2026　デミング賞

選考理由書　受賞報告講演要旨　デミング賞委員会事務報告

2026 年 11 月

デ　ミ　ン　グ　賞　委　員　会
一般財団法人 日本科学技術連盟

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デミング賞　選考理由書

2026 年度
デミング賞 選考理由書

2026 年度のデミング賞各賞ならびに日経品質管理文献賞の受賞者は 10 月 6 日開催の第 2 回デミング賞委員会において，下記のとおり決定いたしました．

1．デミング賞本賞

山田　　秀 氏
慶應義塾大学　理工学部　管理工学科　教授

2．デミング賞特別功労・実践賞

宮本　眞志 氏
トヨタ自動車株式会社　カスタマーファースト推進本部　本部長，Chief Quality Officer

3．デミング賞

PT. Cataler Indonesia

独立行政法人国立病院機構 仙台医療センター

SONA BLW Precision Forgings Limited, Driveline Division

Tata Toyo Radiator Limited

4．日経品質管理文献賞

「測定の不確かさとその周辺
不確かさの表現のガイド（GUM）をめぐる 16 のおはなし」
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「JSQC 選書 40
病院だから TQM　デミング賞を通して見えたもの」
著　者：福村　文雄 氏，立石　奈々 氏

「品質経営改革
自工程完結を良いモノ造りのプロセス整備から企業価値向上経営手法へ」
著　者：佐々木　眞一 氏

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デミング賞本賞

山田　秀 氏

慶應義塾大学　理工学部　管理工学科　教授



［選考理由］

山田秀氏は，1993 年東京理科大学大学院工学研究科博士課程修了（博士（工学））後，東京理科大学工学部助教授，筑波大学大学院ビジネス科学研究科教授を経て，2016 年慶應義塾大学理工学部教授となり，現在に至っている．

山田氏の主要な功績は，次の 3 つにまとめられる．

第一に，国内外の学協会活動を通じて TQM の発展に貢献してきたことである．日本品質管理学会では会長をはじめ多くの要職を務め，英文論文誌『Total Quality Science』の創刊で中心的役割を果たした．Asian Network for Quality の議長としてアジアにおける TQM の発展に貢献した．ISO/TC 176，IEC/TC 111，ISO/TC 69 /SC 4 の国内委員会委員長を歴任し，品質マネジメントや統計的方法に関する国際標準化を推進した．これらの功績により工業標準化事業表彰経済産業大臣表彰や IEC 1906 賞を受賞した．

第二に，教育・啓発活動を通じて TQM の発展に貢献してきたことである．デミング賞審査委員会副委員長，日経品質管理文献賞委員長，QC サークル関東支部世話人として品質管理の発展に尽力した．実験計画法セミナー運営委員会委員長を 20 年以上務め，産業界における統計的方法の教育・普及に大きく貢献した．

第三に，統計的品質管理に関する研究を通じて TQM の学術的発展に貢献してきたことである．科学的な品質経営において必要となる，データ解析とその応用，実験計画法を中心として幅広い研究を行ってきた．特に，過飽和実験計画について継続的に研究し，この分野の発展に貢献した．これらの成果は著書 25 冊と査読付き論文 55 編として公表され，6 回の日経品質管理文献賞を受賞した，

このように，山田氏は学界や産業界にわたり TQM の普及・発展に顕著な貢献をした．

〔主要著書ならびに論文〕

著書　［1］山田秀：『実験計画法－過飽和計画の構成とデータ解析－』，共立出版，2023.
［2］山田秀：『実験計画法の基本－統計的取扱いと原理－』，サイエンス社，2025.
以上を含め著書計 25 冊.

論文　［1］Yamada, S. (2000), The requirements on statistical techniques in QS-9000, *Asian Journal on Quality*, Vol. 1, No. 1, pp. 24-31.
［2］Yamada, S., Matsui, M., Matsui, T., Lin, D. K. J. and Takahashi, T. (2006), A general construction method for mixed-level supersaturated design, *Computational Statistics & Data Analysis*, Vol. 50, pp. 254-265.
以上を含め論文計 55 編.

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デミング賞特別功労・実践賞



宮本　眞志 氏

トヨタ自動車株式会社

カスタマーファースト推進本部　本部長，Chief Quality Officer

［選考理由］

宮本 眞志氏は，現在，トヨタ自動車株式会社カスタマーファースト推進本部 Chief Quality Officer を務めている．1983 年に豊橋技術科学大学大学院エネルギー工学修士課程を修了後，トヨタ自動車株式会社に入社し，品質保証部企画統括室長，お客様品質部長，品質保証部長，常務理事，パワートレーンカンパニー Executive Vice President，常務役員などを歴任した後，2020 年より Global Chief Quality Officer として全世界の品質活動を統括している．

同氏の功績の第一は，トヨタ自動車における品質経営の実践である．Chief Quality Officer としてグローバル品質会議を主導し，品質方針の展開，重要品質課題への対応，再発防止活動および将来の品質戦略策定を推進してきた．とりわけ 2010 年のリコール問題を教訓として，グローバル品質ガバナンスの再構築と品質マネジメントシステムの強化に取り組み，お客様の安全・安心を最優先とする品質経営を実践してきた．また，「トヨタ再出発の日」や「品質学習館」を核とした活動を通じ，品質最優先の企業文化を継承し，品質を自分事として捉える風土づくりを推進している．さらに，お客様月間や品質月間の活動を通じて顧客の声を起点とする改善活動を展開するとともに，ISO9001 と融合した新たな品質マネジメントシステム構築や社内監査員育成にも尽力し，全社的な品質保証基盤の強化を実現した．

第二は，トヨタグループにおける TQM 活動の発展への貢献である．2013 年からトヨタグループ TQM 連絡会の幹事・委員長として活動し，SQC 活用推進や QC サークル活動の活性化を主導した．特にオールトヨタ TQM 大会をグループ全体に発展させ，協豊会，栄豊会，販売店協会を含む日本最大級の TQM 推進活動へと成長させた功績は大きい．

第三は，日本の品質経営および TQM 活動の発展への貢献である．同氏は日本科学技術連盟　品質管理シンポジウム（QCS）組織委員として，新たな顧客価値創造と社会課題解決を両立する品質経営の方向性を提唱し，「令和大磯宣言 2023」の発出にも大きく寄与した．また，企業価値向上経営懇話会運営委員として品質経営の普及に取り組み，デミング賞委員として賞の発展にも貢献している．さらに QC サークル東海支部副支部長，顧問として支部運営や新たな活動の提言を行い，QC サークル活動の活性化と発展を支援している．

以上のように，宮本氏はトヨタ自動車およびトヨタグループにおける品質経営と TQM の実践を通じて顧客価値創造と組織能力向上を実現するとともに，日科技連，デミング賞，QC サークル活動等を通じて我が国の品質経営の発展に顕著な功績を挙げてきた．その業績は，まさにデミング賞特別功労・実践賞にふさわしいものである．

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デ ミ ン グ 賞

PT. Cataler Indonesia

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事業内容：自動車・二輪車用触媒の製造
売 上 高：7,800 万 US ドル（約 122 億円 /2024 年 4 月 -2025 年 3 月）
従業員数：121 名




［選考理由］

同社は，インドネシアにおいて自動車・二輪車用触媒の製造・販売を行う Cataler Group の海外拠点である．従業員約 120 名という小規模な組織でありながら，顧客要求への対応，安定した品質・生産の確保，人材育成等に取り組み，同 Group の事業を支える生産拠点として発展してきた．

同社は，目指すべき姿を明確化するべく，CIC VISION 2045 および CIC 中長期経営計画を策定した．日本の「Sanpo Yoshi」とインドネシアの相互扶助の精神である「Gotong Royong」を結び付け，自社の文化・組織特性に適した経営を目指し，FY2028 の経営目標の実現に向けて全員参加で TQM を推進している．

同社の TQM における第一の特徴は，Gotong Royong の精神を活かした全社的な多能工化と相互補完型人材育成である．C-HAM（Cataler Human Asset Management）を基本に，職務記述書から業務リストと必要能力を明確にし，多能工化を全社的に推進している．OJT，各種訓練，内部トレーナーの育成等を組み合わせ，限られた人員でも相互に業務を補完できる組織づくりを進めている．

第二の特徴は，QC サークル Framework（進め方ガイド）を活用した問題解決人材の計画的育成である．QC サークルを自ら問題を発見・解決できる人材を育成する実践の場と位置付け，Key Person を定めて活動途中にレビューとフィードバックを行っている．また，問題解決スキル，コミュニケーション，チームワーク等を評価し，その結果を教育やサークル支援へ反映する人材育成の PDCA を実践している．

第三の特徴は，部門横断的な知識の活用による小規模組織の経営能力向上である．各部門の専門知識や経験を他部門の業務改善や人材育成へ活用しており，経理部門の分析を関連部門の在庫管理改善へ展開している．また，保全部門や品質部門では，過去のトラブルとその原因・対策を Kakotora（過去トラ）等として蓄積し，問題解決や類似問題の未然防止，人材育成へ活用している．

以上の活動により，顧客クレームや大型スクラップの抑制，設備故障率・MTTR の改善，業務効率化，低い離職率の維持，顧客満足度の向上などの成果を上げている．さらに，従業員が自ら問題を発見・解決し，部門を越えて協力して改善する力が向上するなど，人・組織能力の面でも成果を上げている．

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PT. Cataler Indonesia

Representative : Mr. Katsunori Murabayashi, President Director
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Cikarang Pusat, Bekasi – Jawa Barat 17530, Indonesia
TEL : +62-21-5055-5601
Business : Manufacture of catalysts for automobiles and motorcycles
Sales : USD 78 million (approximately JPY 12.2 billion / April 2024–March 2025)
Employees : 121






[Reason for selection]

The organization is an overseas production base of the Cataler Group, engaged in the manufacture and sale of catalysts for automobiles and motorcycles in Indonesia. Despite being a relatively small organization with approximately 120 employees, it has developed as an important production base supporting the Group's business through its efforts to meet customer requirements, ensure stable quality and production, and develop human resources.

