implementation)

Initial Challenges - 2002	Pre-TQM Implementation Scenario- 2017
AT&C Losses at a level of 53% (Input Energy – 3928 MUs) - rampant theft	AT&C Loss level @ 8.59% (Input Energy - 9040 MUs) unprecedented reduction of 83% from opening loss levels
Dilapidated Network on the verge of collapse - Transformer failure rate of 11% (Capacity - 1926 MVA), only 48% streetlights functional (Total streetlights – 96000 nos.), power cuts of 8-10 hrs. /day increasing to 12 hrs. in summer.	Revamping of infrastructure with redundancy (N-1) and advanced technology-SCADA, OMS, DMS & DA implemented. Improved Power Reliability with 99% system availability. DT Failure rate @0.71% (DT Capacity - 5225 MVA), 93% reduction from opening levels and Streetlight functionality with 100% (159,742 nos.).
No Concept of Customer Services	One Stop solution for customers, State of Art Call Center, Integrated CRM & Customer Care Centers. CDI improved to 90%.
Lack of Performance orientation	Performance Orientation through Change Management & Balanced Scorecard Approach. EEI improved to 83%.

1.4. Business Environment

Tata Power-DDL supplies electricity through its distribution network at regulated tariffs to all customers in its licensed area. The value chain for Tata Power-DDL has been illustrated in **Figure 1.4**. The business of Tata Power-DDL is governed by the provisions of the license issued by Delhi Electricity Regulatory Commission (DERC) for

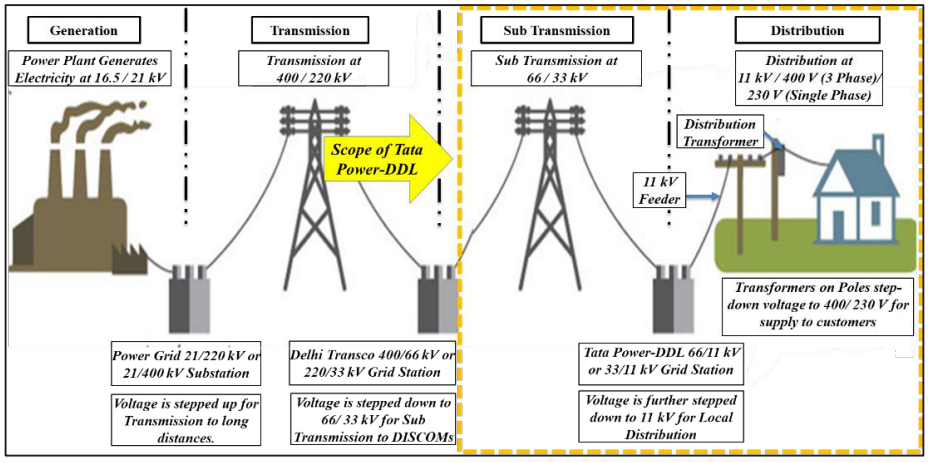


Figure 1.4: Value Chain for Tata Power-DDL

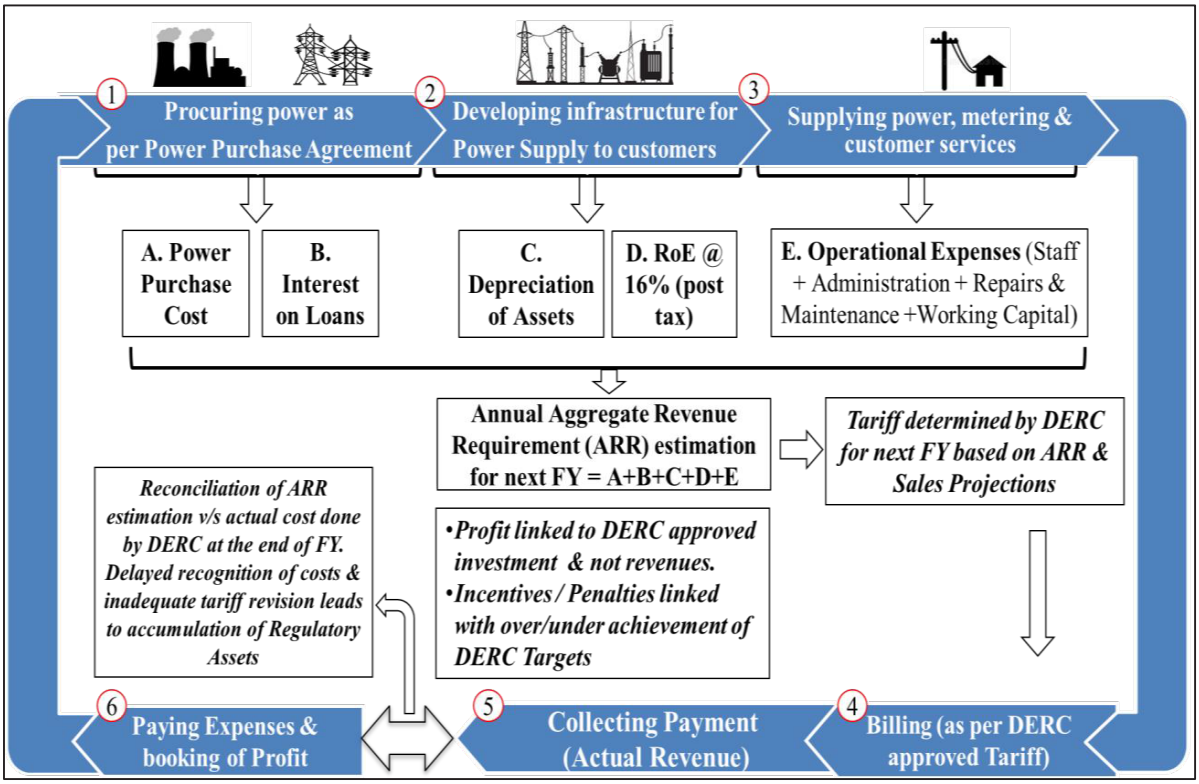


Figure 1.5: Business cum Operating Model for Tata Power-DDL

retail supply of electricity in North & North-West Delhi. DERC regulates the working of the entire power sector of the Delhi State, including determination of tariff chargeable to end customers and establishing performance norms (mainly related to AT&C loss reduction, reliability of power supply and customer service delivery).

The targets are set by DERC after considering the past performance, existing levels, and current operating environment - ground realities and prevailing norms for other power distribution utilities across India. The Business cum Operating model for Tata Power-DDL is depicted in **Figure 1.5**.

The value addition is broadly in activities of power procurement, development of network infrastructure for power supply, network operations & maintenance, revenue cycle management (energy metering, billing, collection) & customer services. The profit is linked with CAPEX approved by DERC and not revenues. Further, there are additional incentives / penalties based on over/ under achievement of targets set by DERC.

1.5. Organisational Structure, Functional Roles, & Workforce Profile

The organisational structure comprises Core, Support & Corporate functions at the corporate level**.** Each function is headed by a Chief/ Head and is further hierarchically divided into departments (headed by Head/ HoD) and groups (headed by HoG) based on specific roles. While functions provide overall policy direction, departments provide an integrated review and monitoring perspective, and groups are where the processes are defined and executed. The Corporate Organisation structure is shown in **Figure 1.6**.

The workforce is an amalgamation of employees from erstwhile state government company - Delhi Vidyut Board (DVB) and new recruits after takeover comprising 3099 employees (as on 1-Feb-24). Management of activities that are manpower intensive and low/ moderate skill such as network maintenance, meter installation & reading, call centre, security, housekeeping, etc. have been contracted to specialized agencies (BA) comprising 5085 BA employees (as on 1-Feb-24). These are governed by 'Performance / SLA based Contracts' along with Safety provisions as per 'Contractor Safety Management System' Tata Power-DDL is an equal opportunity employer and encourages diversity in experience, skills, and background. It primarily recruits at entry levels from various Technical/ Management Institutes across India. Tata Power-DDL has its own Learning & Development Centre for providing training to its employees as well as to personnel of other utilities. The Distribution Operations & Safety Excellence Centre (DOSEC) has been established for imparting technical & safety training to own as well as BA Employees and is certified by the Ministry of Power (Govt. of India).

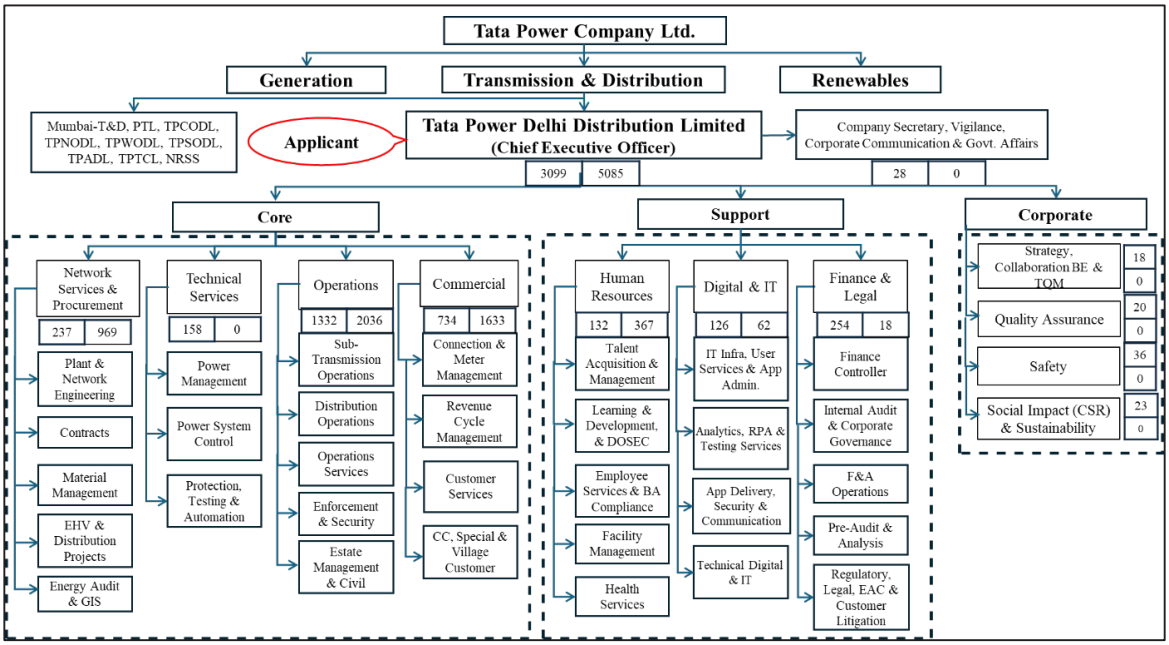
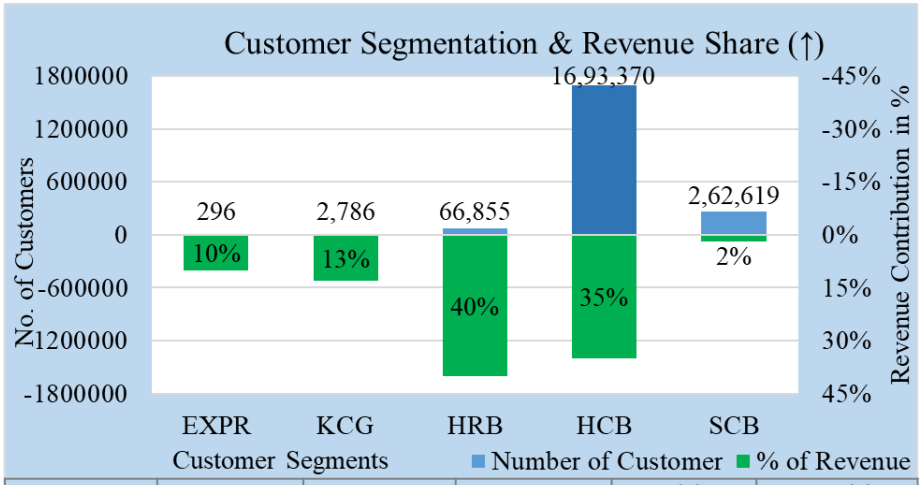


Figure 1.6: Organisation Structure as on 1-Feb-2024

1.6. Product/ Service Offering & Customers of Tata Power-DDL

Electricity is supplied at High Voltage (HV) Level (66 / 33 / 11 kV) primarily to Industrial customers and Low Voltage (LV) Level (400 / 230 Volt) primarily to Residential and Commercial customers. Based on contract load requirement, customers are provided metered connection through electronic / smart meters. The licensed area is divided into 5 Circles, 12 Districts and 31 Zones/ Business Units for ease of operations and execution of field activities. The network operations are centrally monitored and controlled by the Power System Control (PSC) Group from the Technology Centre. The customer services are provided locally through 13 Customer Care Centers located at District level and ease of payment is ensured through company owned collection counters located at about every 3 Sq. KMs. in Urban Areas. All locations are connected online through a private ring-based fiber optic network. Within the licensed area, DERC has defined the tariff and performance standard based on the usage and type of customers viz. Domestic, Commercial, Industrial, Agriculture, Others (DJB, DMRC, Railways etc.). However, Tata Power-DDL's Customer Segmentation **(Figure 1.7)** has evolved over the years to address & cater to the differentiated needs of the customers. Based on emerging customer requirements, new product & service offerings like Roof Top Solar, ESCO, Home Automation, EV charging station etc. are being focused upon.



Customer Segment	Xpress Customer (EXPR)	Key Customer Group (KCG)	High Revenue Base (HRB)	High Customer Base (HCB)	Special Customer Base (SCB)
Contract Load	> 500 kW	101-499 kW	11-100 kW	1-10 kW	1-2 kW
	←Government & Institutional (G&I) →				

Figure 1.7: Customer Segmentation & Revenue Share as on 31st Mar 2024

1.7. Competitive Position and Technology Landscape

Presently, Tata Power-DDL does not face any competition in its area and other two DISCOMs viz., BRPL & BYPL operate in their own licensed areas. However, to be future ready and geared up for any upcoming opportunities in the field of Power Distribution, organisational capabilities are being developed to gain competitive advantage. Accordingly, a "Digital Transformation" Roadmap has been framed for New Service Development. Tata Power-

DDL is exploring new opportunities to replicate its experience of distribution reforms both in India and abroad. It is leveraging its unique value proposition and skillsets in collaboration with leading utilities and technology providers like GE, IBM, Enel, Omron, 3M, Panasonic, AES, Mitsubishi etc. in the areas of communications & smart grid technology, change management, customer service delivery and business process re-engineering. It has also collaborated with leading international institutions to carry out research activities in energy space.

For this purpose, a Smart Grid lab, first of its kind in India, has been established to showcase futuristic technologies as a proof of concept. The company aspires to transform to the next level and be a front runner in implementing the Smart Grid vision in India through the India Smart Grid Forum platform. The Clean Energy International Incubation Centre (CEIIC) has also been setup, as a joint initiative of Tata Trusts and the Government of India supported by Tata Power-DDL and others. The center promotes and aides start-ups working in the field of developing clean energy solutions and provides them with necessary R&D facilities at nominal costs.

1.8. Sustainability & Corporate Social Responsibility (CSR)

Jamsetji Tata, the founder of Tata Group, since the inception emphasized the importance of utilising natural resources efficiently while also ensuring sustainable development for the benefit of society. It was year 1915 when Tata Power commissioned the very first hydroelectric power station at Khopoli in Maharashtra, India which marked the beginning of Tata Power's commitment to clean & green energy production. With the growing sensitivity on the matter, TPC set he sustainability objectives to become (a) Carbon Net Zero by 2045; (b) Zero Waste to Landfill by 2030 and (c) Water Neutral by 2030. Accordingly, Tata Power-DDL aligned with Vision of TPC & is committed to introduce energy efficient and greener technologies. We have collaborated with the Energy Efficiency Services Limited (EESL) – a joint venture of Public Sector Undertakings under Ministry of Power-India, to promote Energy Efficient schemes such as LED & energy efficient fan distribution, Air Conditioner replacement etc. for all customers in its licensed area. A special program on Behavioural Demand Response (BDR) is in place to further engage with customers and empower them to play a pivotal role in reducing electricity usage during peak periods upto 500 MW.

Further Tata Power-DDL, has been reaching out to the communities it serves and has been consistently strengthening and empowering the underprivileged through its focused CSR Program – SAATHI *(meaning partner in development)*. This program targets people residing in over 223 slum clusters in its area of operation covering a customer base of approx. 260,000. Under the umbrella of SAATHI, several initiatives like Women Literacy Centers, Vocational Training Centers, Tutorials, Medical Camps, drug de-addiction camps & energy conservation have been undertaken **(Figure 1.8)**.