To clarify the future direction of the organization, CIC has established CIC VISION 2045 and the CIC Medium- and Long-Term Business Plan. By integrating the Japanese concept of Sanpo Yoshi with the Indonesian spirit of mutual cooperation, Gotong Royong, the organization aims to develop a management approach suited to its own culture and organizational characteristics. Based on this philosophy, all employees are participating in TQM activities aimed at achieving the business objectives for FY2028.

The first distinctive feature of its TQM is the organization-wide development of multi-skilled employees and a mutually supportive human-resource development system based on the spirit of Gotong Royong. Using C-HAM (Cataler Human Asset Management) as its foundation, the organization clarifies the required tasks and competencies based on job descriptions and promotes multi-skilling throughout the company. By combining OJT, various training programs, and the development of internal trainers, it is building an organization in which employees can mutually support and complement one another even with limited manpower.

The second distinctive feature is the systematic development of problem-solving personnel through the QC Circle Framework, a practical guide for conducting QC Circle activities. QC Circles are positioned as a practical forum for developing employees who can independently identify and solve problems. Key Persons are designated to provide reviews and feedback during activities. The organization also evaluates problem-solving skills, communication, teamwork, and other competencies, and reflects the results in training and QC Circle support, thereby implementing a PDCA cycle for human-resource development.

The third distinctive feature is the enhancement of management capability in a small organization through the cross-functional utilization of knowledge. Specialized knowledge and experience accumulated in each department are actively applied to improvement activities and human-resource development in other departments. For example, analysis conducted by the Finance Department is utilized to improve inventory management in related functions. In addition, the Maintenance and Quality Departments systematically accumulate past troubles, their causes, and countermeasures as Kakotora (Past Troubles) and other knowledge, which is then utilized for problem solving, prevention of similar problems, and human-resource development.

As a result of these activities, the organization has achieved improvements in customer complaints, major scrap, equipment failure rates, MTTR, operational efficiency, and customer satisfaction, while maintaining a low employee turnover rate. Furthermore, significant progress has been made in terms of human and organizational capability: employees have become increasingly capable of identifying and solving problems independently and collaborating across departmental boundaries to drive continuous improvement.

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デ ミ ン グ 賞

独立行政法人　国立病院機構　仙台医療センター

代表者名：院長　江面　正幸
所 在 地：宮城県仙台市宮城野区宮城野二丁目 11 番 12 号
Ｔ Ｅ Ｌ：022-293-1111
事業内容：医業
売 上 高：約 269 億 7000 万円（2025 年 3 月期）
従業員数：非公開






［選考理由］

同組織は，宮城県仙台市に位置し，656 床，34 診療科を備え，地域住民に主として急性期医療を提供する高度急性期病院であり，売上高は 269 億 7000 万円（2025 年 3 月期）である．1937 年に創設され，2004 年より独立行政法人国立病院機構の一員として，北海道東北グループに属している．

同組織は，独立行政法人化以降，職員の異動が多い組織環境の中でも，ISO 9001 を基盤とした日常管理を中心に TQM を推進してきた．さらに，医療の高度化・複雑化などの環境変化に対応するため，2023 年に「ビジョン 2028」を策定し，地域に選ばれる高度急性期病院となること，および職員が誇りを持って働ける組織を実現することに向け，TQM を経営の中核に据えた取り組みを展開している．

同組織の TQM の第一の特徴は，登録医からのニーズを把握した上で構築された紹介・逆紹介の仕組みである．2023 年度から医療連携委託業者の専従職員を配置し，登録医を直接訪問することにより，従来の医師による訪問では把握しにくかった率直な意見や要望を収集している．こうした活動により，月平均紹介患者数は着実に増加しており，地域に必要とされる病院のあり方を顧客の声から明確にし，改善と成果につなげる優れた取り組みとなっている．

第二の特徴は，内部監査の仕組みを活用した継続的改善である．2008 年の ISO 9001 認証取得以降，ルールへの適合状況の確認に加え，日常業務に潜在する問題を発見し，医療の質向上につなげる内部監査を継続している．特に診療記録の監査は，日常の医療の質を維持・向上する重要な仕組みとなっている．また，監査員を計画的に育成し，改善力の向上と人材育成を図っている．これらを定着させ，組織の問題解決能力の向上に結び付けている．

第三の特徴は，強固な TQM 推進組織である．TQM 推進室は，ビジョン，基本方針，重点課題の体系化から，方針管理の仕組みの整備と運営，内部監査や文書管理を含む日常管理，人材育成，継続的質改善活動までを一体的に担い，各活動を強力に牽引している．複数部門が分担する機能を TQM 推進室に集約し，経営課題と改善活動を直接結び付けている．

これらの活動の結果，地域医療機関との関係が強化され，紹介患者数は着実に増加するとともに，経営状況も改善している．また，内部監査を通じた業務の標準化と継続的改善が進み，職員の改善力も向上している．さらに，強固な TQM 推進組織のもと，ロボット手術をはじめとする高度専門医療についても，設備投資，患者確保，技術の高度化，安全な運用と質保証を一体として進め，対象診療科や手術件数を拡大している．このように，顧客の声を起点とした地域連携，内部監査を活用した継続的改善，それらを支える強固な TQM 推進組織によって，経営の安定化と医療の質向上を両立させている点は高く評価できる．

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デ ミ ン グ 賞

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事業内容：自動車部品製造販売
売 上 高：211 億 1,800 万ルピー
（約 380 億円／ 2024 年 4 月 -2025 年 3 月）
従業員数：3,288 名





［選考理由］

同組織はインドに拠点を置く自動車部品メーカーである． Driveline Division は，インド国内外の車両メーカーおよび Tier1 に対し，デフ用精密鍛造ギア（世界市場のシェア 8.7%），デフ Assembly などの製品を開発･製造･販売している．事業売上高は INR 21,118 million（USD 232 million）で，インド国内に 6 工場，メキシコに 1 工場の生産拠点があり，2026 年 6 月 30 日時点の従業員数は 3,288 人である．

同組織は，急速な事業拡大，事業の複雑化，顧客要求の厳格化に対応するとともに，ベベルギヤ，デフ Assembly，ギア減速機，遊星ギア，さらに将来的には eVTOL や Robot 向け製品へと事業領域を拡大するため，2017 年に TQM を導入し取り組んできた．2024 年に TQM 診断を受審し，診断時の意見書を参考に改善を進めることで，TQM の強化と浸透を図ってきた．2025 年にはビジョン，長期目標および戦略を見直し，必要な活動に重点的に取り組んでいる．

同組織の第一の特徴は，ビジョン - 中長期経営目標 - 年度計画に展開する一連のプロセスを構築している点である．首脳部がリーダーシップを発揮し，年次会議を通じて将来の市場や製品について継続的に検討し，毎年開発する製品を選定・投入している．トップが出席する 5 か年戦略計画のレビューの中で，市場や顧客の変化を踏まえながら将来の製品構成を検討し，その意思決定によって高い成長を支えている．ビジョンの実現に向け，中長期経営目標と戦略を設定したうえで年度計画を策定し，さらに各部門の Managing Point と Checking Point へ展開して実行・レビューする仕組みが明確にされている．この仕組みを，3 年ごとの中長期経営目標の設定と年度計画への展開という形で繰り返し運用している．

第二の特徴は，将来の事業拡大を見据え，必要な人材を明確にして計画的に育成・活用している点である．将来の事業や製品ロードマップを踏まえて必要となる Business Core Competencies と Skill Sets を明確にし，製品・技術ごとに必要なスキルとの対応関係を整理している．さらに, 対象者を選定してスキルギャップを把握したうえで育成計画を策定し，新製品・新技術の開発に必要な人材を事前に育成する仕組みを構築している．

第三の特徴は，良品を安定的に供給するための日常管理の徹底である．Shop ごとに変化点を 4M Change Management Matrix で定義し，その状況を 4M Change Display Sheet により現場の日常管理板に掲示するとともに，Procedure for Change Management に従って，トップ報告，マネージャー報告と層別して変化点管理の徹底を図っている．また，異常処置ミスによる不適合品流出を防ぐため，Red Rabbit Training と呼ばれる独自の異常処置訓練を実施している．

以上の活動の結果，事業売上高は TQM 導入前 FY18 の INR 6,089 million から FY25 には INR 21,118 million へと 3.5 倍に増加し，顧客数は 30 社から 64 社，納入拠点数も 40 拠点から 148 拠点へと増加するなど，経営目標の各指標は着実に向上している．また，急速な事業成長の中で，開発リードタイムも平均 217 日から 84 日へと短縮し，顧客苦情も 77％低減している．これらはいずれも優れた成果であり，TQM を活用した効果がでている．

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SONA BLW Precision Forgings Limited, Driveline Division

Representative : Mr. Vikram Verma Vadapalli, Director and Chief Executive Officer
Address : Sona Enclave, Village Begumpur Khatola, Sector 35,
Post Box No. 90, Gurugram – 122004, Haryana, India
TEL : +91-98-1889-8350
Business : Manufacture and sale of automotive components
Sales : INR 21.118 billion (approximately JPY 38 billion /
April 2024–March 2025)
Employees : 3,288





[Reason for selection]

The organization is an automotive component manufacturer based in India. Its Driveline Division develops, manufactures, and sells precision-forged differential gears, which account for an 8.7% share of the global market, differential assembly, and other products for vehicle manufacturers and Tier 1 suppliers in India and overseas. The Division has sales of INR 21.118 billion (USD 232 million), with six manufacturing plants in India and one in Mexico, and has 3,288 employees as of June 30, 2026.

In response to rapid business expansion, increasing business complexity, and increasingly stringent customer requirements, the organization introduced TQM in 2017. It has since expanded its business domain from bevel gears and differential assembly to reducer gears and planetary gears, with plans to enter future markets such as eVTOL and robotics. In 2024, the organization underwent a TQM Diagnosis and has continued to strengthen and embed TQM by using the observations and recommendations provided during the diagnosis. In 2025, it also reviewed and revised its Vision, Long Term Goals, Strategies and has focused its efforts on activities essential for achieving them.

The first distinctive feature is the establishment of an integrated process for deploying the Vision into medium- and long-term business objectives and annual plans. Top management demonstrates strong leadership by continuously discussing future markets and products through the annual strategic meeting and selecting products for development and launch each year. During reviews of the five-year strategic plan attended by top management, the organization examines future product portfolios in light of changes in markets and customers. These decisions have supported its high rate of growth. Based on its Vision, medium- and long-term business objectives and strategies are established, followed by annual plans. These plans are then deployed to each department through clearly defined Managing Points and Checking Points, which are used for execution and review. This process is repeatedly operated through the establishment of medium- and long-term business objectives every three years and their deployment into annual plans.

The second distinctive feature is the systematic development and utilization of human resources in anticipation of future business expansion. Based on future business and product roadmaps, the organization identifies the required Core Competencies and Skill Sets and clarifies the relationship between these competencies and the skills required for each product and technology. It then identifies target employees, assesses skill gaps, and develops training plans, thereby establishing a system for proactively developing the human resources required for new product and technology development.

The third distinctive feature is the thorough implementation of daily management to ensure the stable supply of quality products. Changes at each shop are defined using a 4M Change Management Matrix, and their status is displayed on daily management boards through 4M Change Display Sheets. In accordance with the Procedure for Change Management, changes are also reported at different levels, including to top management and managers, to ensure thorough control of changes. In addition, to prevent the outflow of nonconforming products caused by mistakes in abnormality handling, the organization conducts its own abnormality-handling training called Red Rabbit Training.

As a result of these activities, sales increased 3.5-fold, from INR 6,089 million inFY2018, before the introduction of TQM, to INR 21.118 billion in FY2025. The number of customers increased from 30 to 64, while the number of delivery locations increased from 40 to 148. Thus, the various indicators of business objectives have steadily improved. Despite this rapid business growth, the average development lead time was reduced from 217 days to 84 days, while customer complaints were reduced by 77%. These are all excellent results demonstrating the effectiveness of utilizing TQM.

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デ ミ ン グ 賞

Tata Toyo Radiator Limited

代表者名：Mr. Narendra Chavan, Chief Executive Officer
所 在 地：Plot No. D 236/7, MIDC Chakan Industrial, Area Phase II, Village Varale, Taluka - Khed, Pune - 410501, Maharashtra, INDIA（インド）
T E L：+91 91-4500-3814
事業内容：各種用途向け熱交換システムおよび付属機器の設計・開発・製造・販売
自動車用熱交換システムの製造
売 上 高：公開不可
従業員数：2,727 名






[選考理由]

同組織は，インドの自動車産業発展に貢献するため，自動車向けおよび非自動車向け熱交換システムを供給することを目的として，インドのタタオートコンプシステム社と日本の東洋ラジエター社（現ティラド社）により 1997 年に設立されたタタオートコンプグループの一社である．自動車向けおよび非自動車向け熱交換システムの設計，開発，製造を行い，直接の顧客であるタタオートコンプをはじめ，自動車メーカ，2 輪車メーカへ供給している．従業員数は 2,727 名である．

同組織は，成長著しくかつ競争の激しいインド国内自動車市場において，挑戦的な経営目標と戦略を策定し，トップの強力なリーダーシップのもと，顧客要求に迅速に対応できる組織体質の構築や新製品開発力の強化をはじめ，全社をあげて積極的に TQM 活動を推進している．2019 年に TQM を導入して以降，経営目標・戦略の実現に向けて，TQM の仕組みの整備を進め，さらに顧客の要請を先取りする組織体質への変革に取り組んできた．

同組織の第一の特徴は，新製品開発力の構築である．既存市場の顧客要求と 2027 年度以降の成長市場を結びつけ，QFD，T-Matrix 等を活用して新製品開発を進めている．商用車では 36 MIS（Months in Service）の長期保証を実現し，EV 用高性能コンデンサー，新世代熱交換器等で成果を上げ，市場要求の探索から技術開発，量産化までを一貫して実行する組織能力を構築している．

第二の特徴は，全員参加の仕組みの構築である．同組織は，全社員の 79％を契約社員が占め，資質や教育水準のばらつきが大きいという条件の下で，全員参加型 TQM を成立させる独自の仕組みを構築している．具体的には，改善活動ごとにスタッフと作業者の役割を段階化し，各部門に TQM チャンピオンと運営委員会を設置して，現場内部で推進人材を育成する体制としている．その結果，新拠点立ち上げでは必要人員の 60％を社内登用で充足するなど，全員参加を支える組織能力が形成されている．

第三の特徴は，組織能力の意識的な把握と全社共有である．各活動を通じて獲得した成功事例，開発技術，問題解決のノウハウ等を組織能力として明示的に把握し，全社で共有・活用する仕組みを整備している．これにより，継続的な組織能力の向上を図っている．

以上の活動の結果，新規顧客獲得，競争力強化により，業績指標や各活動指標の多くが改善傾向にあり，経営目標・戦略の実現に向けて成果をあげている．特に，売上高，新製品売上高，コスト削減など重要な KPI において大きな成果をあげてきた．代表的なものとしては，売上高が 2019 年度比で約 2.3 倍と大幅に向上し，商用車部門で高い市場占有率を達成し，顧客クレームも 2019 年度比で約 60％低減している．

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Tata Toyo Radiator Limited

Representative : Mr. Narendra Chavan, Chief Executive Officer
Address : Plot No. D 236/7, MIDC Chakan Industrial Area,
Phase II, Village Varale, Taluka–Khed, Pune–410501,
Maharashtra, India
TEL : +91 91-4500-3814
Business : Design, Develop, Manufacture and Sales of Heat Exchange Systems & Accessories for all applications.
Sales : Not disclosed
Employees : 2,727



[Reason for selection]

The organization is one of the companies of the Tata AutoComp Group, established in 1997 by Tata AutoComp Systems Limited of India and Toyo Radiator Co., Ltd. of Japan (now T.RAD Co., Ltd.) with the objective of contributing to the development of India's automotive industry through the supply of automotive and non-automotive heat exchange systems. It designs, develops, and manufactures automotive heat exchange systems and related components, supplying them to its direct customer, as well as to automotive and non-automotive manufacturers. The organization has 2,727 employees.

In India's rapidly growing and highly competitive automotive market, the organization has established challenging management objectives and strategies and, under strong leadership from top management, has been actively promoting TQM throughout the organization. Since introducing TQM in 2019, it has developed and strengthened its TQM systems to realize its business objectives and strategies, while transforming itself into an organization capable of anticipating customer requirements.

The **first distinctive feature** is the development of new product development capability. By linking existing customer requirements with growth markets expected from FY2027 onward, the organization utilizes tools such as QFD and T-Matrix to promote new product development. In the commercial vehicle business, it has achieved a long-term warranty of 36 months in service (MIS) and has produced significant results with high-performance condensers for EVs and next-generation heat exchangers. Through these activities, it has established an organizational capability to consistently execute the entire process from identifying market needs through technology development and mass production.

The **second distinctive feature** is the establishment of a system for total employee participation. Under the challenging condition that 79% of its employees are contract workers, with considerable variation in their qualifications and educational backgrounds, the organization has developed its own mechanisms for realizing participative TQM. For each improvement activity, the roles of staff and operators are clearly defined according to different stages of development. In addition, it has developed TQM Champions and established steering committees in each function to develop TQM leaders internally. As a result, when launching a new plant, approximately 60% of the required workforce was secured through internal promotion, demonstrating the organizational capability developed to support total employee participation.