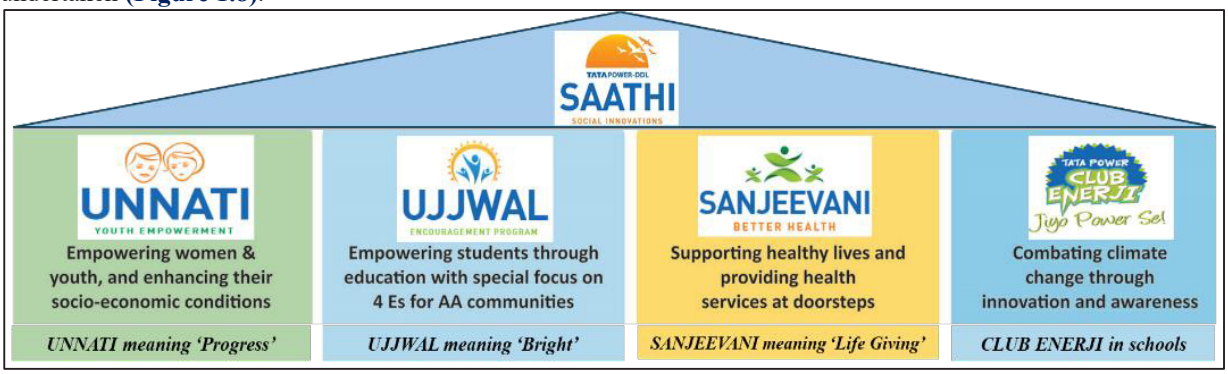


Figure 1.8: SAATHI (*meaning partner*) CSR Framework at Tata Power-DDL

1.9. Quality Certifications

In its excellence journey, Tata Power-DDL has developed managements systems aligned with International Standards and is certified for ISO 9001 (Quality Management Systems), ISO 14001 (Environmental Management Systems), ISO 45001 (Occupational Health and Safety), ISO 22301(Security and Resilience), ISO 27001 (Information Security Management), ISO 31000 (Risk Management) and ISO 50001 (Energy Management Systems) certified company. Tata Power-DDL is also certified for the unaccredited standards of ISO 10002 (Customer Satisfaction - Guidelines for Complaints Handling) and ISO 20400 (Sustainable Procurement).

1.10. Key Awards & Recognition

Tata Power-DDL has been recognised from all quarters – the government, the corporate fraternity, the domestic & global agencies for change management experience, operational performance, adoption of latest technology, people development process, customers services, & innovative & open work culture. Some of the recent ones are Voice of Customer Impact Award in Power Distribution Sector (by SAP) & Top 50 Innovative Companies Award (by CII).

2 BUSINESS OBJECTIVES AND STRATEGIES

2.1 Background

Tata Power-DDL's annual planning cycle is aligned with the parent company, Tata Power Company (TPC), which sets the future direction and forms the basis for formulation of Tata Power-DDL's Vision & Mission. The Long Term & Mid Term Goals are further derived from the Organisation's Vision & Mission which form the basis of Annual Business Objectives & Strategies. The Vision & Misson were revisited in FY 2023-24 to incorporate the inputs received during TQM Diagnosis 2022 & focus on emerging areas such as sustainability, innovation, etc. **(Table 2.1).**

Table 2.1: Linkage with Vision-Mission-Values of Tata Power Company (Parent)

Company	Tata Power Company	Tata Power-DDL	Key Business Objectives linked with Mission
Vision	Empower a billion lives through **sustainable**, affordable and **innovative energy solutions.**	Be a **benchmark** power **utility** providing **sustainable, affordable, and innovative** energy solutions	
Mission	• Keeping the **customer at the center** of all we do • Operating assets and executing projects at **benchmark level** through **technology & innovation** • Sustainable growth with a focus on profitability and market leadership • Creating an **empowered workforce** driven by passion & purpose • 'Leadership with Care' for all stakeholders	• Keep the **customer at the center** of all we do • **Embed safety and sustainability** in every aspect of our business • Create **new benchmarks** through **technology leadership, innovation & continuous improvement** • Empower **teams** which are driven by **passion & purpose** • Support the **development of communities** we work in	1. Enhance Customer Satisfaction - CSI 2. Improve reliability - SAIFI, SAIDI, Customer Complaints 3. Reduce AT&C Loss 4. Ensure Zero Harm – LTIFR 5. Enhance Workforce Engagement – EEI 6. Empower Community – CSR Effectiveness
Values	Safety, Care, Agility, Learning, Ethics		

2.2 Need for TQM

Over the period of 15 years (Pre-TQM period), Tata Power-DDL charted a successful turnaround story with unprecedented reduction in AT&C Loss and improvement in Reliability of Power Supply. Going forward, based on Dr. Kano's philosophy of "Vision & Leadership drive people to Sweat for Quality (VLSQ)", the aspiration was to become a benchmark Organisation in Power Distribution Sector (considering companies with similar distribution infra & regulatory environment). For this purpose, the Top Management Team deliberated and identified the following objectives for becoming a benchmark utility:

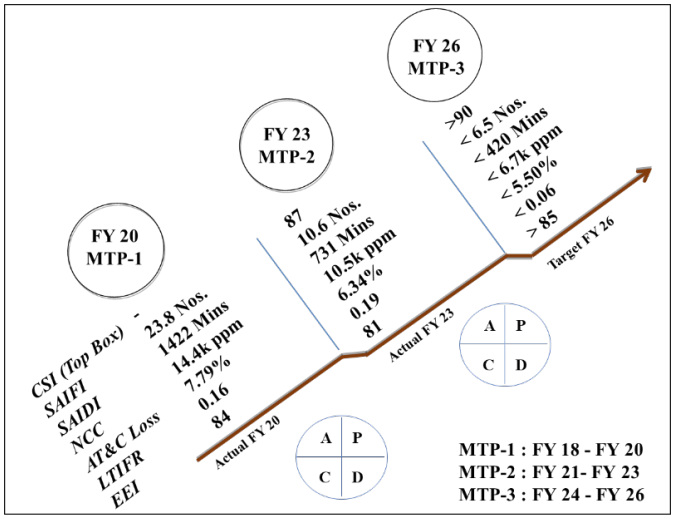


Figure 2.1: Long term Goals

- Imbibing a Customer centric culture across the Organisation for enhancing Customer Satisfaction.
- Improving Reliability of Power Supply to world class standards with optimal resources.
- Enhancing the level of quality to achieve Zero Defects in key business processes such as No Current Complaints & Commercial Complaints about
- Sustaining and further reducing the AT&C Loss comparable to best-in- class utilities.
- Promoting behavioral Safety amongst employees.
- Ensuring a company wide effort by involving & engaging all employees in achieving the Organisational objectives.

2.3 MTP-1 (FY18-FY20) Focus Areas & Learnings

MTP-1 included the customer driven objectives of improving reliability & community service by strengthening the culture of innovation, analytical thinking and safe work practices. Based on the performance analysis of MTP-1, it was recognized that there were following remaining problems still to be solved:

- While incremental improvement was achieved, there was scope of further reduction of SAIFI, SAIDI and AT&C loss which were still on higher side as compared to the values of other national / international Distribution companies.
- No significant reduction in Customer Complaints.
- Non-compliances & behavioural issues still being observed in adherence of Safety processes & SOPs.
- Liquidation of Regulatory Asset (RA) that increased to ₹ 5222 Crs. (USD 626 million) in FY20, affecting company's cash flow.

2.4 MTP-2 (FY 21-FY23)

2.4.1 Business Environment for FY21-FY23

Tata Power-DDL's business is governed by the provisions of the license issued by Delhi Electricity Regulatory Commission (DERC) for distribution and retail supply of electricity in North & Northwest Delhi. DERC regulates the working of the Power distribution in the entire Delhi state, including determination of tariff chargeable to end customer and establishing performance norms. The targets are set by DERC after considering the past performance, existing levels, and current operating environment - ground realities and prevailing norms for other power distribution utilities across India.

2.4.2 Business Objectives and Strategies and Key Learnings

Based on the performance reflection of MTP-1, changing Customer requirements, and Business environment scanning, the Business Objectives and Strategies for MTP-2 were formulated with focus on the following parameters:

- Enhancing Customer Satisfaction with CSI (Top Box) and Reduction in Customer Complaints
- Attaining continued reduction in SAIFI
- Reducing AT&C loss level
- Maintaining profitability by achieving positive Cash flow & reducing the Regulatory Asset
- Building a Safe and zero harm work culture
- Engaging the society through Corporate Social Responsibility (CSR) initiatives and empowering beneficiaries in our licensed area

Table 2.2: Business Objectives & Strategies for MTP-2

Corporate Business Objective	MP / UoM / Good Direction	Strategies	CP / UoM / Good Direction
Enhance Customer Satisfaction	CSI-Top Box / Index / (↑)	Enhance Customer Satisfaction in HCB segment	CSI-HCB / Index / (↑)
Enhance Customer Satisfaction	Customer Complaints / PPM / (↓)	Reduce Operational Complaints	NCC / PPM / (↓)
		Reduce Commercial Complaints	Commercial` Complaints / PPM / (↓)
Improve Reliability of Power Supply	SAIFI / Nos. / (↓)	Reduce unscheduled interruptions in DTS	Unscheduled SAIFI – DTS/ Nos./ (↓)
		Reduce unscheduled interruptions in STS	Unscheduled SAIFI – STS / Nos. / (↓)
Reduce revenue loss across all customer segments	AT&C loss / % / (↓)	Enhance Billing Efficiency	Billing Efficiency / % / (↑)
Maintain profitability, attain cost reflective tariff, and ensure positive cash flow	Cash Flow / ₹ Crs. / (↑)	Achieve optimized level of CAPEX	CAPEX cost / ₹ Crs. / (↓)
		Maintain profitability & Maximise return	PAT/ ₹ Crs. / (↑)
	Regulatory Asset / ₹ Crs. / (↓)	Achieve optimized level of PPC through advocacy	PPC (₹ / Unit) / (↓)
		Policy Advocacy for cost reflective Tariff	Increase in effective Tariff / % / (↑)
Strengthen Zero Harm culture	LTIFR / Nos. / (↓)	Improve operational safety practices with proactive measures	Safety Index Score / % / (↑)
Empower beneficiaries in licensed area	CSR Beneficiaries / Nos. Million / (↑)	Enhance Community welfare & social upliftment through Unnati (Employability) & Sanjeevani (Health) Programs	Unnati Beneficiaries / Nos. Million / (↑)
			Sanjeevani Beneficiaries / Nos. Million/ (↑)

2.4.3 Key Learnings and Remaining Challenges from MTP-2

Based on the performance analysis of MTP-2, the learnings were derived for further focus in MTP-3:

Table 2.3: Snapshot of Key Learnings from MTP-2

Corporate Business Objective	MP	CP	Major Causes of Variation	Key Learnings	Inputs for MTP-3
Enhance Customer Satisfaction	Customer Complaints	NCC	NCC cluster selection methodology was not sufficient to achieve the NCC targets	Strategy of cluster selection was required to be changed.	PM Ph-II High NCC DTs were selected instead of NCC clusters.
Improve Reliability of Power Supply	SAIFI	Unscheduled SAIFI - DTS	•Delay in budget led to delay in execution of Ph-3 (PM30 feeders) projects •Cable Faults by external agencies	Planning and budget approval for timely material availability for scheme execution to be improved	Timely planning & execution of projects in next phase. Further stretch in target to reach closer to the national level benchmark.
Maintain profitability, attain cost reflective tariff, and ensure positive cash flow	Regulatory Asset	Power Purchase Cost (PPC)	Impact due to imported coal blending & increase in Gas prices of Delhi GENCOs	Gaps due to uncontrollable factors, hence advocacy with government and regulator is to be continued	Based on the past performance, the recognition and liquidation of Regulatory asset is still an area to focus along with maintaining a positive cash flow
		Tariff Hike	Tariff Order for FY23 not released by DERC		

2.5 MTP-3

2.5.1 Business Environment for FY24-FY26

Indian power sector has been evolving with increased focus from government on cleaner energy and having a reliable and resilient network. The sector is also witnessing more stringent rules and regulations from the government such as strict penalty mechanisms, and rights of Customer rules. Further, disruption through new technology and digital transformation, smart grids, data analytics etc. shall have an important role to play in future. **i.e**., increased focus on green energy with government declaring higher targets for Renewable Purchase Obligation (RPO) paves a way for sustainable business operations. At the same time, the challenges faced by the new Business Plan Regulations by the regulator, non-issuance of Tariff Order and the continued high-power purchase costs is a challenge and have an adverse impact on the financial performance. Further, the Voice of Customer is an input for further improvement in operational parameters leading to improved Customer Satisfaction Index.

The change in business environment has helped in identification of new areas of opportunities taking inputs from a) Government's push for increasing Green Energy Share, b) Benchmarking with other discoms, c) Voice of Customers, d) PDCA of past performance, and also the threats, critical ones being- 1) Imported Coal blending by Power Generating Stations, 2) Increased Gas Prices/ Fuel Prices, 3) New Business Plan Regulations (BPR) by DERC and 4) Cyber Security. All these were considered while defining our next mid-term plan i.e., for FY24-FY26.

2.5.2 Formulation of Mid-Term Plan-3 for FY24-FY26

Tata Power-DDL MTP-3 for FY24-FY26 – 'Lakshya 2026' was formulated, in alignment with the strategic challenges and learnings from MTP-2. It covers all the key stakeholders of our business – Customers, Society, Shareholders, and Employees. The key changes incorporated in MTP-3 are as follows:

1. Challenging objectives of improving Customer Satisfaction Index, SAIFI, SAIDI, AT&C loss, Customer Complaints, Regulatory Asset and Positive Cashflow were continued from MTP-2 with a further stretch in targets.
2. New challenging objectives for improving Customer Effort Score, Power Quality (voltage) complaints were taken up.
3. For imparting greater focus on Sustainability aspects, new objectives were formulated for enhancing Clean & Green Energy share, reducing the carbon emissions, engaging with customers for Demand Side Management and measuring the effectiveness of CSR initiatives.
4. For base building, objectives of strengthening the culture of Safety and enhancing Workforce Engagement were continued from MTP-2. Further, new objectives were introduced to impart greater focus on Quality, Occupational Health, Digital Transformation & Innovation.

A truncated version of the Corporate Business Objectives and Strategies for MTP-3 along with the 3-year targets is depicted in **Table2.4:**

Table 2.4: Business Objectives & Strategies for MTP-3 (FY24-FY26) (Truncated)		
Corporate Business Objectives	**MP/ UoM/ Good Direction**	**Key Strategies**
Enhance Customer Satisfaction	CSI-Top Box / Index / (↑)	Enhance Customer Satisfaction in HCB segment
	Customer Complaints / PPM / (↓)	- Reduce Operational Complaints - Reduce Commercial Complaints
	Voltage Complaints- Exp & KCG/ Nos./ (↓)	Reduce Voltage Complaints attributable to Tata Power-DDL
Improve Reliability of Power Supply	SAIFI / Nos. / (↓)	Reduce unscheduled interruptions in DTS
Reduce revenue loss across all customer segments	AT&C Loss / % / (↓)	Enhance Billing Efficiency
Strengthen Zero Harm culture	LTIFR / Nos. / (↓)	Mitigate risk of Fall from Height & Electrical Flash
Enhance employee engagement and experience	Employee Engagement Index / Index / (↑)	Ensure effective deployment of People practices in all functions
Maintain profitability, attain cost reflective tariff, and ensure positive cash flow	Regulatory Asset / ₹ Crs. / (↓)	Policy Advocacy for cost reflective Tariff
		Power Purchase Cost optimisation
	Cash Flow / ₹ Crs. / (↑)	Maintain profitability & Maximise return
Enhance impact of CSR programs	CSR Effectiveness Index / % / (↑)	Enhance effectiveness of education, employability, and empowerment programs
Reduce Carbon Emissions	Scope 1 Emission / tCO2e / (↓)	Reduce Fugitive Emissions

3 TQM PROMOTION

3.1 TQM Adoption Journey & Need

Prior to initiation of TQM journey, Tata Power-DDL strived continuously for quality improvement over the period of 15 years & developed management systems aligned with the ISO Standards which were certified through accreditation agencies **(Refer Section 1.9)**. Thereafter, the TQM adoption journey began with formulation of MTP-1 & need for TQM promotion was identified for developing an organisational culture towards:

i) Strengthening Customer Centricity across organisation
ii) Organisation wide efforts & Total Employee Involvement for achieving long term aspirational goals.
iii) Structured Problem Solving at all levels.

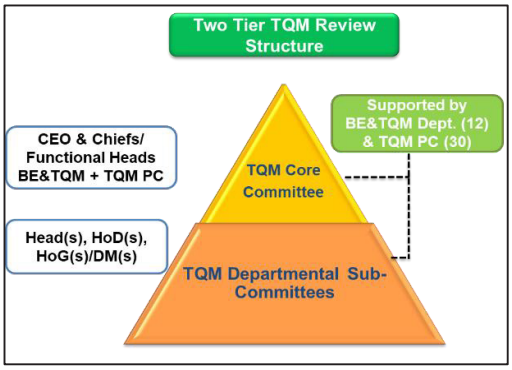


Figure 3.1: TQM Review Structure

In order to imbibe TQM culture till the grass root level, TQM Review Structure was institutionalised (**Figure 3.1**). It comprised the TQM Core Committee, TQM Promotion Council and Local Quality & Safety Committee (LQSC) at field level.