The **third distinctive feature** is the conscious identification and organization-wide sharing of organizational capabilities. Successful practices, technologies developed through activities, problem-solving know-how, and other knowledge acquired through TQM activities are explicitly identified as organizational capabilities and systematically shared and utilized throughout the organization. This enables the organization to continuously strengthen its capabilities.

As a result of these activities, many business and activity indicators have shown significant improvement through the acquisition of new customers and enhanced competitiveness, contributing to the realization of its business objectives and strategies. In particular, substantial improvements have been achieved in key KPIs such as sales, new-product sales, and cost reduction. As representative results, sales have increased approximately **2.3-fold compared with FY2019**, the organization has achieved a high market share in the commercial vehicle segment, and customer complaints have been reduced by approximately **60% compared with FY2019**.

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「測定の不確かさとその周辺
不確かさの表現のガイド（GUM）をめぐる 16 のおはなし」

榎原　研正　著

2025 年 8 月　一般財団法人　日本規格協会

［選考理由］

本書は，測定の不確かさについて，GUM（Guide to the Expression of Uncertainty in Measurement）を軸としながら，その背景にある考え方，統計的な意味，実務上の課題を幅広い視点から論じたものである．単に測定結果を一つの数値として受け取るのではなく，その数値がどのような測定過程を経て得られ，どの程度の信頼性を有するのかを理解することの重要性を，多様な話題を通して丁寧に説いている．

本書の大きな特色は，読者の理解に応じて内容を段階的に深める構成にある．前半では，身近な例や比喩を用いながら，測定，不確かさ，ばらつきなどの概念を啓発的に説明し，統計学や計測学を専門としない読者にもわかりやすいものとなっている．一方，後半では，統計学の枠組みを越えて，測定・計測とは何か，得られた数値をどのように捉え，解釈すべきかという本質的な問題に踏み込み，専門的な議論を展開している．同じ題材を繰り返し取り上げながら視点を変えて説明する工夫も，抽象的になりがちな概念の理解を助けている．このように，読みやすさと専門性を両立させ，測定という行為そのものを広い視野から考えさせる点に，本書の特色がある．

さらに，本書は GUM の内容を紹介し，その手順を解説することにとどまらない．長年この分野に携わってきた著者自身の経験，理解，問題意識が随所に反映されており，GUM の考え方について独自の解釈を示すとともに，時にはその前提や適用方法に対して批判的な検討を加えている．特に，統計モデルと不確かさを表現するモデルとの関係や，かたよりをどのように扱うかといった，実際に不確かさを考える際に避けて通れない論点について，形式的な説明ではなく，その意味に立ち返って考察している点も本書の価値を高めている．既存の枠組みをそのまま受け入れるのではなく，「なぜそのように考えるのか」「どこまで妥当といえるのか」を読者とともに問い直そうとする姿勢は，本書を単なる解説書とは異なるものとしており，深い示唆と感銘を与える．

品質管理は，事実，すなわち多くの場合データを出発点として行われる．したがって，その基礎となる測定値の意味や性質，信頼性を正しく理解することは，データを適切に読み取り，判断し，改善につなげる上で極めて重要である．測定値を単なる「与えられた数字」として扱うのではなく，その背後にある測定の仕組みや不確かさを意識することは，品質管理におけるデータ活用の質を高めることにもつながる．本書は，測定・計測への理解を深めることを通じて，品質管理に携わる人々がデータと向き合うための基盤を与えるものであり，品質管理の普及にも大きく貢献するものと考えられる．さらに，教育，研究，製造，試験・検査，標準化をはじめ，測定データを扱うさまざまな分野において広く活用されることが期待される．

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「JSQC 選書 40
病院だから TQM　デミング賞を通して見えたもの」

福村　文雄，立石　奈々　著

2025 年 9 月　一般財団法人　日本規格協会

［選考理由］

本書は，これまで製造業を中心に発展してきた TQM（Total Quality Management）を，医療という高度専門職集団に適用し，その本質と実践方法を体系的に示したものである．医療を取り巻く環境が急速に変化し，質・安全・効率の同時達成が求められる中，病院組織において TQM をどのように展開し，組織全体の活動として定着させていくかを具体的に示しており，医療における品質マネジメントの発展に大きく寄与する文献として高く位置づけられる．

本書は，まず医療を取り巻く環境変化や専門職集団としての病院組織の特性を整理し，病院で TQM に取り組む意義を明らかにしている．そのうえで，飯塚病院における QC サークル活動，ISO 9001 の導入，中長期計画の策定など，長年にわたる TQM 活動の歩みを振り返りながら，中長期ビジョン，方針管理，多職種連携など，病院全体で TQM を展開するための仕組みとその運用方法を具体的に示している．さらに，セル看護提供方式 ® をはじめとする現場改善の事例を通じて，TQM の考え方が実際の医療現場でどのように具現化されているかを示している．これらは，医療分野で初めてデミング賞を受賞した飯塚病院における長年の実践に裏づけられたものであり，理論と実践が高い水準で結びついている．

本書の意義は三点に整理できる．第一に，医療という複雑かつ専門性の高い分野において，TQM を単なる理論や個別の改善手法としてではなく，組織全体の経営・運営の仕組みとして具体化している点である．第二に，製造業で培われた品質マネジメントの考え方や手法をそのまま適用するのではなく，専門分化，多職種協働，個別性の高さといった医療の特性を踏まえて再構成している点である．第三に，デミング賞への挑戦を通じて，長年取り組んできた品質マネジメント活動を振り返り，課題を明らかにし，その課題に焦点を当てて自組織の TQM をさらに発展させていく過程を具体的に示している点である．このように，本書は先駆性と実践性を兼ね備えている．

以上述べたように，本書は，医療機関における TQM の一つのモデルを提示するとともに，長年にわたって蓄積された実践知を体系化した優れた文献である．医療従事者のみならず，サービス産業や品質マネジメントに携わる実務者・研究者にとっても有益であり，これから TQM やデミング賞に取り組もうとする組織にとっても多くの示唆を与える．医療分野における TQM の可能性を具体的に示し，品質マネジメントの今後の発展に大きく寄与する優れた文献である．

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「品質経営改革
自工程完結を良いモノ造りのプロセス整備から企業価値向上経営手法へ」

佐々木　眞一　著

2026 年 5 月　株式会社日科技連出版社

[選考理由]

本書は，著者のトヨタ自動車における技術者，品質保証担当者，国内外工場の品質保証責任者，経営層として積み重ねた経験を基礎に，品質を中核に据えた経営のあり方を論じた著作である。著者が提唱している自工程完結について，その考え方が形成された背景や実践に込めた思いを，実務者から経営層に至る自身の歩みを通して伝えている。品質経営講話会の設立や，大磯宣言 2023 に至る議論など，企業の枠を超えた活動も紹介されており，トヨタ自動車における実践と品質経営をめぐる幅広い議論を通して，今日の品質経営が取り組むべき課題と今後の方向を捉えることができる。

本書の特長は，実践に根ざした自工程完結の考え方を，製造現場から非製造部門，さらに企業価値向上を目指す品質経営へと展開している点にある。その出発点となるお客様第一，品質の工程保証，現地現物といった基本思想が，鋳造工程の直後に加工工程を設けて鋳巣の発生状況を可視化した改善など，具体的な事例を通して平易に説明されている。成功に至るまでの失敗や試行錯誤も記されているため，読者は著者の思考過程をたどりながら，品質保証の考え方と実践の要点を理解できる。

自工程完結をオフィス業務やサービス部門へと広げるにあたり，著者は品質の対象をモノの品質から，顧客が実現したいコトの価値へと捉え直し，自工程完結の概念を再定義している。顧客の成功を支えるビジネスや，自社のコア技術を生かした事業展開の実例は，価値提供の変化に応じて品質経営を発展させる方向を具体的に示すものである。さらに，経営行動と自工程完結のプロセスを対応づけて経営層から現場までの役割を明らかにし，組織能力の向上と仕事のプロセスの整備を，顧客価値の創造を通じた企業価値の向上へと結びつけている。現場の品質保証から経営の方法論へと議論を進める中で，コト価値の創造を支える TQM の新たな手法の必要性にも踏み込み，将来の研究・実践課題を提示した点に意義がある。

このように，現場の実践と経営の課題を結びつけた本書は，製造業の品質保証・工程改善から，技術・管理・サービス部門の業務改革，顧客の目的達成を支える事業への展開まで，幅広い活用が期待される。経営者や管理者が自組織の戦略，組織能力，業務プロセスを見直す際の指針となるとともに，品質管理を志す若手には，専門性を基盤として経営に貢献する実践者の姿を示している。品質経営や TQM の考え方を平易に伝え，次世代への思想と実践の継承にも資する本書は，品質管理の普及・啓発と品質経営の発展に寄与する著作として，日経品質管理文献賞にふさわしいと認められる。