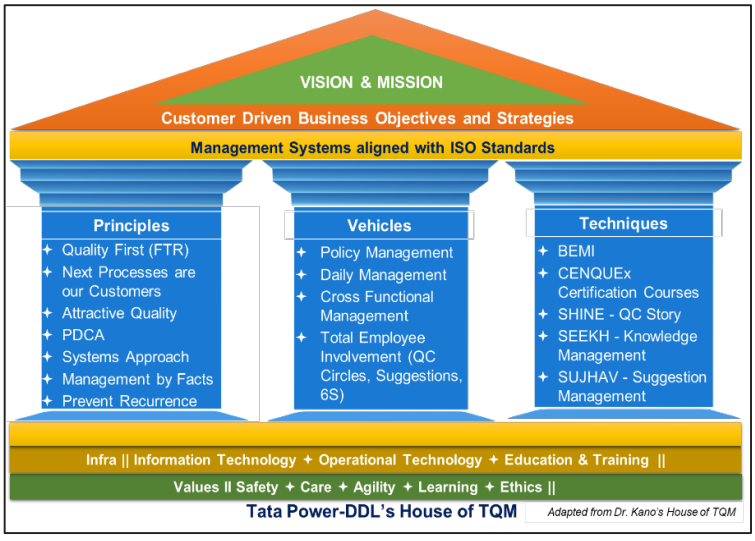


Figure 3.2: Tata Power-DDL's House of TQM

The erstwhile Business Excellence Group was renamed as BE&TQM Department for promoting the TQM initiatives & strengthened from 3 to 12 members as of 31 Mar '24. As a first step, the "House of TQM" was formulated with guidance from Dr. Kano to define the way of TQM adoption at Tata Power-DDL (**Figure 3.2**). Thereafter, the frameworks for driving TQM through the Vehicles were developed for deployment across all levels. To enhance the employee involvement, special roles of TQM Samurais were developed as champions for driving the initiatives at group level and TQM Sensei were developed at Functional level to guide them and oversee the overall progress.

3.2 TQM Vehicles

3.2.1 Policy Management

As part of its annual Policy Management Process **(Figure 3.3),** Tata Power-DDL does environmental scanning (internal & external) which helps in identification of key opportunities and threats emerging out of the changing business environment. Corporate Scorecard is developed and dovetailed further into functional Scorecards and MPs / CPs, as part of Policy deployment. Prior to TQM adoption, Tata Power-DDL followed the Balanced Scorecard Approach which primarily focuses on "Management by objectives". Subsequently, the methodology has been changed and the TQM approach of "Management by objectives with specific means" for achievement of business objectives using the Policy Management Framework has been adopted.

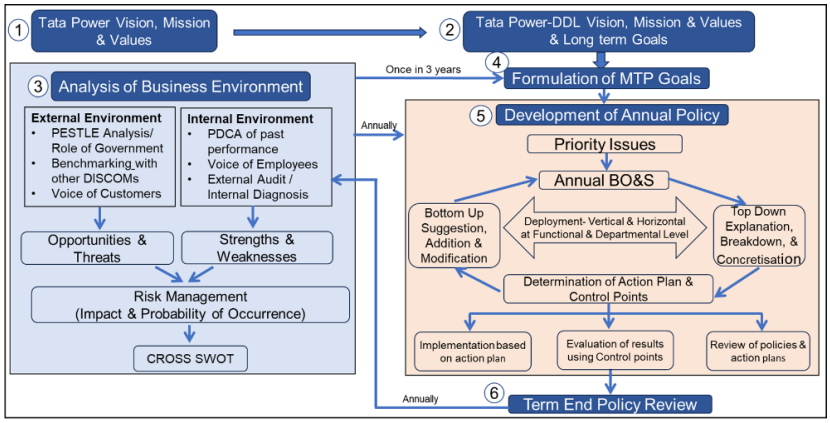


Figure 3.3: Policy Management Framework

3.2.2 Daily Management (DM)

DM adoption started in FY 20 with an objective to establish daily management over key performance Indicators and to sustain the improvements achieved through Policy Management. Initially, one critical IMS process from each group and from that process, the most critical MP and associated CPs were identified on a pilot basis for learning. The main objective was to standardize & stabilize one key process for each group and thereafter scale-up to other processes based on learnings. However, during TQM Diagnosis it was learnt that to derive the true benefit of this methodology, the adoption has to be scaled up across all groups. Accordingly, post TQM Diagnosis, the DM framework was revised and is depicted in **Figure 3.4.**

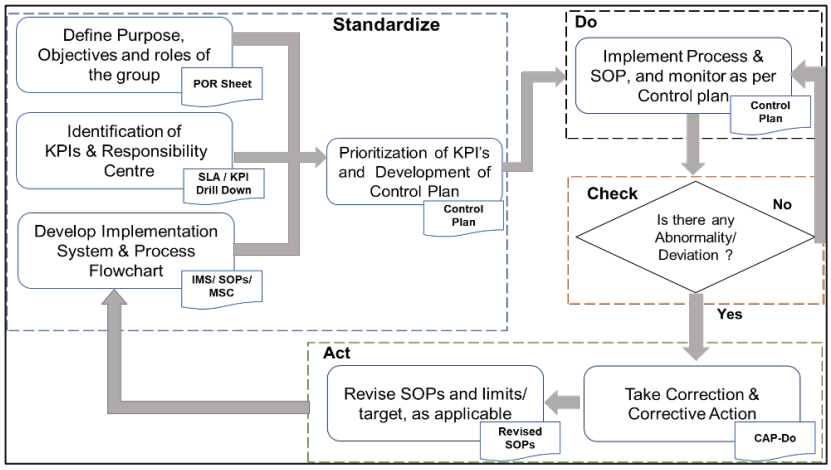


Figure 3.4: Daily Management Framework

DM Adoption & Review: Based on learnings from TQM Diagnosis, DMQIP document was formulated & shared across all groups as standardized approach towards DM adoption. Further, to improve process performance and achieve process stability and conformity, all groups were educated on abnormality management by "CAP-Do" approach.

3.2.3 Cross Functional Management (CFM)

CFM has been initiated at Tata Power-DDL to strengthen inter-functional coordination between different functions/ departments and bring about integration towards achieving the organisational objectives. Quality Assurance (QA), Safety, Cost & Sustainability are major focus areas for CFM as of now. **Figure 3.5** shows the framework for implementation of CFM for resolution of cross functional issues at Tata Power-DDL.

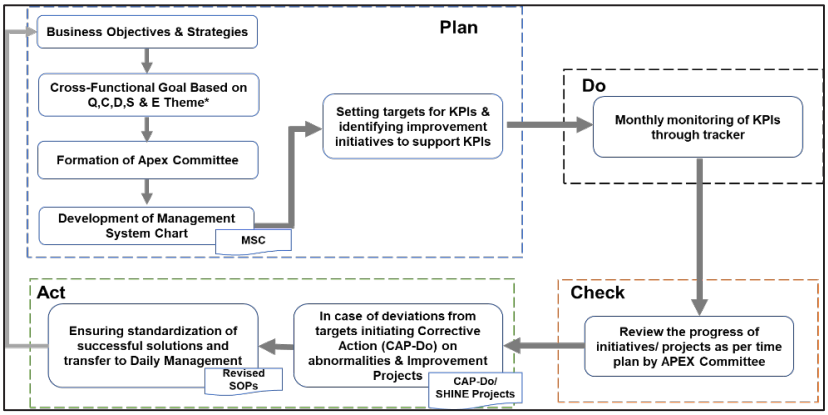


Figure 3.5: Cross Functional Management Framework

3.2.4 Total Employee Involvement (TEI)

The Total Employee Involvement framework is a systematic approach of Tata Power-DDL (**Figure 3.6**) which encourages & supports workforce to identify improvement opportunities. This framework aims to drive progress and excellence through platforms like **6S (5S + Safety), SUJHAV / Tata Ideas, SHINE, Innovation Council, InnoWar, Tata InnoVista, Gyan Sangam & Tata EDGE.** Further details are shared under the next section. By virtue of these initiatives, the unique employee participation in improvement projects has increased from 41% in FY 17 to 90% in FY 24.

Framework / Employee segmentation	Workplace improvement	Problem solving	
		Challenge posting & Idea generation	Project Execution
	6S (5S + Safety)	SUJHAV	SHINE
Sr. Management (DGM & above)	# Mentoring on adoption of 6S practices and Genba audits to review the status.	# Challenge posting for "SUJHAV". # Evaluation & selection of best entries for implementation.	# Mentoring of EUREKA, LEAP & SPARK Projects. # Encourage team members for adoption of QC Circles for problem solving.
Middle Management (Sr. Manager ~ AGM)	# Training of team members for 6S adoption. # Gap identification & standardisation for 4S~6S.	# Identification of problem/challenges. # Encourage team members for Idea generation.	# Participation in EUREKA, LEAP & SPARK Projects. # Mentoring of QC Circle Projects - Pragati & Prayaas.
Jr. Management (Exe. ~ Mgr.)	# Implementation of 6S and encourage team members for adoption of first 3S.	# Participation in eHackathon for idea generation.	# Participation in projects including SPARK & LEAP and leading QC Circle projects - Pragati & Prayaas.
Supervisor (Asst. Officer ~ Sr. officer)	# Implementation of 3S.		# Participation through QC Circle projects - Pragati & Prayaas.
New Entrants			
Workmen (Technician ~ Sr. technician) & BA employee		Participation in idea generation- Single page format.	
IT Platform	6S Application	TATA Ideas	Shinergy
KPIs	6S Maturity Index	Nos. of SUJHAV	SHINE Score

Figure 3.6: Total Employee Involvement Framework

3.3 TQM Techniques

3.3.1 Business Excellence Maturity Index (BEMI) Framework

At Tata Power-DDL, with adoption of frameworks like Total Quality Management (TQM), Tata Business Excellence Model (TBEM) and ISO Standards, the goal for a well-executed operational excellence strategy has been defined as a way to exceed customer expectations through improving business processes and culture.

However, there was a need for a mechanism to capture employee engagement under each initiative at holistic level, to be able to imbibe a process driven quality culture in the organisation. Hence, taking this as a trigger and following the approach of PDCA Cycle, the framework of BEMI was introduced in 2016-17 (**Figure 3.7**). Since then, the overall compliance to the framework is being tracked through a comprehensive scorecard.

This scorecard is uniformly applicable across all functions of the organisation, with 100% employee coverage. With 80 BEMI Groups, the first year of roll out of BEMI witnessed a companywide score of 57%. For first 3 years, BEMI Score continued to be monitored manually through consolidation of employee participation (under defined parameters) with communication of scores on half-yearly basis. Subsequently, an integrated portal was launched in FY19 to track real-time employee engagement. This led to 63% increase in companywide scores with weighted average BEMI being 89% in FY 24 (Refer Overall effects **Figure 6.9**). Based on the learnings of previous year, the evaluation criteria for each element of BEMI is reviewed & revised on an annual basis.

Figure 3.7: BEMI Framework

3.3.2 Education & Training (CENQUEx Certification Courses)

In our journey towards achieving excellence through TQM adoption, it was necessary for employees to thoroughly understand & learn the various aspects of Quality. Initially, the trainings were being provided at Tata Power-DDL's learning centre with other regular programs. During FY 19 to FY 21, 100% employees (on roll & contract) were provided with basic training on TQM awareness and selected employees were provided in depth training on advanced TQM Tools & Techniques. Thereafter, in order to strengthen the Quality Culture & enhance awareness towards TQM, a dedicated Centre for Quality Excellence (CENQUEx) was developed in FY 21 under the aegis of BE &TQM Department. At first, the key focus areas identified were development of Internal Faculties through rain-The-Trainer concept, focused training of TQM Samurais, Refresher training of Own & BA Employees & ensuring effectiveness through robust monitoring.

Cadre	Level-1	Level-2	Level-3
DGM & Above	1. Basics of TQM Concepts & Its Vehicles - PM, DM, CFM, TEI (including QC Circles) 2. Principles of Policy Management & Role of Senior Leadership	1. Development of PM through Internal & External Environment Analysis (reflection of Past - FSM, PESTLE Analysis, SWOT/ Cross SWOT Analysis) 2. Structured Problems Solving through 7 Step QC Story Approach and Basic 7 QC Tools 3. DM through SPC using Control Charts, Stability & Capability Analysis, Abnormality Management, CAP-Do Analysis, Development of 2x2 Matrix	1. Benchmarking for enhancing Business Performance 2. Task Achieving QC Story, 3. Diagnosis at Genba, 4. Use of Advanced Statistical tools– ANOVA, Regression, DoE 5. NPD & NSD Framework
Faculty	External		
TQM Samurai	1. Basics of TQM Concepts & its Vehicles - PM, DM, CFM, TEI (including QC Circles) 2. Overview of TQM adoption Techniques at Tata Power-DDL – BEMI, SHINE, SEEKH, SUJHAV, 6S (5S+Safety)	1. DM through Statistical Process Control using Control Charts, Stability & Capability Analysis, Abnormality Management, CAP-Do Analysis, Development of 2x2 Matrix 2. Structured Problems Solving through 7 Step QC Story Approach and Basic 7 QC Tools 3. Internal Auditor Training on ISO Standards & 6S	1. Task Achieving QC Story 2. Advanced Statistical tools– ANOVA, Regression, DoE 3. Lead Auditor Training for ISO Standards
Faculty	Internal	External	External

Figure 3.8: CENQUEx Certification Course Matrix (Truncated)

However, during the TQM Diagnosis carried out in Sep'22, a major input was received that more focus should be given on Education & Training. Based on the insights gathered from the TQM Diagnosis & teachings of Dr. Ishikawa i.e., "TQM starts and ends with Education", focused Education & Training programs were developed to accelerate the adoption of TQM Practices across the entire Tata Power-DDL workforce (including BA employees). A systematic framework of **'Level-wise Certification Programs on TQM Concepts & its applications'** was introduced which was customised for cadre wise and for three different levels. All participants have to undergo a test at each level and only the Gold & Silver awardees are promoted to next level. A truncated version of the framework for Level-wise Certification Programs on TQM Concepts & its applications is depicted in **Figure 3.8.**

Figure 3.9: Guides for TQM adoption at Tata Power-DDL

Till FY 24, around 1350 on roll employees & 700 BA employees have been covered under these courses. To ensure 100% employee coverage & establish a self-sustaining process, 25 Internal Trainers have been developed in FY 24. Through this training model, the focus is now to institutionalise an in-house capability building system for sustenance & strengthen the culture across the organisation. Further, as a part of the Education & Training initiative, the guides for Tata Power-DDL's way of PM, DM & Improvement Management have been prepared for reference of all employees to enhance their understanding on TQM which were launched by our sensei Dr. Kano **(Figure 3.9)**. In addition to classroom sessions, there are fortnightly webinars conducted through external speakers on TQM vehicles & techniques for wider coverage of audience. In FY 24, eleven webinars were conducted which had an average participation of 300 employees & the offline module was studied by all 1500 employees of executive cadre. By virtue of the Education Training, the improvement Projects under SHINE have increased from 2255 nos. in FY 17 to 3244 in FY 24.

3.3.3 SHINE (Continual Improvement & Innovation)

Tata Power–DDL, in its quest of driving Continual Improvement within the organisation, had introduced the Shinergy application for registering & monitoring of Quality Improvement Projects as well as facilitate creation of a central repository. This was recognized as a unique practice during TQM Diagnosis & there were suggestions for further improvement in problem solving capabilities. Teams with 4 & 5 Star rated projects are nominated for participation in group level innovation platform - Tata InnoVista and regional / national / international level Quality Circle Competitions (CII, CCQC, NCQC, ICQCC).

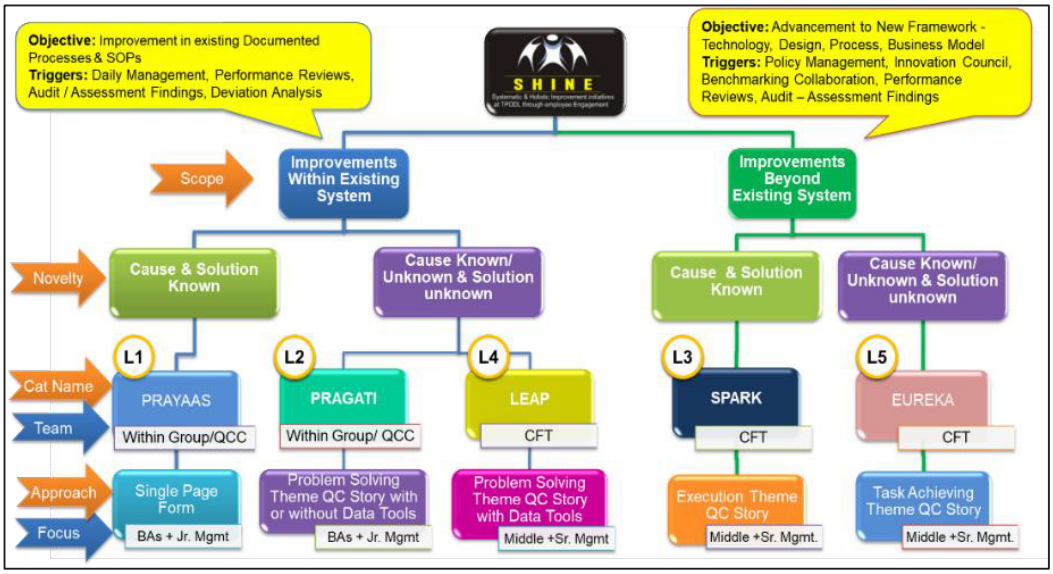


Figure 3.10: SHINE Framework

3.3.4 SEEKH - Knowledge Management (KM) Framework

At Tata Power- DDL "Sanchay" acts as central repository for capturing, sharing, and effectively using Organisation Knowledge for Continual improvement can be accessed by all the employees in the organisation.