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２０２６年度

デミング賞
受賞報告講演要旨

山田　　秀

慶應義塾大学　理工学部　管理工学科　教授

品質管理への関わりのこれまでとこれから

慶應義塾大学 理工学部 教授　山田　秀

1. きっかけ

2026 年度デミング賞本賞をいただけること，大変光栄に思います．本稿をまとめるにあたり，本賞の受賞は多くの方々に支えられていることを改めて実感し，心より御礼申し上げます．選考理由書では，国内や海外の学協会活動，国際標準化活動，教育啓発活動，研究成果が挙げられています．本稿では，品質管理へのきっかけを述べたのちに，これらについて述べたいと思います．なお，基本的にその当時の所属をもとに記述しています．

大学 4 年生への進級時に東京理科大学　狩野紀昭先生の研究室を志望した動機は二つあり，一つ目は，日本が品質の優秀さで世界のトップに上り詰めていた源の技術を学んでみたいという願望です．もう一つは，狩野先生が担当されていた科目である実験計画法です．構造模型と検定統計量，その期待値の構造などに興味を持ちました．

その後，修士課程進学と同時に日本品質管理学会 (JSQC: Japanese Society for Quality Control)に入会するとともに，日本科学技術連盟ベーシックコースに書記として参加させていただきました．宿題やテスト作成にも関わり，講師の方々，他大学の先輩や同僚との接点ができました．また，大学院修士課程時に化学プラントで 2 週間実習をする機会をいただき，東京理科大学　芳賀敏郎先生が開発された統計解析プログラムを持参し，その場でデータ解析をしたところ，私の面倒を見てくださった方が，対策がわかったと解析結果を誉めてくださいました．その直後にはなぜ誉められるのか明確にわからなかったのですが，その後腑に落ちました．これを通して，固有技術にデータ解析を加えると，新たな価値が生まれることを体験しました．卒業論文では多変量解析手法を線形代数から眺めていたのですが，このころから理論と応用の両輪を強く意識しはじめました．

当時はバブル経済の真っ最中で企業からの求人は多数ありましたが，修士課程での活動がさまざまな意味で楽しかったので博士課程への進学を決めました．きっかけは覚えていませんが博士課程では応答曲面法を勉強し始め，狩野先生のつてによりウィスコンシン大学マジソン校品質生産性センター長 George E. P. Box 先生を訪ね 2 ヶ月間短期留学する機会をいただきました．今でも拙い私の英語ですが，当時は初めての海外渡航であり，文字通りカタコトの英語なので，それに起因する困難の毎日でした．しかし私の特質なのでしょうか，先生，大学院生との交流は楽しく思いました．その頃から英語で意思疎通をする困難さを，結果が伝わる楽しさが上回っていました．大学院生時代，狩野先生からは研究だけでなく，品質管理の基本，グローバルな視点，論理的な判断などを学びました．

博士課程修了後，東京理科大学助手の 2 年目に，当時の人口統計をもとに幾つかのシナリオに基づき，大学進学希望者，進学者の長期予測を行いました．研究ではなく業務として初めてのデータ解析です．楽観的なシナリオでも団塊ジュニアの世代を過ぎると志願者数は減少し続け，当時の大学定員約 80 万人を近い将来に下回るという結果が出ました．当時にしては珍しく有期契約だった私は，将来に不安を感じました．日本人学生数が減ることは自明でしたので，これも海外での活動を考える大きなきっかけでした．

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2. 国内外学協会活動

(1) ANQ での学会発表の機会創出と Total Quality Science 誌の発刊

講師，助教授時代には，頻繁に海外学会に参加していました．国内の学会ではタグチメソッドに関する議論があるものの，私が研究対象としている実験計画法，特に，応答曲面法，最適計画，スクリーニング計画に関する議論はほとんどありません．一方，米国品質協会，米国統計学会などにはこれらの場があり，積極的に出かけていました．この経験は成長につながったという実感があり，国際学会に参加する機会を次世代の方々にも経験してもらいたいと思っていました．2001 年に，議長狩野先生，事務局長 東京大学　飯塚悦功先生の卓越した先見性とリーダーシップのもと，アジア品質ネットワーク(ANQ: Asian Network for Quality)が設立されました．JSQC をはじめ，アジアの国や地域の品質関連団体が加盟するネットワークです．ANQ には，東京理科大学　鈴木知道先生も関与されていました．鈴木先生とは，大学院生時代からの付き合いであり，日本酒を交えてなんでも話せる間柄です．ANQ での発表機会は欧米に行くよりハードルが低く，学生が発表する機会にしたいという思いを共有し，鈴木先生と共に ANQ にてさまざまな活動をしました．例えば，ANQ 全体を盛り上げるために Asian Recognition for Excellence, Quality Practice の創設や定常化などです．

JSQC には和文論文誌の品質誌があります．一方で，研究の成果を世界に発信するには英文の学術誌が不可欠です．そこで，ANQ での国際学会発表と連動した英文論文誌 Total Quality Science (TQS)の発刊に向け，科学研究費補助金の申請と取りまとめを担当しました．補助金をいただけることになり，電子投稿管理システムの導入やプロセスの仕組み化を行いました．創刊期には，投稿の確保，査読体制の構築，電子ジャーナルとしての公開方法など，さまざまな検討事項がありましたが，鈴木先生をはじめ多くの方から支援をいただきました．2014 年の創刊から 2018 年まで編集委員長を務めました．現在は，論文誌品質の編集委員長の任期終了後，TQS の編集委員長を 2 年間務める仕組みになっています．現在は，歴代の担当の方々により仕組みが年々成熟しつつあります．また，若手研究者や大学院生が英語の論文を発表する場としても機能していることをとても嬉しく思っています．

(2) ANQ 議長とコングレス開催

ANQ では，2023 年 1 月から 2024 年 12 月まで議長を務めました．議長初年度は ANQ 総会のホスト組織である Vietnam Quality Association of Ho Chi Minh City と連携し，コロナ禍後で初の対面開催を目指しました．学生の対面での発表機会は確保したいものの，さまざまな問題がありました．その際にも助けてくださったのが早稲田大学　永田靖先生，棟近雅彦先生です．お二人は，当時の JSQC 会長とその前の学側会長，ANQ 総会にたくさんの学生を送り出している研究室の主であり，さらに，私の愚痴も私とのお酒も許容してくださる寛容な先輩方です．議長としてどう動くべきか，学生のためにはどうするかなど，さまざまなご助言をいただきました．

2024 年 9 月には，私が勤務する慶應義塾大学で ANQ Congress Yokohama 2024 を開催することになりました．その時に特に助けてくださったのが，鈴木先生に加え，大阪大学

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森田浩先生，慶應義塾大学　山本渉先生，松浦峻先生，東海大学　金子雅明先生，拓殖大学　佐野雅隆先生，電気通信大学　加藤省吾先生，事務局の方々です．役割を，論文審査，総務，参加者コミュニケーション，全体・研究発表プログラム，会場設営，IT 活用に分け，これらの先生にご担当いただき，私の役割は何かあったら謝るというものでした．結果的に私が謝ったことはひとつもなく，これらの方々のお力で成功裡に終えることができました．

(3) 日本品質管理学会会長と日本クオリティ協議会会長

JSQC では，庶務，編集，標準，国際担当などの理事の後，2024 年 11 月から 2026 年 10 月まで会長を務めました．最も意識したことは JSQC の持続性です．JSQC が設立されて半世紀を超え，さまざまな活動がなされ成果も上げています．一方，課題としては，個人への依存，重い仕組み，経済的側面の懸念などがあります．同時に，学会には産業界の実務家と研究者が出会い，新たな価値を創出する場という役割があることも大切です．庶務担当理事の金子先生には会費検討，支部活性化をはじめ全般的な検討を，また学会員管理システムの導入では山梨大学　渡辺喜通先生に活動をリードしていただきました．

また日本クオリティ協議会(JAQ: Japan Association for Quality)は，JSQC 会長だった積水化学工業　大久保尚武氏，統計数理研究所　椿広計先生が起点となり，品質に関わる諸団体が連携して日本の品質の向上に取り組むことを目的に 2023 年に設立されました．私は 2024 年 11 月から会長を務め，設立間もない協議会が持続的に活動できるよう，加盟団体間の連携と活動基盤の整備に努めました．緩やかな連携を実現すること，加盟団体が持ち回りでシンポジウムを開催することを目的に，各種団体との調整を行いました．

振り返ると私が JSQC，JAQ などで関与した活動は，持続性，仕組み化，精緻化などが主なものであり，先達が築かれた基盤の上に成り立っています．

(4) これから

学協会活動を通して今後取り組みたいことは，品質管理を社会に正しく伝えることです．この問題意識は，慶應義塾大学で担当している講義での調査結果に端を発します．この講義は90分2コマで品質管理の歴史を扱い，受講生は文学部，経済学部，商学部，法学部，薬学部，理工学部の 1，2 年生が主体です．講義開始時に，品質管理について自分の考えに最も近いものを一つ選んでもらった結果が表 1 です．工場や製造部門の活動，最終検査，食品の品質保証，クレーム対応という選択肢 a から d を選んだ学生が例年 8 割から 9 割に達し，お客様の満足を追求する全組織的な活動や潜在要求を探索する活動と捉えた学生は 1 割前後にとどまっています．社会では，品質管理がその実態よりも狭く捉えられていると言わざるを得ません．