Post TQM adoption in FY 20, the framework was revised in accordance to the PDCA philosophy **(Figure 3.11)** & the digitisation of entire process was done with launch of GYAN SANGAM 2.0 application. For horizontal deployment of learnings, Knowledge sharing sessions - "SEEKH" are conducted & documents are stored in online repository for sharing across Knowledge communities. The best practices are identified through high rating "SEEKHs" for further evaluation in Mega SEEKH competition & the winning practices are published on the Tata EDGE portal. This framework facilitates both internal as well as external process benchmarking. The SEEKH sessions have increased from 2258 nos. in FY 17 to 2824 in FY 24 & KM Index (effectiveness measure) has increased from 5.2 in FY 17 to 7.5 in FY 24.

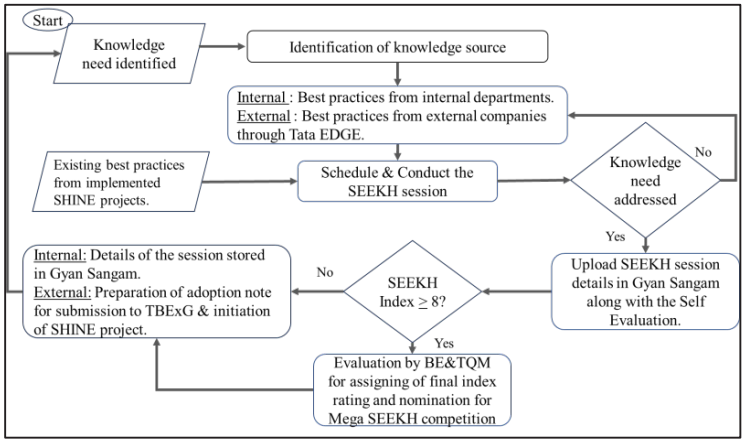


Figure 3.11: SEEKH - KM Framework

3.3.5 SUJHAV - Suggestion Management Scheme

In our journey to promote the culture of improvement, innovation & open idea sharing amongst employees at Tata Power-DDL, a need was felt for an end-to-end system for generating, selecting, & rewarding the most promising ideas. With this objective, "SUJHAV" *(meaning suggestion)* was launched as the Suggestion Management Scheme in FY 23 **(Figure. 3.12).**

The challenges/ problems faced by groups are posted through eHackathon on SUJHAV Portal for inviting ideas from other members within the organisation as well as across Tata Group. All employees can post their "SUJHAV" for improvement against the ehackathons or post any "Blue Sky idea" & get

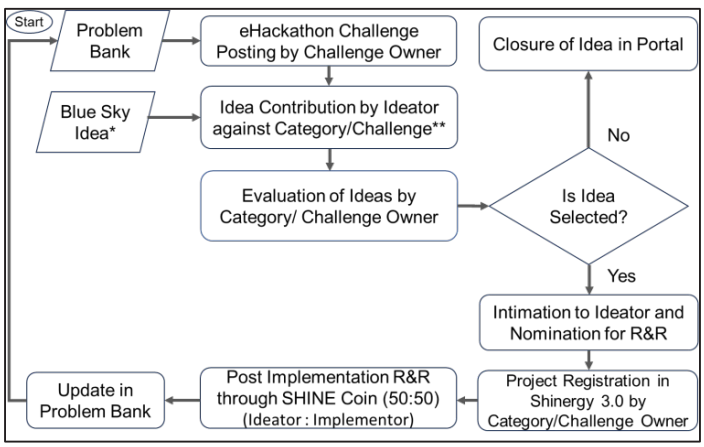


Figure 3.12: SUJHAAV Framework

rewarded for the ones selected by the Category or Challenge owner. The selected ideas after evaluation by challenge owner are implemented & registered as per SHINE Framework in Shinergy application. With Total Employee Involvement, the SUJHAV have increased from 302 in FY 23 to 1541 FY 24.

3.3.6 Reward & Recognition (R&R) Framework for Quality Improvement

Team Awards			Individual Awards		
S. No.	Challenge	Award	S. No.	Employee Category	Award
1	Best performance across all parameters of BEMI	Apex Quality Excellence Award	1	Chief & TQM Sensei	Sagarmatha Quality Award
2	Best 5 Star projects in category - EUREKA, LEAP & SPARK	Arunabha Basu Memorial Award	2	CENQUEx Internal Faculty	Dronacharya Quality Award
3	Best 5 Star projects in Pragati & PRAYAAS	Dr. Ishikawa Award for Kaizen	3	TQM Promotion Council Member	Parthasarthi Quality Award
4	Best demonstration of DM Practices	Dr. Pankaj Kumar Award for Daily Management	4	TQM Samurai	Arjuna Quality Award
5	Best Suggestion for Quality Improvement	Dr. Juran award for Sujhav	5	All On Roll Employees	Quality Maharathi Award
6	Best 6S (5S+Safety) implementation	Taiichi Ohno 6S Excellence Award	6	BA Employees – Linesman, Super visor, Foreman, Skilled	Quality Guru Award
			7	BA Employees – Helpers, Meter Installer, Unskilled	Quality Shishya Award

Figure 3.13: Quality related R&R Framework

Pre-TQM, the R&R was primarily for SHINE Projects. For TQM promotion, a new R&R policy was introduced in FY 20, with an objective to involve the workforce at all levels. Initially, there were just two categories each for On roll & BA employees. In FY 23, employee voices were received voices from TQM Culture survey & Employee Engagement survey to enhance the bouquet of R&R. Consequently, the policy was revamped & there were new set of awards introduced for Individual as well as Teams ((**Figure. 3.13)** with over 1200 awardees in FY 24.

4 PRACTICES OF CHALLENGING STRATEGIES

4.1 Customer Satisfaction Improvement Journey

4.1.1 Understanding the Problem

Customer Satisfaction holds paramount importance at Tata Power-DDL. During the transition from the pre-TQM era to the MTP-1, Customer Satisfaction Index (CSI) for Top-2 Boxes (extremely happy & happy customers) remained constant. In FY 21 and FY 22, we achieved CSI >95 for Top-2 Boxes (96 and 96.8 respectively). Though various initiatives have been taken over the years to improve CSI, which resulted in saturation of CSI (Top-2 Boxes), the decision was made to take a leap forward and to shift the strategy of evaluating & targeting improvement in CSI from "Top-2 Boxes" (score 96.8 – FY 22) to Top Box (Extremely Happy customers - score 81 in FY 22). This prompted a strategic intervention to elevate the existing Top Box score of 81 in FY 22 to 86 in FY 23.

4.1.2 Observation

Upon analysis of CSI (Top Box) across different segments, it was observed that the scores remained consistently high for Xpress, G&I, KCG, and HRB segments. However, HCB & SCB segments Figured lower satisfaction score in the Top Box, indicating the need for focused strategy to enhance Customer Satisfaction in these areas. Scores achieved in all 8 Process Parameters for HCB segment were analyzed.

Thereafter, the Process Parameters (8 Nos.) were checked further at Sub-parameter level (40 Nos.) with reference to the median score & a correlation matrix was prepared to identify the areas of lower satisfaction (**Figure No. 4.1**). Out of the 8 parameters, 'Quality of New Connection Process' parameter was identified as the priority area for further improvement.

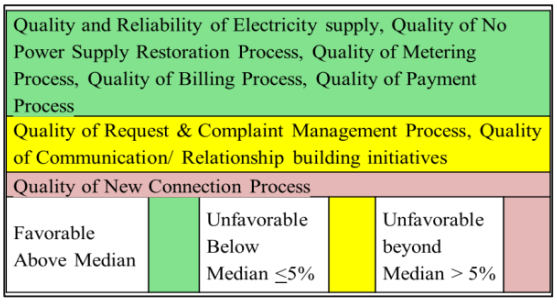


Figure 4.1: Extract of Correlation Matrix for CSI parameters for HCB segment (FY 22)

4.1.3 Analysis

The sub-parameters of the process parameter '**Quality of New Connection Process'** were further analyzed on similar approach of deviation with respect to the median & results**.** Since all sub-parameters showing an unfavorable deviation, the team analysed all of them for identifying the root causes. In this case, the sub-parameter with lowest satisfaction level 'Simplicity of documentation/formalities involved' has been explained in detail. As a next step, new connection registrations data for FY 22 was anlaysed and root causes were identified.

4.1.4 Action

The action plans were developed by cross functional teams to address the identified root causes to improve satisfaction and enhance customer experience. Shared below is the synopsis of key action plans. **(Figure 4.2)**

Factor	Cause validated	Solution Identified	Responsibility & target Date	Implementation Status
Incorrect/Incomplete applied address details as per Ownership proof	Customers were required to fill their address information across multiple fields.	Ease of selecting area drop downs through pin code and Voice assistance to guide	CWG / IT Target Date-Jan'23	Completed by Jan'23
	Character limit was imposed on the address column.	Character limitation increased in address column.		
	Option for mapping the applied floor (e.g., lift or parking) was not available	Provision of drop down in Floor selection - Lift/parking floor options created.		
	Customers were uncertain about the category (purpose of electricity connection) they need to select.	Category selection on front page along with prompts for mandatory document.		

Figure 4.2: Counter measures & Action Plan for New Connection Process FY 22 (Truncated)

4.1.5 Check

On implementation of counter measures, following improvements were observed:

- Demand Note on hold cases were reduced from 47% in FY 22 to 28.2% in FY 23
- Customer satisfaction score against New Connection parameter increased from 65 in FY 22 to 73 in FY 23
- CSI Index of HCB Segment Customers increased from 66 in FY 22 to 73 in FY 23
- For process parameter – "Quality and Reliability of electricity supply", a separate objective was taken to improve reliability of power supply.
- For process parameter – "Quality of No Power Supply restoration process", a separate objective was taken to reduce No Current Complaints.

Consequently, Top Box satisfaction scores improved from 81 in FY 22 to 87 in FY 23. Going ahead, our objective was to achieve a satisfaction level of greater than 90 in FY 24 with focus on HCB segment (catering 80% of total customer base).

4.1.6 Standardisation

The implemented initiatives under this project focus on enhancing customer experience based on their feedback. The modifications have been integrated into the IMS processes of the relevant groups and incorporated into Standard Operating Procedures (SOPs). Alongside, Daily Management is practiced ensuring the timely completion of tasks.

Further, key themes for improvement were identified based on a Prioritization Matrix, which was made basis CSI scores and the significance of eight parameters as rated by customers. This 2X2 matrix was used to assess focused areas with high significance and low scores, based on the guidance received from our sensei Dr. Kano. This led to identification of New Connection/ Attribute Change Process and Complaint/ Request Handling Process as pivotal areas for further improvement (**Figure 4.3**). Based on the learning, In FY 24, CSI Top box calculation in HCB segment is revised in process parameter and loyalty parameter from 50:50 to 70:30. Also in overall CSI Top Box, calculation is revised from earlier 50:50 weightage to 60:40 for Xpress and KCG Segment and 70:30 weightage in remaining segments.

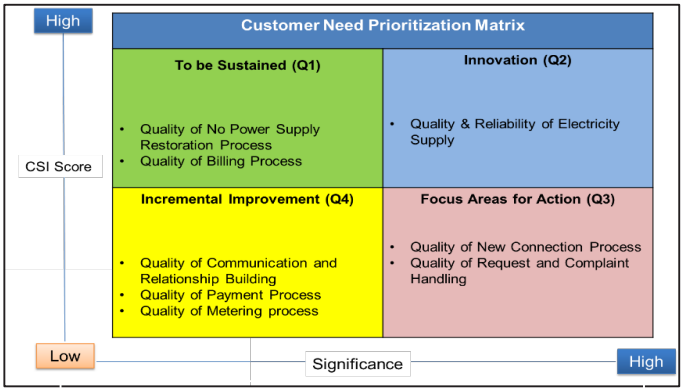


Figure 4.3: 2 x 2 Matrix for identification of focus areas for action in FY24

4.1.7 Conclusion

While CSI is improving consistently every year by virtue of the focused approach, the satisfaction levels of HCB & SCB segments are still low as compared to other segments. Since HCB has the largest customer base, this continues to be the focused segment for the Organisation. To achieve CSI targets in the FY 24, action plans identified using prioritization matrix have been implemented. Further, new metric Customer Effort Score (CES) has been put in place to gauge customer experience based on transactions. In FY 24, CSI score for HCB segment Top Box has increased to 88 with revised 70:30 weightage of process & loyalty parameter while the overall CSI & in Top Box increased to 93 with 60:40 weightage for Xpress & KCG segment & 70:30 weightage in remaining segment.

Consistent focus on embracing TQM methodologies for deeper understanding of customer specific needs have resulted in enhanced customer satisfaction, optimized processes and innovation. This has given the Organisation a competitive advantage towards sustained success & move in the right direction towards achieving the vision.

4.2 Improvement in Billing Efficiency

4.2.1 Background

AT&C Loss is the difference between the electrical units purchased by the DISCOM and the units realized from the customers. It is the single most important factor for any electricity distribution utility and comprises two components, Billing Efficiency & Collection Efficiency as shown in **Figure 4.4**. Tata Power-DDL's Collection Efficiency has continuously been sustained at > 99%. Providing convenient payment options, Pro-active communication, and prediction of likely defaulters through data analytics has helped Tata Power-DDL in collecting >99% of the billed amount. However, scope lies in the improvement of billing efficiency and thus to increase the revenue.

Note: The Feb FY 20 figures have been considered for this case as there was an abnormal increase in Mar '20 due to COVID impact.

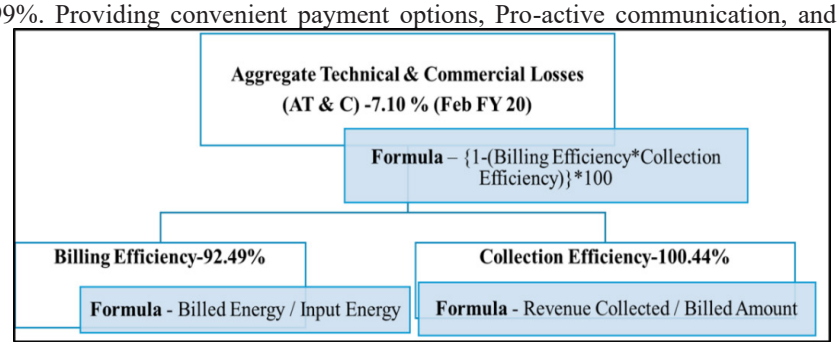


Figure 4.4: Overview of AT & C Losses in Feb FY 20

4.2.2 Define

Tata Power-DDL at time of take over from erstwhile DVB, had opening AT&C Loss of 53.1%. By virtue of multiple initiatives over the years, the AT&C loss has been reduced significantly & brought down to 7.10% in Feb FY20 wherein Billing Efficiency was 92.49% & Collection Efficiency was 100.44%. As part of MTP-2, an ambitious target was taken to reduce the AT&C Loss Level to less than 6.5% and to improve BE to 93.6% by FY23.

4.2.3 Observation

The Billing Efficiency is a combination of technical & commercial losses. From the studies carried out in past, it was observed that technical losses are approx. 53% of the total loss units (395 MUs). As further reduction in technical losses required substantial capital investment, focus was given for the reduction of commercial losses which were 47% (345 MUs). Further, as depicted in **Figure 4.5,** it was observed that 9 zones out of total 31 constitute 66% (230 MUs) loss out the total commercial losses. These 9 Zones were selected for further analysis under the scope of this project.