一方，品質管理のコミュニティでは，顧客を起点に，組織一丸となり全員参加で，事実に基づいて改善を続けるという素晴らしい実践が日々積み重ねられています．私は，この素晴らしい活動と成果を，品質管理のコミュニティの外にいる方々に広く伝え，品質管理の社会的価値を高めたいと考えています．これまで学協会活動を通していただいたご縁，

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大学での講義，講演や執筆など，さまざまな機会を利用して品質管理の本来の姿を社会に発信し，社会との密な関係を築けるよう努力したいと思います．

表1 品質管理について学生が持っている考えに最も近いもの1つ選択した結果

選択肢 ＼ 年度	2018, 2019計	2025	2026
a. 工場，製造部門の活動	300/339(88%)	280/342(82%)	337/383(88%)
b. 最終検査など特定部門の活動			
c. 食品の品質を保証する活動			
d. クレーム対応活動			
e. お客様の満足を追求する全組織的な活動	26/339(8%)	61/342(18%)	45/383(12%)
f. 潜在要求を探索する活動			
g. 全くわからない，その他	13/339(4%)	1/342(0%)	1/383 (0%)

3. 国際標準化活動

(1) きっかけ

初めて国際規格の開発に携わったのは，統計的手法に関する ISO/TC 69 でした．2002 年から ISO 9001 をはじめとする品質マネジメントシステム規格を扱う ISO/TC 176 に，当時の国内委員会委員長である飯塚先生からお誘いいただきました．ISO/TC 176 総会に参加し，飯塚先生の ISO/TC 176 における存在の大きさに驚きました．当時，ISO 9001:2000 が発行された直後であり，組織全体で品質を作り込む，改善を推進するという日本の TQM が盛り込まれたものになり，それに飯塚先生は多大な貢献をされたと推察します．

私の担当は，支援技術を担当する SC 3 というグループであり，そこでは大変なことも嬉しかったこともありました．私の役割は，我田引水的に規格開発を行おうとする提案に反対するというものです．ISO/TC 176 をはじめ多くの委員会では，コンセンサスベースで議論が進められ，決議に至る前に実質的に決まり，最後に決議を行います．私はその最後の決議の段階で，国際規格の無意味な増殖を根拠に反対をしますが，それが議決として採用されたことはありません．会議後 SC 3 メンバーが嬉しそうに談話をしているのに対し，私はポツンとその場で孤立していました．一方，嬉しかったことは ISO の会合が出会いで結婚したことです．その報告に対し，飯塚先生，棟近先生からは，心のこもった温かいお言葉，励まし，冷やかしをいただきました．

(2) 2015 年改訂エキスパート

多数のマネジメントシステム規格間の整合性確保と，マネジメントシステム認証の形骸化への対応という理由により，附属書 SL の導入が決まり，ISO 9001 の改訂作業が始まりました．当時の ISO/TC 176 国内委員会委員長は中央大学　中條武志先生，改訂エキスパートはテクノファ　須田晋介氏と私です．日本のポジションペーパーを作成する際，中條先生の構成力，コンセンサスベースで意見を醸成させまとめる力などに敬服しました．結果的に，固有技術の組織としての知識化，ヒューマンエラーへの対応などの導入が日本の

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意見の柱となりました．エキスパートとして日本の意見を ISO 9001 の要求事項に反映させるべく須田氏とともに努力し，100%ではありませんが取り入れてもらえました．

改訂作業の途中から，英国規格協会の手練れの手の上で踊らされているのに気づきました．と同時に，ビジネスを規格で変えることの政治的な手腕を新鮮な思いで見ていました．

(3) ISO/TC 176 国内委員会委員長

2002 年に ISO/TC 176 国内委員会委員となり，2012 年から副委員長，2022 年からは中條先生の後任として委員長を務めています．歴代委員長の国内外でのご貢献に比べると，まだまだ駆け出しです．現在，ISO 9000, 9001 の両規格が発行された直後です．今回の改訂では，ISO 9000 に関しては金子先生，佐野先生がエキスパート，ISO 9001 に関しては須田氏と私が引き続きエキスパートです．ただ私は，改訂作業の進捗を見守るタスクモニターという役割を担ったのでエキスパートとしての貢献は限られていました．

今後に向けて，国内委員会の体制強化，特に，産業界からの参加が課題と考えています．規格開発の議論の質を高めるには，品質マネジメントを実践している方々の知見も重要です．企業で品質マネジメントに携わっている方々に，国内委員会委員やエキスパートとして参画していただき，日本の実践を規格に反映するとともに，そのような方が規格を通して社会に長く貢献される体制が望ましいと考えています．

(4) 環境配慮設計，原子力品質保証

品質だけでなく，他にも標準化に関わっています．電気・電子分野の環境配慮設計を扱う IEC/TC 111 では，2005 年から国内委員会副委員長，2008 年から 2016 年まで委員長を務め，IEC 62430 の改訂にあたってはメンテナンスチームの主査を担当しました．品質マネジメント規格を主に扱ってきましたが，環境配慮設計の規格との共通点は事前の想定よりも多く，なんとか乗り切ることができました．

また，飯塚先生，棟近先生，中條先生に続いて，2026 年 1 月からは，日本電気協会原子力規格委員会品質保証分科会会長を務めています．始まったばかりでわからないことだらけです．この立場の難しさは，社会の安心感を得るということが強く要請されることです．原子力発電の顧客をどのように定義し，安全，安心感を高めるか，その際に規制当局とどのように連携するかなどが課題と認識しています．

(5) これから

日本は国際標準化というルール作りで後れを取り，ビジネスの機会を失っているとよく言われます．ISO/TC 176 における欧州，特に英国の動きを見ていると，私もそれを実感しています．英国規格協会は，規格の開発から認証，研修までを一体的に展開し，規格によって市場の仕組みそのものを形づくっています．2015 年改訂でエキスパートを務めた際に感じた政治的な手腕は，今でも ISO/TC 176 の随所に見られます．標準化は社会を変える力を持っているので，標準化を通して社会をよい方向に変えるとともに，持続する範囲で日本の企業が利益を得られるような標準化に関わりたいと考えています．

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加えて，標準化人材の育成も課題です．規格を作る側と使う側の双方を理解し，海外の仲間と議論できる人を増やす必要があります．品質に関わる人のキャリアには，企業内で改善を進める道だけでなく，国際標準化や認証，認定制度の適切な運用に関わる道もあります．その面白さを社会に伝え，参加しやすい機会を作りたいと考えています．

さらに，ISO 9001 の知名度も改めて高めたいと思っています．表 1 と同じ学生を対象に，ISO 9001 の知名度を調査した結果を表 2 に示します．2018 年に初めてこのデータを収集し，あまりの知名度の低さに驚きました．一方，日本適合性認定協会での研究会の調査では，消費者の多くは第三者の評価を参考に購買をしています．これから，ISO 9001 の存在を正しく社会に伝えることにより，社会が ISO 9001 認証による情報の利用価値を知り，結果的に知名度向上につながると確信しています．

表2 ISO 9001の学生における認知度

選択肢 ＼ 年度	2018, 2019計	2025	2026
a. 知らない，ほとんど知らない	185/222 (84%)	270/346 (78%)	293/371 (79%)
b. 名前を聞いたことがあるが内容は知らない	23/222 (10%)	39/346 (11%)	47/371 (13%)
c. 品質マネジメントの国際規格なのは知っているが内容は知らない	14/222 (6%)	35/342 (10%)	27/371 (7%)
d. 内容や第3者認証制度に基づく活用を多少知っている	0/222	2/342 (1%)	4/371 (1%)
e. 要求事項の内容も多少わかる	0/222	0/342	0/371

4. 教育啓発活動

(1) デミング賞委員会，QC サークル，QCS 組織委員会

2003 年からデミング賞審査委員会委員として 23 年間，2018 年からは副委員長として 8 年間，審査に関わってきました．受審組織の経営方針が現場の仕事にどう結びつき，どのような成果を生むかに直接触れる機会は，私にとって TQM に関する勉強，研究開発の機会です．この制度が今後も日本の企業や組織の発展に役立つよう，努力したいと思います．最近，日本科学技術連盟内に ISO→TQM 研究会が設立されたと聞きました．2018 年の JSQC ニューズにて，10^2と10^4をつなぐ第三者認証制度というタイトルで発信したとおり，以前から，ISO 9001，日本品質奨励賞，デミング賞へという流れがあればいいと漠然と思っていました．今回の研究会設立は，とても良い機会になると思います．

QCサークルでは，京浜地区世話人を6年間務め，現在は関東支部世話人の2年目です．まだ勉強中ですが，活動の中心は現場で働く方々にあると実感しています．自ら問題を見つけ，仲間と工夫し，発表を通じて互いに学び，仕事への誇りや生きがいを得る．これは石川馨先生が目指された QC サークルの大切な理念であり，次の世代にも残すべきものと思います．

さらに，日本科学技術連盟の品質管理シンポジウム（QCS）組織委員として，社会に役立つ品質管理の新しい実践を探る議論に参加しています．QCS 組織委員の役割は，それぞれの立場から日本の品質管理が繁栄する方向を考え，それをシンポジウムに落とし込むことと認識しています．2025 年の主担当組織委員時には，品質管理のこれまでとこれか