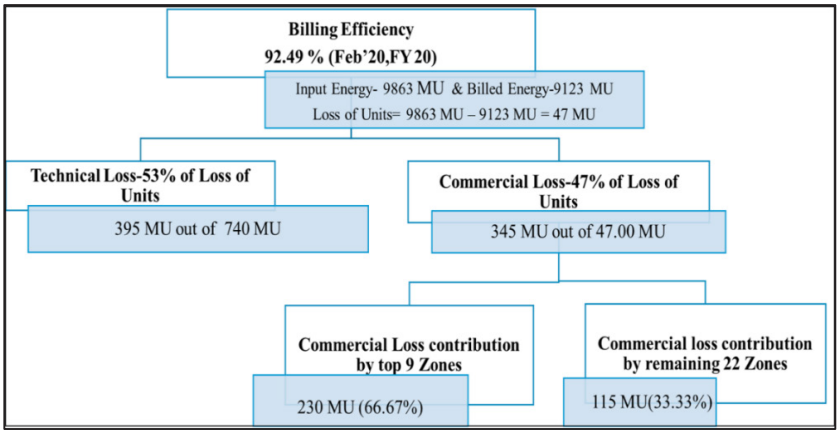


Figure 4.5: Details of Billing Efficiency

4.2.4 Analysis

Reasons for identification of lower BE in selected 9 zones were brainstormed & further validation of these reasons is carried out to decide the action points for improvement of BE in these zones. Furthermore, to validate these possible causes, a 2T test was performed at confidence interval of 95% on different attributes like "theft cases booked per Customer", "penetration of Electromechanical meter per Customer", "percentage of Customers residing in village and non-village areas" and "Average meter aging" for differentiating factors in High loss and Low Loss zones. Factors where P value was less than 0.05 are taken as significant one. It was observed that these 9 zones have high theft through meters (RC1), high theft through direct tapping (RC2), higher proportion of customers living in village areas (RC3) & higher penetration of EM/Counter meters (RC4) when compared to rest of the zones.

4.2.5 Action Plan

A high level of CFT is constituted to formulate the actions in line with the analysis findings. Countermeasures were planned to address the root causes identified based on the results of hypothesis testing, action plan was crafted to address the factors like high electricity theft, high penetration of electrotechnical meters primarily in village areas **(Figure 4.6)**. Some of the activities which were planned is to increase the number of enforcement raids, strengthen the network by installing metallic boxes for avoiding electricity theft.

Sr.No.	Solution Development						Solution Implementation			
	Validated Causes / Proposed Actions	RC.1	RC.2	RC.3	RC.4	TQM Vehicle/ Tool used	Applicability in selected Zones	UoM	FY21	FY22
1	Replacement of Electromechincal Meters/Counter Meters	△	△	○	◎	DM	Applicable to all Zone's except 521	Nos.	1563	3440
2	Enforecement Site Visits	◎	◎	◎	△	DM	Applicable to all	Nos.	4748	6118
3	Theft Cases booked	◎	◎	◎	△	DM	Applicable to all	Nos.	1917	2368
4	Enforecement site Visits done in Category-1 Villages	◎	◎	◎	△	DM	Applicable to all Zone's except 513,521&515&518	Nos.	447	669
5	Enforecement site Visits done in Category-2 Villages	◎	◎	◎	△	DM	Applicable to all Zone's except 514	Nos.	1183	1537
6	Replacement of Tyco Boxes with Metallic Box	△	◎	○	△	Problem Solving QC Story	Applicable to all	Nos.	1203	2620
7	Meters installed outside the premise in SUC during New Connection & meter replacement	◎	△	○	△	Problem Solving QC Story	Applicable to all Zone's except 513, 515+518	%	3166/3517	2393/6570
8	Leads generated RVPE - in House analysis Tool	◎	△	△	△	Task Achieving QC Story	Applicable to all	Nos.		165
9	Load booked using RvPE module	◎	△	△	△	Task Achieving QC Story	Applicable to all	MW		5.29

Figure 4.6: Actions planned for commercial losses reduction in top 9 selected zones

Apart from the above-mentioned initiatives, focus was given to identify electricity theft from smart meter data. Accordingly, to handle and analyze the smart meter data, a Revenue Protection Engine (RvPE) module is developed to out-sort the probable tampered/faulty meters through inbuilt logic based on electrical parameters, consumption patterns, and event data. The actions were monitored monthly at the APEX level on monthly basis.

4.2.6 Check

Both Energy input and energy billed has increased over a period of time, hence loss reduction in MU terms could not be compared. Improvement in BE is taken as a parameter to check the effectiveness of the initiatives undertakenin Action phase. Results for Zone 512 is shown in **Figure 4.7**. The billing efficiency of zones 512 is increased from 59.6% (FY'20) to 68.22 (FY 23).

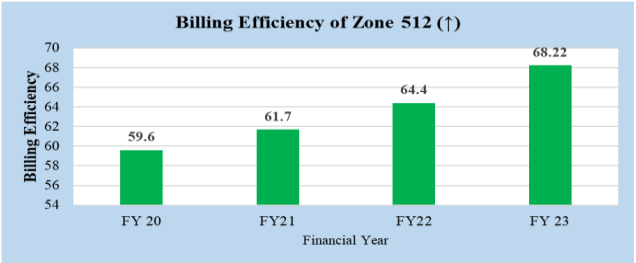


Figure 4.7: Billing Efficiency Trend for Zone 512

4.2.7 Standardisation

- The identified 5 activities have been transferred to DM & scaled up across all other zones.
- RvPE is gradually scaled up across all zones for enhancing the effectiveness of lead generation.

4.2.8 Conclusion

As a result of the improvement in billing Efficiency parameters from the Policy Management **Figure 4.8** the billing efficiency has been improved from 92.49 % in FY 20 to 93.65% FY 23. By this systematic approach, there has been an overall reduction of AT & C loss **(Refer Figure 5.5).** Initiatives where impact on results is not visible were dropped and newer initiatives like identification and replacement of defective meter series were introduced. Going forward, CFT has identified additional initiatives. For further improvement of BE in identified zones as well as in areas and pockets where scope of improvement lies.

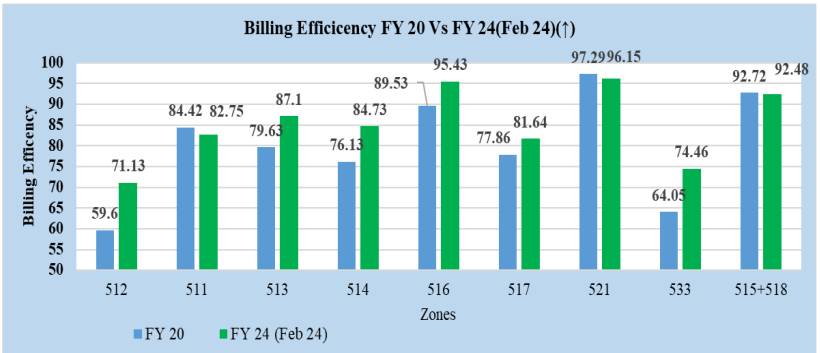


Figure 4.8 Billing Efficiency of 9 Zones FY 20 Vs FY 24 (Dec'23)

4.3 Improving reliability of Power Supply (Unscheduled SAIFI)

4.3.1 Background

Previously, with the conventional KKD approach, a reduction of 15.64% was achieved in SAIFI on YoY basis till FY 20. But with MTP-2, a set of highly ambitious operational excellence goals were taken wherein SAIFI is targeted to be reduced from 20.22 Nos. to 10.55 Nos (47.80% reduction). Accordingly, Unscheduled SAIFI (**Figure 4.9**) was targeted to be reduced from 18.17 Nos. in FY 20 to 6.59 Nos. by FY 24.

Summary of Journey

By virtue of the TQM approach, an overall reduction of 64% has been achieved in Unscheduled SAIFI. The TQM approach taken for the improvement of unscheduled SAIFI 10 Nos. feeders is taken up under policy management as Phase – I in FY 20, shown in detail in section ahead.

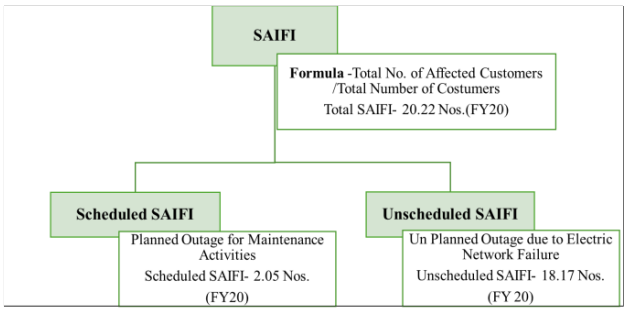


Figure 4.9: Overview of SAIFI

4.3.2 Define

CFT started with analysis of this factor for FY 20 for all 11kV feeders (excluding high AT&C loss feeders). Out of these, top 30 feeders were shortlisted. Based on the past 3-year trends of affected customers in these feeders, in the first phase, it was decided to focus on 10 feeders which were termed as Phase-I Policy Management (PM) Feeders. The target taken for reduction of Unscheduled SAIFI of PM feeders in MTP-2 from 1.30 Nos. (FY 20) to 0.21 Nos. (FY 23)

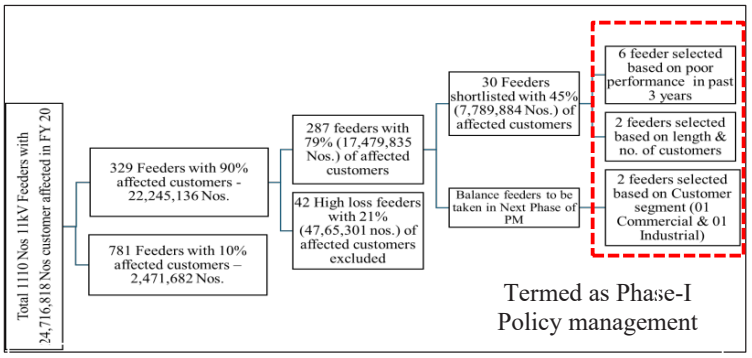


Figure 4.10: Selection methodology for Policy Management Phase-I 10 feeders

4.3.3 Observation

To identify the problematic causes, a deep dive approach was required for all 10 identified feeders. Accordingly, 10 CFTs were formed & an exhaustive analysis was done to identify the causes using a step-by-step approach.

(1) Preparation & study of Single Line Diagram (SLD) – The SLD was prepared for all feeders considering factors such as type of network (O/H, U/G, ABC), customers connected on sections, no. of DTs, their capacities & the points of sectionalisation.

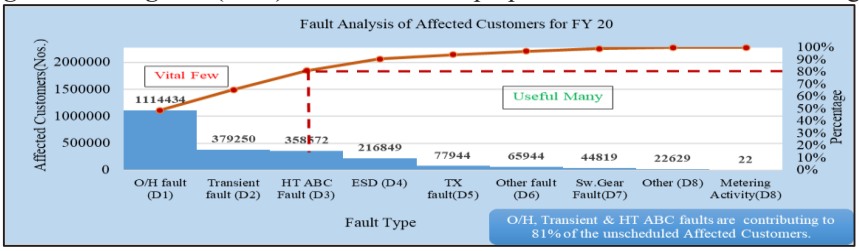


Figure 4.11: Level 1 Fault Analysis

(2) Data Collection & Analysis – Feeder wise Analysis was done to identify the reasons of interruptions for PM10 feeders **(Figure 4.11 ,4.12 & 4.13)**

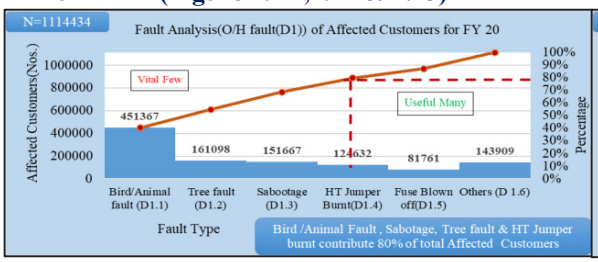


Figure 4.12: Level 2 Fault analysis (O/H fault)

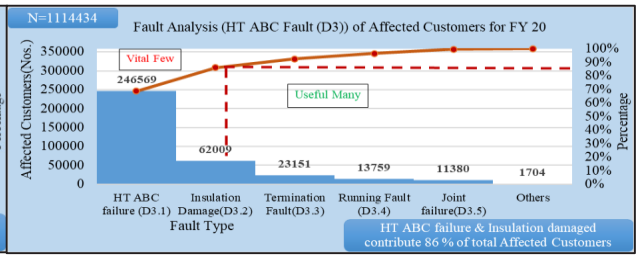


Figure 4.13: Level 2 Fault analysis (HT ABC Fault)

- From Level 1 analysis, the O/H and HT ABC fault type was selected for further analysis.
- From Level 2 analysis, the top 4 contributing factors for O/H faults were identified as Animal/ Bird fault (33%), Tree faults (14%), Sabotage (falling of external object) (14%), and HT Jumper burnt (11%). As sabotage was

beyond team's control, the next 3 factors were considered for further analysis. Similarly, for HT ABC faults, the HT ABC failure (69%) and Insulation damaged (17%) were considered for further analysis.

Note: - ***Transient Faults*** *not taken for analysis as the fault is temporary in nature & their location cannot be ascertained.*

4.3.4 Analysis

Factors identified from Level 2 fault analysis & detailed site (Genba) survey were further analysed. The top contributing defects along with possible causes were mapped with Genba observations to identify the actual cause.

4.3.5 Action

For the causes validated, countermeasures were developed for improving/ upgrading infrastructure/Designing of new Products. (**Figure 4.14**) A sample developed solution has been shown in detail in (**Figure 4.15).** Solutions identified were further scaled up in Feeders and the tracking sheet is developed to track the regular progress of maintenance and implementation of the scheme on the feeder all PM 10.

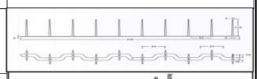
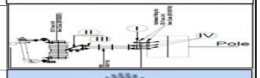
Fault/ Defect Type	Fault/ Defect Code	Causes Validated through Genba Observation	Cause Code	Solution Developed	Solution
Bird /Animal fault	D1.1	Clearance between earth & Un-Insulated Electric Circuit <600 mm	C1	Bird Guard	
				HT Spacer	
				Rodent Disc Barrier	

Figure 4.14: Solutions Developed for each Fault Type (Truncated)

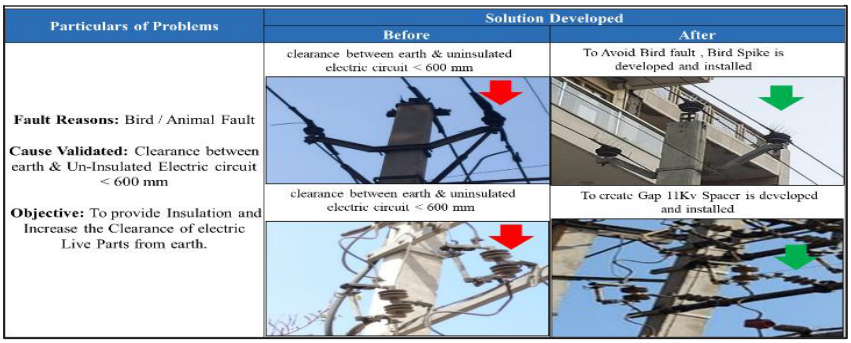


Figure 4.15: Solutions Developed Bird/Animal fault)

4.3.6 Check

All Ph-I PM-10 feeders have shown a substantial improvement with an average reduction of 80% in Unscheduled SAIFI and 80% in Unscheduled SAIDI in FY23 compared to FY21 (**Figure 4.16)**.

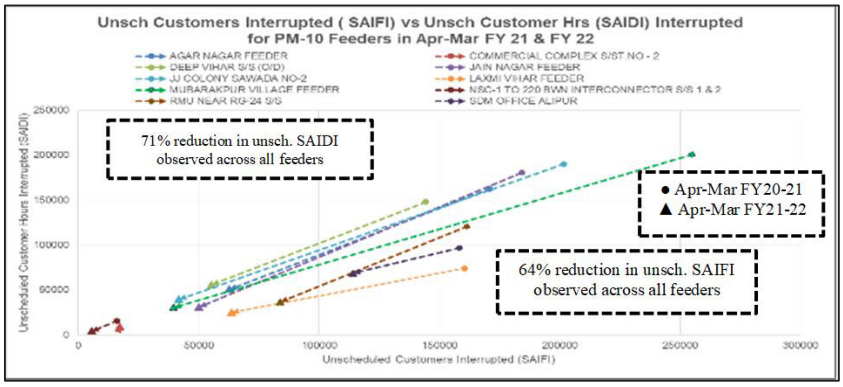


Figure 4.16: Post implementation effects for PM 10 feeders

4.3.7 Standardisation & Transfer to DM

The learnings from Ph-I PM10 Feeders Project are being horizontally deployed and scaled up across other areas. The major activities standardised and incorporated in Daily Management (**Figure 4.17**)

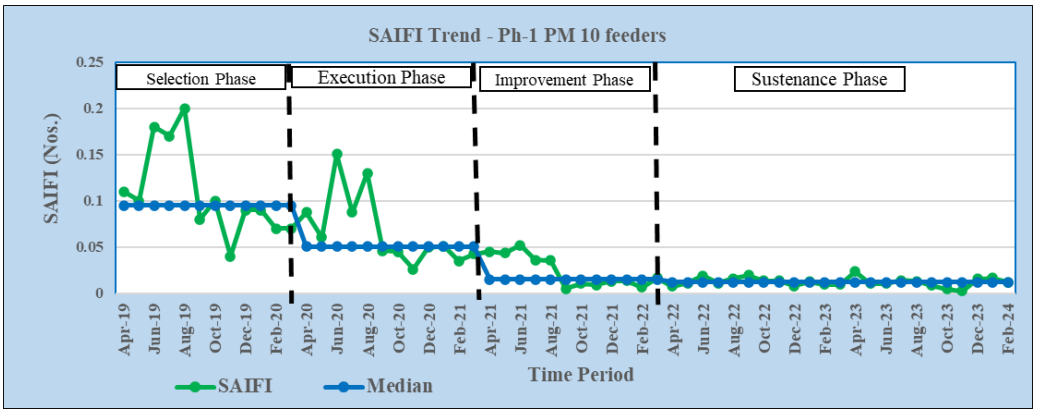


Figure 4.17: Daily Management of PM Feeders

1) Standardisation of solution matrix based on Fault Code & Cause Code wise.
2) SOPs of all operational processes were revised.
3) Standardisation & preparation of specifications for new products, i.e., Bird Spike, Rodent Capacitive Screen Guard etc.
4) Training Modules developed on usage of new products/solutions for reliability improvement.
5) Change in the design of the product based on the feedback and the Gap identification
6) Predictive maintenance through Partial Discharge Scanner (Decibels) & Infrared Thermal Imaging (temperature)

4.3.8 Conclusion

As a result of the improvement in reliability parameters from the Policy Management Phase-I feeders, similar approach was taken in Phase II for 30 Feeders, Phase III for 30 feeders, Phase IV for 40 Feeders & Phase V for 68 Feeders. By this systematic approach, there has been an overall reduction of SAIFI by 55.17% from FY 20 to FY 23 leading to reduction in Unscheduled SAIDI by 48.59% from FY 20 to FY 23.