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らをメインテーマに取り上げ，さまざまな知見を得ることができました．今後それを精緻化し，広く発信し多くの組織で実装してもらうために努力することが課題と考えています．

(2) 企業での実践，教育セミナー

日本科学技術連盟　安藤之裕氏とともに，企業への TQM 導入に関わる機会がありました．TQM の考え方を理解しているつもりでも，それを個々の組織の事業や風土に合わせて具体的な仕組みや活動に落とし込むことは容易ではありません．安藤氏の歯に衣着せぬ独特な説明と，それによる組織への落とし込みは新鮮でした．同じようにやってみたいと少しだけ思いますが，未だにできません．

教育面では，日本科学技術連盟の実験計画法セミナー運営委員会委員長を 2002 年から 2024 年まで 22 年間務めました．このセミナーがきっかけで，実験計画法により因果を推測し技術開発に役立てる事例が複数生まれたと信じています．

また，このセミナーの運営委員である実務家の方と執筆した書籍が，2024 年度日経品質管理文献賞を受賞しました．この時に，愛知工業大学　仁科健先生が他文献で同賞を受賞されました．仁科先生には，テクノメトリクス研究会，ISO/TC 69/SC 4 などさまざまな活動で優しく見守っていただいています．執筆者，仁科先生と一緒に，同時受賞祝賀会を温泉で開催し楽しく過ごしました．

(3) これから

QC サークル活動について，持続性の確保が直面する課題です． QC サークル活動は，日本の現場を支える重要な基盤の一つです．一方で，現在の仕組みは，運営する側にも参加する側にも重くなっているように思えます．必ず確保すべきは，QC サークルのメンバーにとって，社内，京浜などの地区，関東などの支部，そして全国へと，発表の機会が上に続いていることです．この機会が現場で働く方々の励みとなり，成長の場となっています．その一方で，これを支える体制は変えなければ持続しません．また，経営トップに QC サークルの重要性を理解していただくには，その効果をデータで示す必要があります．

5. 研究活動

(1) 研究の原点：テクノメトリクス研究会と実験計画法

博士(工学)の学位取得以降の研究の原点は 2 つです．一つ目が JSQC のテクノメトリクス研究会であり，これは椿先生，東京工業大学　宮川雅巳先生，永田先生らが中心となって立ち上げられたもので，私は発足数年後にメンバーに加えていただきました．討論とその後の宴は刺激的でした．また，宮川先生，永田先生が多数書籍を執筆されているのに憧れていました．これを起点に，表紙に名前があるもの 17 冊を含め現在 25 冊の上梓に関わっています．

もう一つの原点は実験計画法であり，これは次に詳細を述べます．

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(2) 自分で研究する時代

海外の実験計画法の研究者との議論は，とても刺激的でした．特に，ペンシルバニア州立大　Dennis K. J. Lin 先生との議論や研究です．初めて Lin 先生にお会いしたのは博士課程の短期留学時であり，彼の明るさと前向きさと推進力に惹かれました．過飽和実験計画について興味を持ち，共著論文を執筆しました．私の初の海外誌掲載は，Lin 先生との共著論文です．

そのころ，もう少し数理的に綺麗にならないかという漠然とした問題意識を持っていました．それに対し，目から鱗が音を立てて落ちるような貴重なご意見を多数くださったのが東京大学　松井知己先生です．Lin 先生，松井先生ともに，明るく，好奇心がありまたお酒が好きです．私はそのような方に憧れると同時に，かくありたいと努力するようです．

また，私の関わった査読付き学術論文のうち，40 歳くらいまでは全てが筆頭著者でした．これは，良く言えば自律的，悪く言えば協調性がないことの表れです．

(3) 社会人学生の問題意識に基づく研究の時代

2004 年 4 月から 12 年間，筑波大学ビジネス科学研究科に勤務しました．筑波大学ビジネス科学研究科は，夜間社会人大学院であり研究テーマは学生の経験に基づく問題意識をもとに設定します．筑波大学着任時に椿先生と同僚になり，このスタイルでの学生との研究や，大学のマネジメントを学びました．その時に，多数の優秀な社会人大学院生と研究を進めました．システム安全，環境配慮設計，自治体におけるゴミ収集管理，技術ソフトウエア開発，医薬品研究開発プロセスマネジメントなどです．これらの多岐にわたる課題に，データで語る，プロセスのマネジメントなど，品質管理の基本原則の立場から研究に関わっていました．

(4) 理工学部学生と研究する時代

2016 年 4 月に慶應義塾大学に着任以来，優秀な学生たちと品質管理，実験計画法に関連してさまざまな研究をしています．シミュレータのサロゲートモデルの構築，自然言語処理の品質管理への応用，有限要素解析を用いたアキレス腱のひずみに関する研究，バナナの追熟などです．学校教育への TQM の適用として，Global Indian International School と共同研究契約を結び，我々はデミング賞評価基準に基づく学校向け TQM モデルや，日々の学習データに基づく日常管理などを提案しました．

実験計画法に関しては，過飽和実験計画，スクリーニング実験計画，コンピュータ実験計画という私が 40 年近く携わってきた道で学生たちが中心となり大きな成果を上げてくれています．予想外の大きな成果が多数あります．例えば，通常は行列で表現する実験計画を多項式で表現して見通しをよくしたものや，成り立つと思っていた過飽和実験計画の性質をより一般的な形で証明したものがあります．

(5) これから

前述の(3), (4)の研究成果は，優秀な研究室のメンバーによるものです．今後の研究について，定年までのあと 3 年と少しは今の研究の進め方を貫きます．その後の進め方につい

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ては，まったくイメージができていません．しかしテーマとしては，品質管理の正しい理解の促進，標準化戦略の実践と人材の育成，ISO 9001 の知名度向上，QC サークル制度の持続性確保などに，研究として腰を据えて取り組みたいと今は考えています．

6. おわりに

今回の受賞にあたり，これまでにどのような活動をしてきたかを振り返り，学協会，国際標準化，教育啓発，研究などさまざまな活動を行ったと感じています．幅広さは多少あると思う反面，先達の方々に比べて活動の深みが全く足りないなと実感しています．活動の成果は図 1 のように，活動の深さと時間との面積と捉えることができます．私の頭のシャープさは，平均的なものです．したがって縦軸方向である活動の深みは，私の能力というよりも，前述のとおり多くの方々の支えによるものです．そのような意味で今回の受賞は，これまでの功績というよりも今後の活動への励ましと受け止めています．

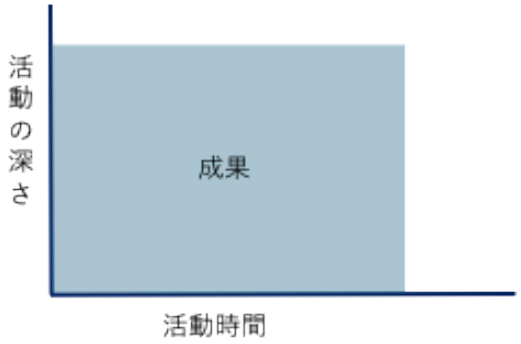


図 1　活動の成果＝深さ×期間

私の唯一の取り柄は体力であり，健康であることです．理工学部の大学教員である私が，今後について体力勝負に持ち込もうと宣言するのもいかがなものかと思います．しかし，これぱっかりはどうにもなりません．博士論文の審査の際，東京理科大学　吉村功先生が私のコメントへの対応力を誉めてくださっていたと，後に他の方から伺いました．これを耳にして以来大切にしているのは，じっくり考えて要請を見極め，それに正面から応えて前向きに活動することです．これが私にできることです．今後，品質を中核に社会に貢献するために，大義を胸に，謙虚に長く活動したいと思います．

最後に，これまでご指導いただいた方々，ともに活動してきた方々，関係者の方々などに心から感謝申し上げます．また，私が明るく行動できる源である妻 麻季にも感謝を伝えたいと思います．紙数の都合上，すべての方のお名前を挙げられないことをご容赦ください．

改めて，皆様にお礼申し上げます．ありがとうございました．

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２０２６年度

デミング賞
受賞報告講演要旨

宮本　眞志

トヨタ自動車株式会社
カスタマーファースト推進本部　本部長,
Chief Quality Officer

絶え間ない「お客様目線」の追求

（「品質第一」「お客様第一」最優先の人・職場づくり）

トヨタ自動車株式会社 カスタマーファースト推進本部 本部長
Chief Quality Officer
宮本　眞志

この度は、このような栄誉ある賞を賜り、身に余る光栄と存じますと共に、その責任の重さを痛感しているところです。デミング賞委員会の皆様、日本科学技術連盟の皆様、日頃よりご指導ご支援をいただいている全ての関係の皆様に改めて感謝申し上げます。

１．私と“品質”の関わり

私と品質の出会いは、1983 年にトヨタ自動車に入社して直ぐに訪れました。子供の頃からモノづくりが好きだった事もあり、設計や研究・実験分野ではなく工場を希望し、配属されたのが高岡工場検査部（今で言う品質管理部）でした。モータリゼーションの当時は、不良によって生産ラインを停止させることがないよう、「不良を一刻も早く顕在化して、一刻も早く直す」これが課せられた仕事でした。その日の夜勤で問題起こると、事務所の前に生産された車が多数駐車されており、原因究明と対策に追われるのです。