5 PRACTICES OF BASE BUILDING STRATEGIES

5.1 Building a Zero Harm Culture

5.1.1 Background

At Tata Power DDL, Safety is of paramount importance & creating of "**Zero Harm Culture**" is a key focus area. With initiation of TQM journey, we started putting more focus on different control measures to reduce risk level. Tata Power DDL has a robust Safety Management System which is based on 13 Guiding Elements of Tata Safety & Health Management System (TSHMS for which every year, Annual Safety Plan (ASP) is prepared.

5.1.2 Safety Review Structure of Tata Power-DDL & Management System Chart (MSC)

Tata Power-DDL has 2-tier review structure i.e. (1) Apex Safety Committee which is responsible to formulate policies & procedures while (2) Local Quality & Safety Committee (LQSC) is responsible for implementing these policies & procedures as circulated by Safety department through monthly LQSC Agenda. Structure shown in **Figure 5.1.** Preparation of Safety MSC was an important step in the TQM journey of Tata Power DDL. It serves a visual representation of Tata Power-DDL's Safety Management System, outlining it components, inter-relationships between departments & critical KPIs.

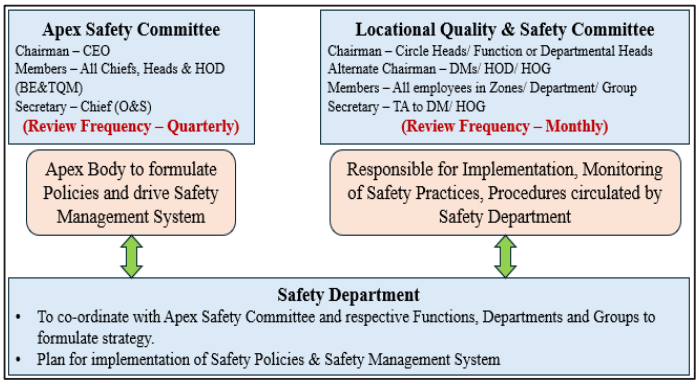


Figure 5.1: Safety Review Structure

5.1.3 Hazard Identification & Risk Assessment (HIRA) & Management

The HIRA process (shown in **Figure 5.2)** involves analyzing past incidents, gathering feedback from user groups & stakeholders through HIRA Workshops. Identified risks are then prioritized using a risk matrix. As advised by TQM Sensei, Tata Power-DDL developed a framework of Risk Mitigation using **SAFETY TRIAD** with an objective to move from Fail Soft to Fail Safe & ultimately to Fool Proof. So, safety team undertook this project for improvement in Ladder design to prevent such incidents.

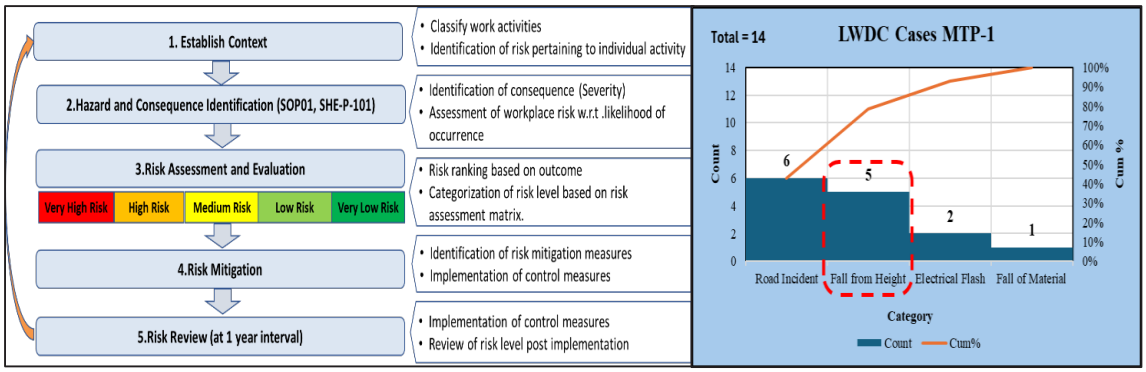


Figure 5.2: HIRA & Management Process/ LWDC Analysis MTP-1

5.1.4 Mitigation of risk – Fall from Height (Ladder)

In Pre-TQM times, Tata Power DDL were using non-standard Bamboo ladders which had many deficiencies like uneven rungs, no anti-skid boot, hard to carry due to length & very less life etc. (Fail Soft Era).

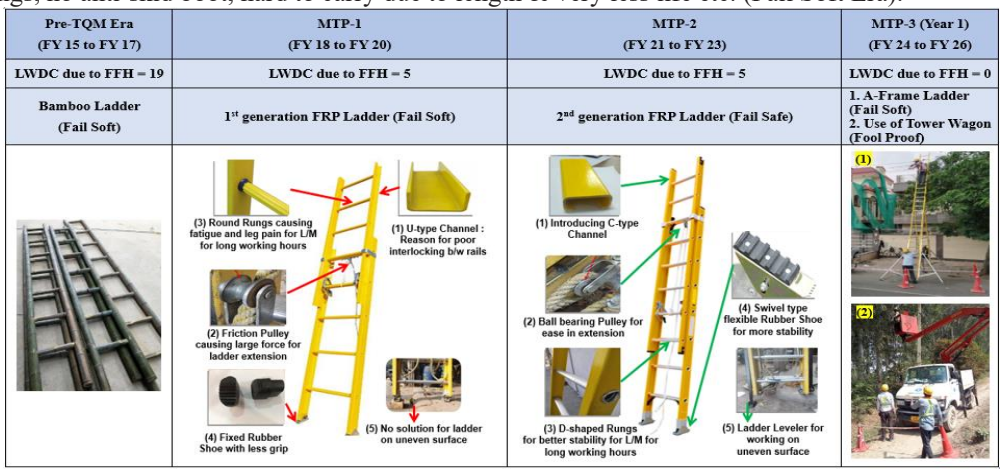


Figure 5.3: Improvements in Ladder from Pre-TQM to MTP-3

In MTP-1, FRP ladder was introduced but it also had some Flaws like – (1) Round rungs causing pain in legs during long working hours (2) Friction pulley causing high force in extending (3) Fixed rubber shoe having less ground grip (4) Poor interlocking due to U-channel & (5) Limitation on uneven surface (still in Fail Soft). In MTP-2, all these mentioned deficiencies were mitigated successfully, thus moving from Fail Soft to Fail Safe. **(Figure 5.3).** Due to all these improvements in ladder design Risk Priority Number (RPN) of the risk Fall from Ladder has reduced from 20 (Very High) to 9 (Medium).

5.1.5 Incident Reporting, Investigation & Learning

In Tata Power-DDL, we have a platform called Suraksha Portal for reporting occurrence of any Incident at site. All LWDC incidents are communicated with the team on roll & BA workforce through LQSC agenda. Based on the findings & recommendations of Incident Investigation Committee, the causes of the incidents are captured & accordingly, Corrective Actions (CA) are released through Sandesh from Safety. **Figure 5.4** explains the Incident investigation & learning process. All incident corrective actions are released through Sandesh from Safety & are also discussed with field teams through LQSC. Validation of corrective actions is ensured through site audits.

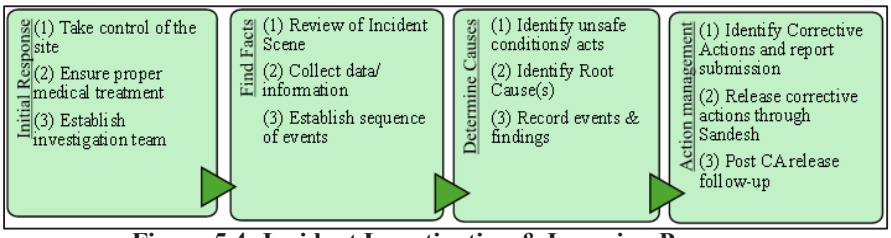


Figure 5.4: Incident Investigation & Learning Process

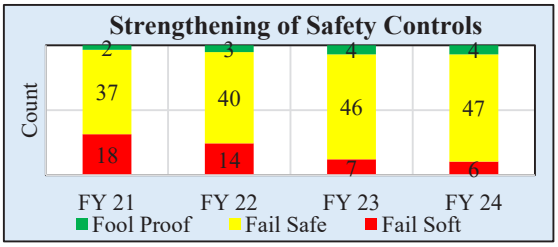


Figure 5.5: Strengthening of safety controls

All Corrective Actions (CAs) & learnings are spread through Sandesh (internal communication to all employees) as well as through discussion in LQSC. These CAs are deployed across the company & implementation is also ensured through Field Audits.

5.1.6 Overall Effects of TQM adoption

As advised by TQM Sensei, mitigation measures of identified Six Risks were monitored through Safety Triad starting from MTP-2. **Figure 5.5** shows Safety Triad trend over a period of 4 years (covering MTP-2 & 1st year of MTP-3) wherein the activities under "Fail Soft" have reduced & controls are strengthened.

5.2 Quality Assurance (QA)

5.2.1 Background

The QA system was primarily focusing upon quality of Infrastructure services such as network planning, designing, operations & maintenance, complaint handling, etc. Customer life cycle was not under its purview. With the initiation of the TQM adoption, development of an integrated QA System was initiated in the later period of MTP-1. Also, improvement projects were taken for deviating parameters of QA system.

5.2.2 QA Framework

In MTP-1, QA system structure didn't distinguish between the needs of different customer segments. As a result, high priority customers like Express & KCG were not getting differentiated services with respect to reliable & quality electricity supply as compared to other segments. Based on discussion with relevant stakeholders, segment-wise customer needs were collated as displayed in **Figure 5.6.**

Segments	24*7 Reliable Electricity Supply	Quality Electricity Supply	Faster new connection	Metering accuracy	Error free billing	Payment convenience	Lower Tariff	Quick resolution of Complaints	Smooth Disconnection
Express	◎	◎	◎	◎	◎	○	△	◎	◎
KCG	◎	◎	◎	◎	◎	○	△	◎	◎
HRB	◎	◎	◎	◎	◎	○	○	○	○
HCB	◎	○	◎	◎	◎	◎	◎	○	○
SCB	◎	△	○	○	△	○	◎	△	△
G&I	◎	◎	○	○	◎	◎	△	◎	△

Legend: ◎ - Very Important; ○ - Moderately important ; △ - Less important

Figure 5.6: Customer Voices & Needs

As per the advice of our Sensei, the QA System of Tata Power-DDL was designed with seven elements, viz., Q0 to Q6. This was developed based on the Train & Platform model wherein *'trains'* are represented by the needs of different customer segments during their lifecycle - 'Q0' & the *'platform'* is represented by the common infrastructure (Q1 to Q6) for providing services across all customer segments. The linkage between 'Q0' & 'Q1 to Q6' is shown using bridges representing their co-relation throughout the customer life cycle **(Figure 5.7)**

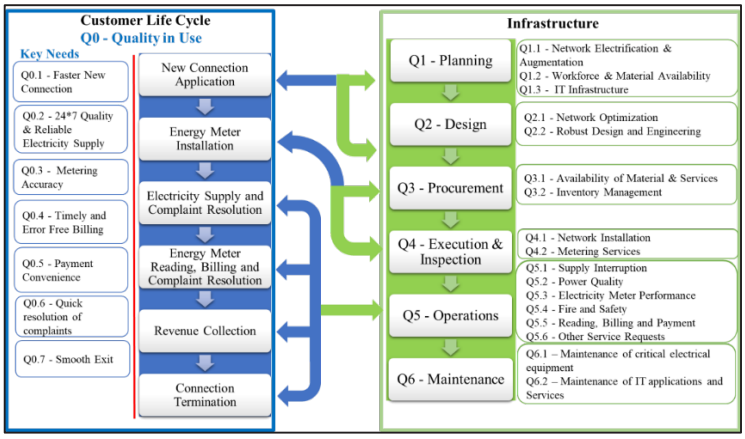


Figure 5.7: Quality Assurance System

5.2.3 Quality Assurance System Chart & Apex QA Review mechanism

A QA system chart has been prepared demonstrating linkages among different departments & functions. Apex Quality Cross Functional Committee chaired by CEO & Chief of Quality function, having representation of all functional Chiefs reviews the performance of QA System on monthly basis. At present, there are a total of 39 KPIs being monitored in QIS. Parameters of QA system which do not meet the targets are discussed & the improvement projects are taken by the respective owner group.

5.2.4 Effectiveness of QA System

There has been a continued focus to bring improvements through the implementation of cross functional QA System via monthly reviews of the deviating parameters. With the help of improvement projects undertaken against deviating parameters, the non-compliant ones have shown a decreasing trend (from 39% in Apr'21 to 16% in Feb' 24) over time, despite making the actionable window more stringent from 3 months to 2 months w.e.f. Aug'23, as visible in **Figure 5.8.**

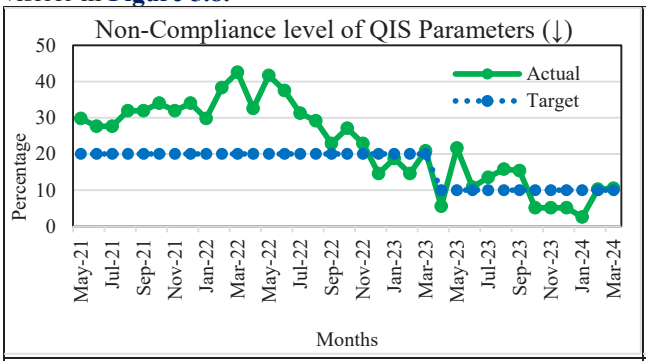


Figure 5.8: Non-Compliance level of QIS Parameters

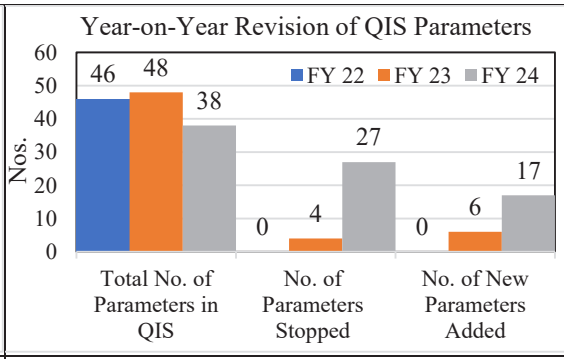


Figure 5.9: Revision of QIS parameters

The implementation of QA system has seen several iterations as several parameters which were continuously meeting the target were shifted to Daily Management & new parameters were added as per the Organisational requirements **(Figure 5.9).** These have been added to QA System chart over time.

5.2.5 Remaining Problems and Future plan

The QA system needs to be further strengthened for early detection of quality defects. The remaining problems & future plans are mentioned in **Table 5.1.**

Table 5.1: Remaining Problems & Future Plan		
S. No.	**Remaining Problems**	**Future Plan**
1	Further reduce the non-compliant parameters in 2 months block to Zero.	Strengthening the actions & review of deviating parameters. Initiation of vertical evaluation for strengthening the detection at early stage.
2	Delay in corrective action for the deviating parameters	Continue with monthly review of deviating parameters & associated QC projects at Apex level.

5.3 Segmented Employee Capability Building Framework

5.3.1 Background

Tata Power-DDL is committed for workforce development through diverse training programs. These programs are being managed by three departments - Learning & Development (L&D), Distribution Operations & Safety Excellence Centre (DOSEC) & Centre for Quality Excellence (CENQUEx). During the TQM diagnosis the feedback was received to improve the education system & building the mechanism for confirmation of its implementation status. Post TQM diagnosis, the team identified critical challenges & gaps in training processes & systems. This project aims to harmonize complete training processes of all three departments, fostering a cohesive, systematic approach & utilizing feedback loops to drive comprehensive skill development initiatives.
The initial challenges identified by the team are shown in **Figure 5.10.**

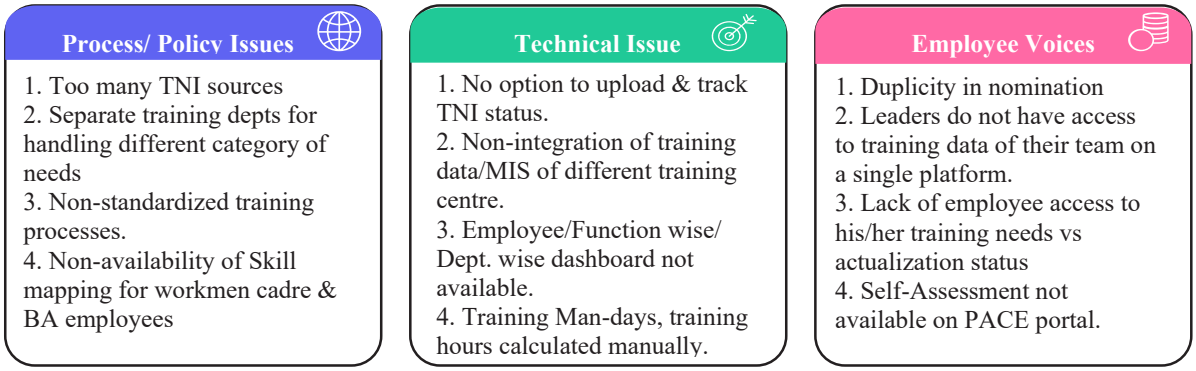


Figure 5.10: Current Challenges

5.3.2 Setting Up the Task

To adress the challeneges identified, the team worked towards development of a new framework as depicted in **Figure 5.11.**

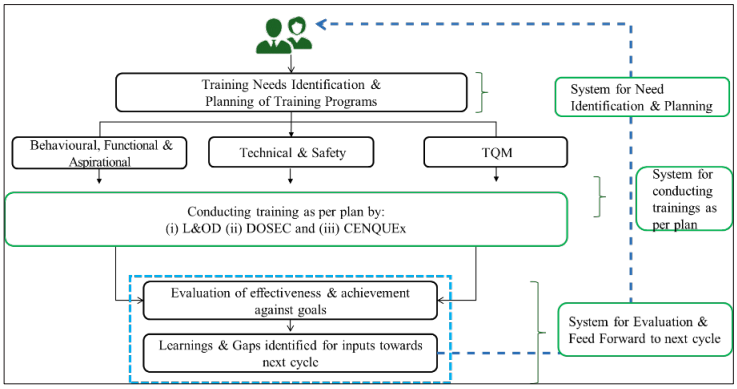


Figure 5.11: Proposed Training Framework

5.3.3 Exploring & Selection of Scenario

The best practices of other Deming award winning Organisations were studied, & the framework of M/s Komatsu was found to be the most suitable. The segmented approach followed for all employees' cadre was appreciable & accordingly, guidance was taken from the sensei, Dr. Kano, to develop a similar framework for Tata Power-DDL.

Referring to the training framework of M/s Komatsu, a similar system was created by categorizing employees into eight distinct employee segments based on their Organisational roles & each program was meticulously aligned with relevant training departments, ensuring clarity & accountability in Organisational capability development**.** This segmentation serves as the foundational element, facilitating precise customization of training programs as per employee segment specific needs. Thereafter, to deploy this system effectively, the team also worked towards developing an IT Application - Training Information Management System (TIMS) **(Exhibit 5.12)** with the following special features:

1) **Enhanced Learning Experience:** TIMS aims to offer a comprehensive, user-friendly platform, fostering a dynamic & engaging learning environment for employees.
2) **Tracking & Reporting:** Providing comprehensive dashboards empowers leaders to track team progress in training programs, ensuring real-time visibility for informed decision-making & enhanced accountability.

3) **Improved Coordination:** TIMS will streamline communication among the three departments, centralizing information for better coordination & a concerted effort toward Organisational capability development.
4) **Training Need Identification & Gap Analysis:** To harmoniize TNI & gap analysis further imorovements were done to the existing portal for TNI & Gap Analysis.

Further, it was observed that the competency assessment process for BA workforce was of subjective nature & the workforce was awarded competency band based on perception of the cross functional assessment team. To improve the overall assesment system for BA employees, it was decided to introduce a **Skill Matrix** based evaluation. was introduced **(Figure 5.14)**

5.3.4 Implementation Plan

Implementation plan for TIMS development has been depicted in **Table 5.2**

Table 5.2: Implementation Plan

S. No	Task	Responsibility	Target Date	Status
1	Revalidation of Functional Competency Framework	HoG TM	30-Apr-23	Done
2	Skill Matrix for Workmen cadre & Technical BA employees (Pilot Project for Moti Nagar district)	HoG DOSEC	31-Oct-23	Done
3	Overall TNCI Monthly Tracking through PPDI	HoD L&D, IT Team	31-Aug-23	Done
4	Revamp of training information Management System (TIMs)	HoD L&D, TQM CoE & IT	30-May-24	Phase 1 & 2 Done Phase 3 WIP
5	Analysis of PACE Competency Assessment	HoD L&D, TQM CoE	30-Sep-23	Done
6	Designing of Capability Building Process	HoD L&D, TQM CoE	15-Apr-24	WIP
7	Consolidation & upload of TNI on TIMs portal	HoD L&D	10-Oct-23	Done

5.3.5 Implement

Now a skill matrix framework **(Figure 5.13)** has been devised, where the BA workforce is assessed based on the specific skills pertaining to work environment & skill gaps are identified & accordingly trainings are imparted.

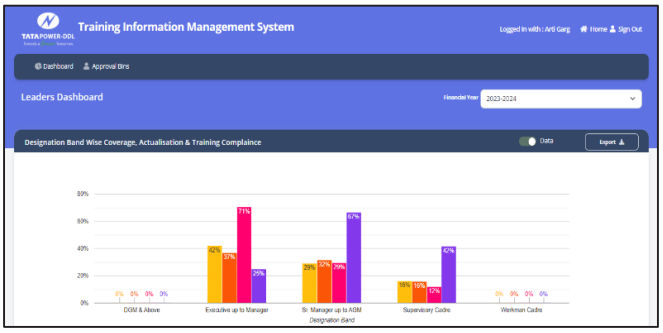


Figure 5.12: Snapshot of new TIMS Portal

Card Nos.	Skill / Names	Knowledge of Safety equipment and procedures	O & M of Distribution Transformers	O & M of Distribution Switch Gears
RN-129737	ASHISH KUMAR	✓	✓	✓
RN-129251	PARVEEN KUMAR	✓	X	✓
RN-129143	ROHIT	X	✓	✓

Figure 5.13: Skill Matrix for BA (Truncated)

5.3.6 Check

The skill development of on roll as well as BA employees was achieved as per the target.as depicted in **Figure 5.14.**

5.3.7 Standardize

The training process was revised & new TIMS platform has been scaled up for all trainings conducted by L&D, CENQUEX & DOSEC.

5.3.8 Conclusion

The base work of developing a segmented approach of all three training verticals has been completed successfully.

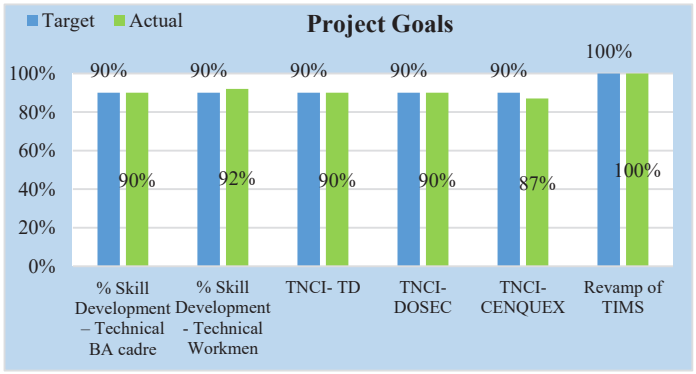


Figure 5.14: Project Goals

Moving forward, the actions for comprehensive tracking of competency & skill development of all employees including BA employees is to be ensured to gauge the actual effectiveness of the framework. The one- IT platform for all the trainings shall help immensely towards this cause.

6 OVERALL EFFECTS

6.1 Corporate Business Objectives (CBO) for MTP-1, 2 & 3

The overall effects of TQM adoption for key CBO & Challenging Strategies (CS) in MTP-1,2 & 3 are shown below.

6.1.1 CBO: Enhance Customer Satisfaction

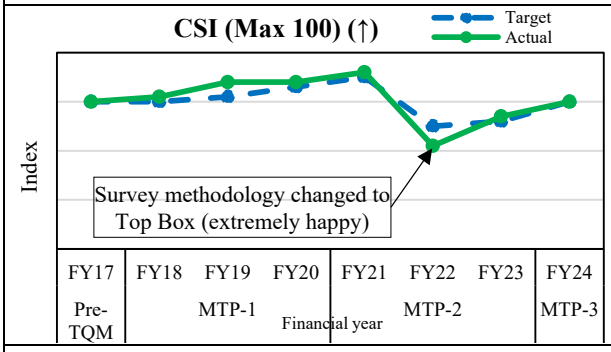


Figure 6.1: CSI has consistently been at high levels. Based on learnings from TQM approach, only Top box score in the survey was considered from FY22 onwards & improvements have been done thereafter.

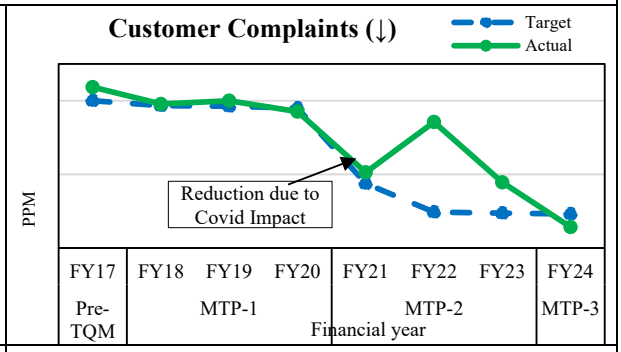


Figure 6.2: The complaints were almost same till FY 22, except in FY 21 where complaints reduced during COVID-19 pandemic. In FY23 & 24, there is a significant improvement by focused strategy on problematic areas.

6.1.2 CBO: Improve Reliability of Power Supply

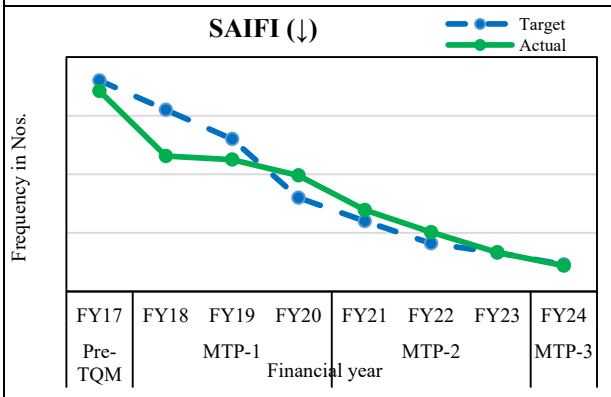


Figure 6.3: SAIFI has improved by 70% in the past 5 years by virtue of focused network improvement & maintenance efforts using TQM approach. The deviations are mainly due to delay in execution of projects during COVID-19 period & limited cash flow.

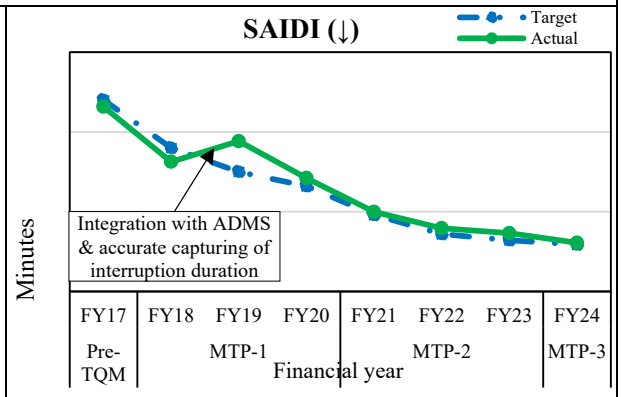


Figure 6.4: SAIDI is correlated with SAIFI & thus, improved by 70% in the past 5 years. Deviation in period FY19 was due to change in technology, resulting in a change in complaint capturing time. From FY19 onwards, favorable effects are observed

6.1.3 CBO: Reduce revenue loss

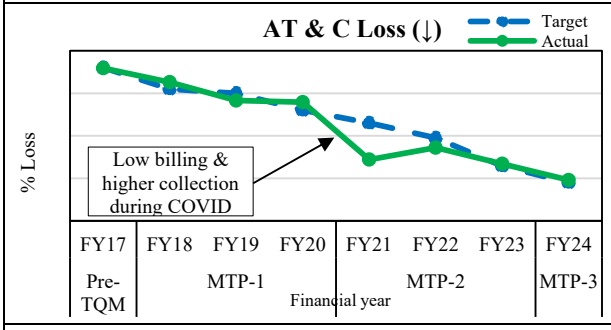


Figure 6.5: AT&C Loss has improved by 30% in the past 5 years with consistent over achievement of targets set by DERC. Use of advanced analytics & QC tools has helped in pinpointing theft cases leading to enhanced revenue & hence, affordable power for honest paying customers.

6.1.4 CBO: Strengthen Zero Harm culture

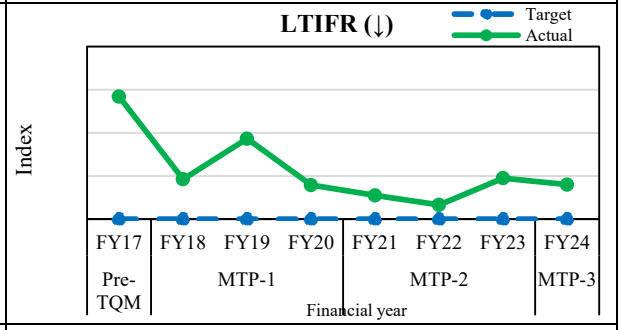


Figure 6.6: The approach has been changed from reactive to proactive & initiatives for mitigating high risk activities related to electrocution & fall from height have resulted in improved safety performance. However, there is still a lot to be done & the systems are being continuously improved with PDCA approach.

6.1.5. CBO: Enhance employee engagement & experience

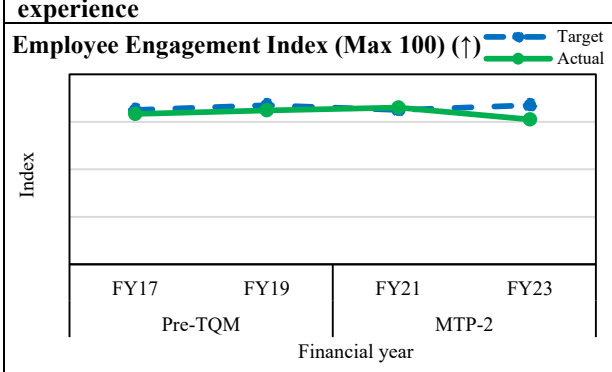


Figure 6.7: Employee Engagement survey is conducted through external agency once in 2 years. With Total Employee Involvement, the high levels were maintained even during COVID period. The drop in FY 23 is primarily due to the changing environment in the power sector post COVID. This is a remaining problem.

6.1.6. CBO: Empower beneficiaries in licensed area

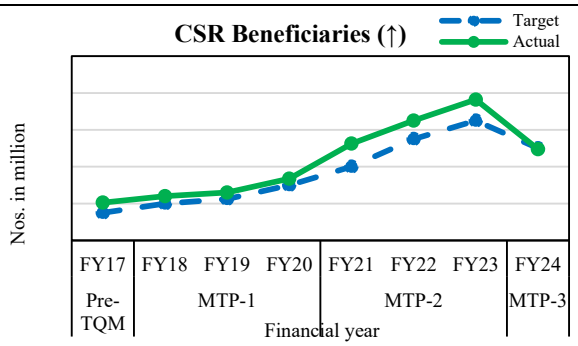


Figure 6.8: Programs under "SAATHI" framework have enabled consistent favorable trend in CSR beneficiaries. These are designed based on community needs & constantly improved. In MTP-3, post pandemic, the focus has been more on impact & effectiveness rather than count. Hence, there is a drop-in count in FY24.

6.1.7 CBO: Bring improvement through Business Excellence Initiatives

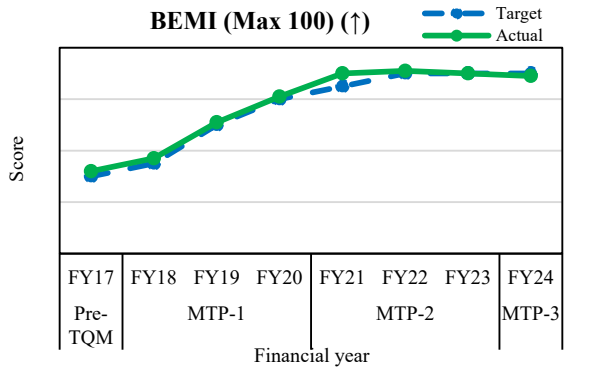


Figure 6.9: In FY20, the alignment of BEMI was done with TQM vehicles & since then, the guidelines are revised every year to make the framework stringent.

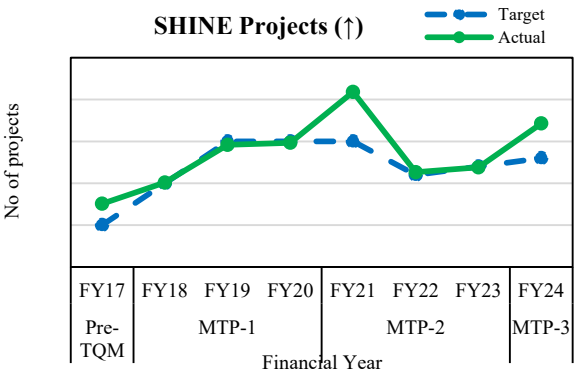


Figure 6.10: By virtue of structured training programs at CENQUEx, the SHINE Projects have significantly increased from FY 22 onwards.

6.1.8 CBO: Profit after Tax (PAT)

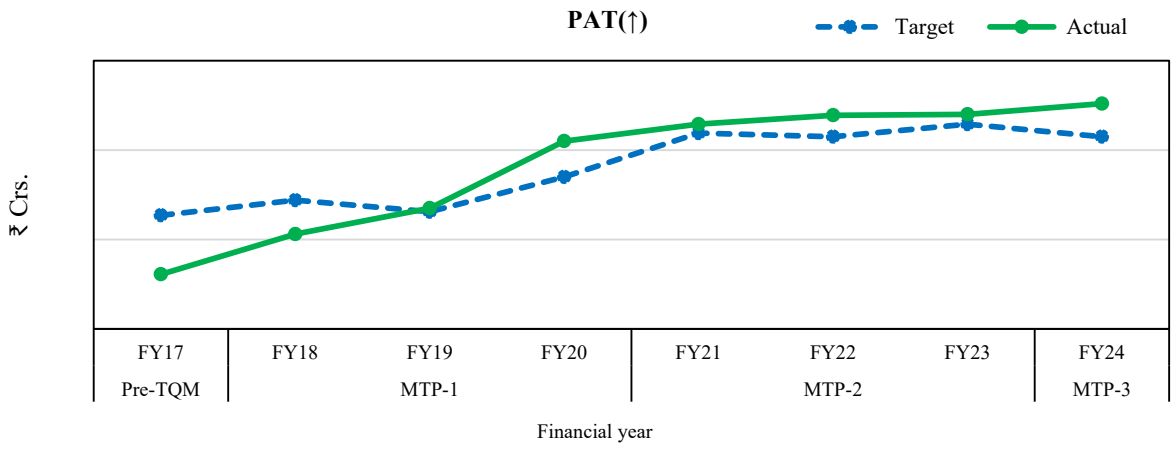


Figure 6.11: Improved PAT on account of higher AT&C incentives, high rebate income on power purchase, optimization of finance cost due to effective fund management.

6.1.9 CBO: Maintain profitability, attain cost reflective tariff, & ensure positive cash flow

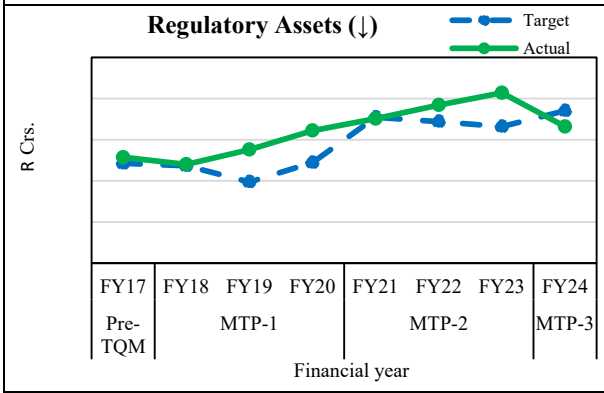


Exhibit 6.12: The high value of RA is still a remaining problem. However, with multiple policy advocacy initiatives with changes in strategy during MTP-2, a significant reduction has been achieved in FY24.

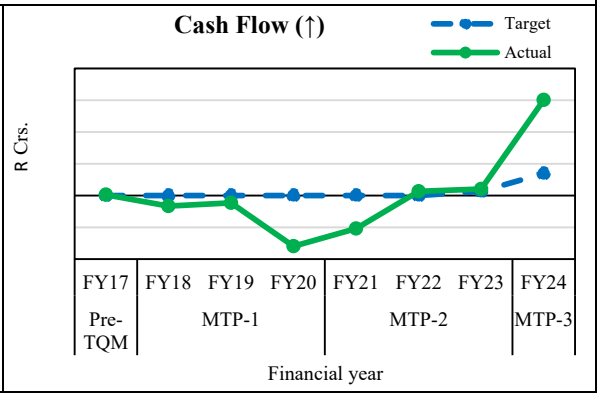


Exhibit 6.13: Cash Flow has increased significantly over the years. Identification of new initiatives through a structured approach for cost control has led to substantial gains in FY24.

6.2 Organisational Capabilities Developed

The TQM adoption journey has enabled the organisation to develop capabilities that have a longer-term return:

a. **Deeper understanding of segmented customer needs & expectations** is one of most important capabilities that has been developed at Tata Power-DDL which has helped in appreciating the concerns & working towards quality improvement. The customer centric culture has not only benefitted the external customers but brought about a change in department providing internal support services such as HR, D&IT & Finance. Further, the segmented approach of identifying specific needs has helped in improving processes & designing of segment specific services through technological interventions.

b. **Structured process of developing & achieving Business Objectives & Strategies with Policy Management Concepts for optimum utilisation of resources & doing more with less** is a capability built by virtue of our TQM adoption wherein an improvement in performance of almost 70% has been achieved despite a curtailed CAPEX. The PM approach has helped in correct identification of priority areas & development of means at each level.

c. **Inhouse Education & Training on TQM concepts** is a key capability developed by way of CENQUEx certification courses & development of in-house trainers. This has helped immensely in dissemination of knowledge & its application in business across all segments of employees – own as well as BA. It will facilitate further strengthening the TQM culture & building of new Organisational capabilities in future.

d. **Effective use to technology for meeting customer & business requirements** is a capability that has been instrumental in identifying the appropriate technology suitable for our customers' & business needs & reaping the maximum benefits from the process of Digital Transformation. The use of Business Analytics & Customer Experience platforms has led to new insights in customer behavior & thereafter, use of RPA, RvPE & other AI/ML solutions has enabled developing a competitive advantage over other companies in this sector.

e. **Structured Problem Solving using Statistical Methods:** is a major capability built by virtue of TQM Adoption and the employees' involvement in the process creates an accelerated growth journey. The continual improvement in objectives such as SAIFI, SAIDI, Complaints & AT&C over the period of 7 years has been possible only by virtue of this approach & changed the mindset of employees towards problem solving.

f. **Strengthening of Daily Management System** is the foundation for development of all other capabilities which has been instrumental in Tata Power-DDL maintaining its performance despite of almost 500 people moving out of the organisation during last 3 years. The standardization of 265 Processes & associated SOPs, training to all employees (including BA workforce) & DM monitoring through 800+ KPIs has helped in improving the employee capability in delivering quality services & reduced defects.

The above capabilities shall help Tata Power-DDL not only in achieving the long-term vision of becoming a benchmark company in Power Distribution, but also aid the parent company TPC in enhancing the business performance in other Distribution Companies in Odisha. The TQM journey has already been initiated in these organisations & the capabilities acquired at Tata Power-DDL shall be utilized effectively for creating another successful turnaround story.

7. REMAINING PROBLEMS & FUTURE PLAN

The remaining problems have been viewed from two perspectives – immediate ones from the perspective of the MTP-3 (upto FY26) & future plans from a longer-term perspective covering the next 3 MTPs (MTP-4, 5 & 6) which will span upto FY35. From the short-term perspective, the remaining problems that need focused effort are:

Table 7.1: REMAINING PROBLEMS & FUTURE PLAN

S. No.	Remaining Problems	Future Plan
1	Customer Complaints are still at high levels	• Use of structured problem solving for attacking problematic areas & strengthening of Daily Management for quality assurance. • Implementation of new technologies for eliminating manual errors
2	Further reduction in SAIFI/ SAIDI to reach benchmark levels	• Deployment of advanced technologies for enhancing operational efficiency such as Live line Maintenance, scaling up of Automation at 11 kV by Distribution Automation & 440 V by Low Voltage (LV) Automation.
3	Further reduction in AT&C loss to reach benchmark levels	• Targeting for Billing Efficiency of 95% through a Cross functional team approach & deeper use of analytics for theft detection
4	Inherent business & site risks related to Safety	• Focus on Safety Performance through lead parameters. • Action planning and mitigation of Risks for Electrocution, Flash Injury, Fall from Height, Road Accident, Fire incidents, PPE Compliance through technological solutions
5	Employee engagement levels as per external survey are below expectations	• Strengthening of Capability Development Framework & providing avenues to employees for acquiring new skills & competencies
6	Sustenance of positive Cash Flow	• Initiatives to reduce ACoS - Opex cost optimization. • Policy advocacy with regulator for Tariff release, PPAC eligibility • Power Purchase cost optimisation.
7	Scaleup of successfully implemented Digital Transformation projects	• Identification of potential projects for scale-up as per customer & business needs such as Smart Metering, LV Automation, New Robotic Process Automation (RPA) Projects
8	Limited involvement of BA employees in improvement projects	• Enhancing coverage of BA employees through CENQUEx certification courses at Genba

From a longer-term perspective (next 8-10 year view) with the next three MTPs, the intent is to work towards achieving the vision of becoming a benchmark power utility providing sustainable, affordable & innovative solutions. With this in mind, the long-term goals have been developed as mentioned in **Figure 7.1**. For achieving these, it is intended to apply TQM tools & techniques with greater rigour based on the learnings during the journey & accelerate the growth rate with greater employee involvement & capability development. This will need more investment in Education & Training as advanced tools & methods would be needed. Further, we would continue to do PDCAs in the PM, DM & IM processes to fine tune these for effective deployment.

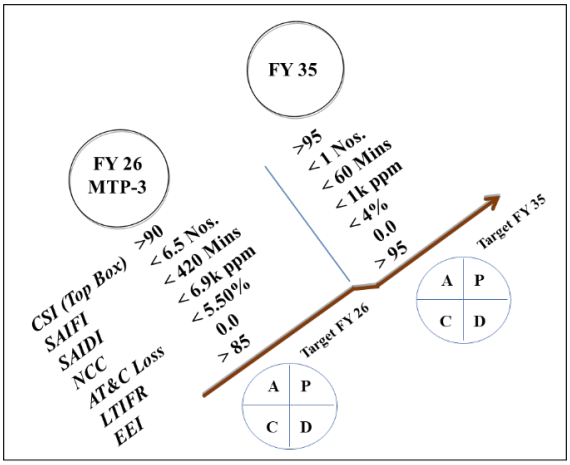


Figure 7.1: Aspirations for FY35 to become a benchmark power utility

In addition, since Tata Power-DDL is a part of the Tata Power group, which is operating 6 other Distribution Companies across India, the successful & effective application of TQM for business improvement in Tata Power-DDL would be followed by its full-scale rollout in other Distribution Companies. An effort on this has already started in 4 Discoms with 5-S awareness & implementation being initiated. In FY 25, the plan is to initiate Education & Training on TQM & its vehicles through same approach as CENQUEx certification courses for Senior & Middle Management for developing their understanding on the concepts & thereafter, develop the Customer Driven Objectives & long-term roadmaps for achieving them is a structured manner using the TQM approach.

8. TERMINOLOGY GLOSSARY & ABBREVIATIONS

Abbreviation	Description
ADMS	**Advanced Distribution Management System** is the software platform for DISCOMs. It helps in locating fault, isolation and restoration, volt/volt-ampere reactive optimization, conservation through voltage reduction & peak demand management.
AIC	**Accident Investigation Committee**, a TATA Power DDL committee that provides information and evidence of hazards and deficiencies in the company.
AMC	**Annual Maintenance Contract** is an agreement between TATA Power DDL and BA for the ongoing maintenance activities.
AMR	**Automatic Meter Reading** is the technology of remotely collecting electronic Meter Reading data & diagnostic from energy metering devices and transferring that data to a central database for billing, troubleshooting, and meter data analysis.
ARR	**Aggregate Revenue Return** means the revenue required to meet the costs pertaining to the Distribution Business, for the control period, which would be permitted to be recovered through tariffs and charges by the DERC.
AT & C Loss	**Aggregate Technical & Commercial Loss** AT&C Loss = 1- (Billing Efficiency x Collection Efficiency) This is the ratio of electricity units for DISCOM paid by all customers divided by the number of electricity units purchased by DISCOM.
BBS-SOC	**Behavior Based Safety - Safety Observation and Conversation**, BBS is a process that informs management and employees about the overall safety of the workplace through safety observations
BE	**Billing Efficiency** is an indicator of proportion of energy that has been billed (includes both metered and unmetered sales) to consumers with respect to energy supplied to an area. Billing Efficiency (η_{Bill}) = Billed Energy/ Input Energy) This is one of the components of AT&C which is explained above
BEE	**Bureau of Energy Efficiency** is an agency of the Government of India, under the Ministry of Power to develop programs which will increase the conservation and efficient use of energy in India.
BEMI	**Business Excellence Maturity Index** is a framework to capture employee engagement through continual improvement, exchange of tacit and explicit knowledge, adoption of ISO standards, 5S etc. at holistic level to imbibe a process driven quality culture in the organization.
BESS	**Battery Energy Storage System** are devices that enable energy from renewables like solar and wind, to be stored and then released when customers need power most. For this purpose, TATA Power-DDL has installed 10 MW battery as initial project.
BIS	Bureau of Indian Standards: Governing Body for National Standards in India.
BPR	**Business Process Re-engineering**: The analysis and redesign of workflows within and between enterprises in order to optimize end-to-end processes and automate non-value-added tasks.
C&I	**Commercial & Industrial Customers** means any person, legal entity or business organization classified as a customer using the Services for or in connection with the exercise of a commercial or industrial activity of any sort
CE	**Collection Efficiency** ($\eta_{Collection}$) = **Amount** Collected / Amount Billed). This is another component of AT&C.
CEIIC	**Clean Energy International Incubation Center is a** joint initiative of Tata Trust and Government of India for promoting innovations in the energy sector
CENQUEx	Centre for Quality Excellence: This is a dedicated learning & education academy for TATA Power-DDL employees & BA's, to train the workforce on TQM concepts
COS	**Corporate Operations Services:** This group is responsible for providing operational support to Zonal Teams through Innovative Solutions and Standardization.
CSL	**Corporate Street Light:** This department is responsible for repair & maintenance of Street Lights in Tata Power-DDL areas of operation.
CSM	**Contractor Safety Management:** A guidelines for safety of BA workforce.

Abbreviation	Description
CWIP	**Capital Work in Progress**: It is a cost incurred to date on a fixed asset, which is still under construction on the balance sheet date.
DI	**Digitisation Index:** An index to measure the level of digitization, mainly Automation, Digitisation, Automated Input, Process Integration & Exchange Information and Output.
DOSEC	**Distribution Operations & Safety Excellence Centre:** It is a department in Tata Power-DDL which is responsible for in-house technical training for both on-roll & BA employees, primarily on safety and quality aspects of various jobs.
DT/ DTs	**Distribution Transformer-** A transformer that provides the final voltage transformation in the electric power distribution system
DTMS	**DOSEC Training Management System:** A software for online management of DOSEC (Distribution Operations & Safety Excellence Centre) training programs.
DTx	**Digital Transformation:** Journey to modernize IT & OT infrastructure for driving the business objectives of Operational Excellence & Customer Value Creation
EaaS	**Energy as a Service**: A Sub-department / Group (sub-department) in TATA Power-DDL to implement business model whereby customers pay for an energy service without having to make any upfront capital investment.
FRP	Fibre Reinforced Polymer
SAIDI	**System Average Interruption Duration Index:** A system index of average duration of interruption in the power supply indicated in minutes per customer
SAIFI	**System Average Interruption Frequency Index:** A system of average frequency of interruptions in power supply per customer. Its UoM is Numbers
SHINE	Systematic and Holistic Improvement Initiatives at Tata Power-DDL through Employee's Engagement. This is the platform which encourages Employees to undertake Improvement and Innovation projects at Tata Power-DDL
SLT	**Senior Leadership Team:** It is a set group of senior leaders who meet to strategize and advise.
TBEM	**Tata Business Excellence Model:** The main objective is to enhance value for all stakeholders and contribute to marketplace success, maximize enterprise-wide effectiveness and capabilities, and deliver organizational and personal learning.