仕入先さんにお願いしている部品の品質を如何に安定させるか、工場の中のプレス加工や溶接、塗装、組付けの工程能力を如何に上げるか、この戦いの日々だったことを思い起こします。

そこで学んだ事は、
① 早く問題を顕在化する事が品質を良くする
② 品質を良くすると楽になる・儲かる
こうして、工場から出荷される車両の品質確保に向き合う毎日でした。

しかしながら、解決しても解決しても問題は無くならず、楽になる事はありませんでした。ふと、問題解決ばかりでは問題は無くならない、問題が出ない様な図面と工程づくりに参加すれば楽になるのではと考え、設計部署に通い一緒に図面を検討する行動に変えました。品質を良くする事とは、出た問題を解決するより、問題が出る前の図面の段階で顕在化し解決する事が、より効果的であり、より儲かることを理解しました。

そして、トヨタも海外進出の時代を迎え、米国 NUMMI（GM との合弁会社）に赴任し日本で経験した事を米国人と一緒にやる事になりました。まったく上手くいきません。文化が違う、何よりも自分の責任範囲を明確にし、それ以上の事には手を出さない。つまり、「品質第一」「お客様第一」の捉え方が狭く、品質管理の担当が設計と一緒に図面を良くする行動は皆無であり、これに苦労した事を思いだします。
故に、日本の品質管理、QC による改善、当時の TQC の素晴らしさに感動しました。

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日本と米国で工場でのモノづくり、品質管理や品質向上活動とは何かを経験し、帰国後、品質保証部にて品質向上活動の仕組みづくりや海外工場のガバナンス、そして、お客様ご指摘の品質問題の解決推進を担当する事で、現場に役に立つ品質保証のルールや仕組みづくりを学び、同時にお客様を強く意識し始めた頃だったと思います。

工場時代には、製造時の品質管理は勿論の事、何重もの出荷検査を実施し、お客様には満足にお使い頂けているつもりでしたが、日々寄せられるお客様からのご指摘や苦情の多さに、改めてお客様第一の大切さを痛感した次第でした。

2．お客様目線とトヨタの歩み

この頃からトヨタの歴史について勉強を始め、豊田佐吉や喜一郎の創業の時から、トヨタの DNA は「品質第一」「お客様第一」、何故これが大切なのかを改めて考える様になりました。

トヨタは、モータリゼーションの頃、品質で苦しんだ時期があり、これが経営をも苦しめていた事、そして、日本科学技術連盟さんのご支援を受け、1965 年にデミング賞に挑戦した事で、品質管理の仕組みや品質第一の風土が醸成され、この後のトヨタの成長に繋がった事などを学び、品質向上は社会のためになると、私にとって品質の面白さに気がついた時期でした。

3．お客様目線は何故必要か？

トヨタは創業以来、約 20 年に一度大きな失敗を繰り返しております。古くは初代クラウンを発売時に、直近では一連のリコール問題、そして認証問題です。90 年代後半から自動車産業の競争が激化し、トヨタも海外進出続け、工場の数や生産台数と人員が急激に増えた状況下その中で、2009 年の米国リコール問題が起きました。

この時私は、お客様品質部長として、グローバルで車両の出荷品質保証と市場品質問題の解決推進の両方の責任者として、長年、「品質第一」「お客様第一」を軸に活動して来たはずなのに、何故この様な事になってしまったのか？　何が足りなかったのか？　非常に悩みました。



図 1　「お客様目線」がなぜ必要か

2009 年 8 月、米国でトヨタ車が暴走し、4 人の方が亡くなられるという痛ましい事故。この一件の事故をきっかけに、当時の豊田社長が米国公聴会に出廷するなど、トヨタの経営を揺るがす事態へと発展していきました。3 件の市場処置を実施するも、トヨタ車の意図せぬ急加速への不安は、技術的な説明だけでは払拭する事はできませんでした。

そこで必要だったのは、技術的な説明だけではなく、お客様に安心していただく対応、すなわちお客様目線での対応でした。最終的に、開発中の車だけでなく、市場流動車両にもブレーキ制御を優先するシステムを装着する処置を実施しました。お客様期待値を十分把握できていなかった事から、お客様の安心感という期待値に届いていなかったのではと思います。「お客様第一」の大切さが身に染みた瞬間でした。

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4．リコール問題からの学び

米国公聴会の後、何が足りなかったのか全社で振り返る為に、グローバル品質特別委員会を立ち上げ、車づくりの全てのプロセス、お客様対応の全てのプロセスがお客様期待値に合致しているのか？　見直しと再発防止に取り組みました。

「急成長の中で経営の優先順位が崩れていたかもしれません」

「成長のスピードが人財や組織の育成スピードを上回った結果、品質問題を起こした」

「お客様の期待値が充分わかっていなかった？　感度が低かった？」

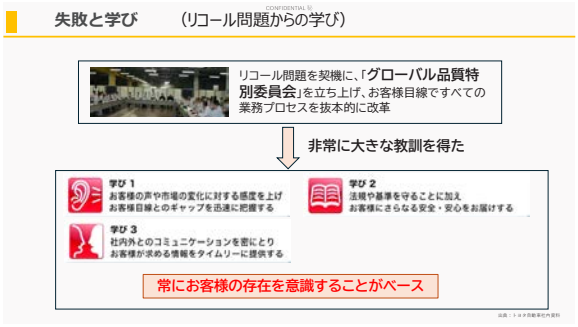


図 2　リコール問題からの学び

本質課題は身の丈を超えていたこと、人財が育っていなかったこと、そして、気づいていたのにアンドンの紐が引けなかったことです。さらに根っこにあったのは、お客様の存在を意識できなくなっていたのではないか？ということでした。

5．お客様の期待値を知る　CQO の設置

ここからは、その学びとして、２つの取り組みを実施しました。先ずは、お客様の期待値を「知る」取り組み、次に、この学びを「風化させない」取り組みです。

品質確保とお客様の期待値を知るグローバルな体制を構えました。各地域のことは、その地域の方々にしか分かりません。そこで各拠点に CQO(Chief Quality Officer)を設置し、地域の実情に合わせたきめ細かな品質向上活動を行っています。北米、欧州、中国、アジア、中南米、インド・中東、アフリカ、オセアニアなど、各地域に CQO を配置しました。CQO の役割は、「眼」「耳」「心」で地域のお客様の笑顔につなげること。具体的には、地域品質保証体制の整備・強化、地域の品質リスクマネジメントの定着、そして有事の際には地域の緊急対応の指揮を執り、グローバル CQO と対応を議論します。狙いは、地域のお客様の声を直接お聞きし、アクションに繋げることです。

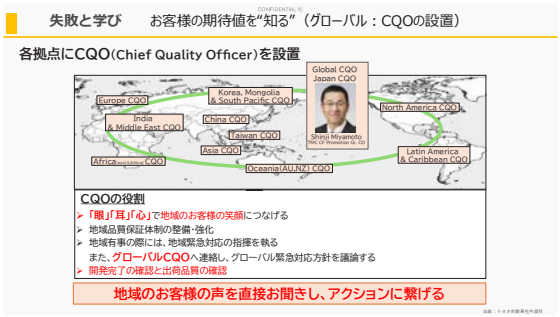


図 3　CQO の配置と役割

6．風化防止　品質学習館の設置

次は、お客様の期待値を社内に伝え、この学びを風化させない取り組みです。「品質学習館」を設立しました。

問題を起こした時には学びを活かし再発防止を実施しますが、時と共に風化が始まり、20 年も経つと社員の半分が入れ替わり学びが伝承しにくくなり繰り返すのです。これを防ぐ為に、伝承館ではなく学びの場として学習館を本社の中心地に設置しました。

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人はどうしても仕事に追われると、直ぐに結果の出ない品質より、納期や直ぐに目の前に現れる KPI を追ってしまいます。この時に、この場を訪れて頂き、「品質第一」「お客様第一」に心を戻すのです。毎年、必ず「トヨタ再出発の日」と称して、この日は全社員が品質の神社・仏閣である学習館を訪れ、自分の心に向き合います。

加えて、職場での活動として「語り部活動」も実施しております。リコール問題の学びを、自職場に置き換えて伝承する取り組みを、「語り部」が進めております。人が入れ替わっても問題が繰り返さないためには、職場の中での人づくりが大きな意味を持つと思います。現在、全社で 120 名ほどが活動中でして、私も当時を知る者の一人として、カスタマーファースト推進本部の中で伝承に取り組んでおります。

もう一つは、毎週実施している品質朝会です。各カンパニー・各本部のトップマネジメントが一同に会し、各地域から上がってくる品質問題及び各職場から上がってくる困りごとを、即断即決で対応を決めます。狙いは、機能軸を超えた「お客様第一」の実践、スピード重視、そして品質への向き合いの強化です。お客様の困りごとを素早く社内に伝え、組織の壁を越えた連携で全社一丸となって進めています。極々当たり前の事ですが、こうした取り組みを継続する事で人財育成の場として大きな役割を果たすようになってきました。



図 4 風化防止の取り組み

お客様の期待値を直接知る一つの手段として、トヨタ販売店から定期的にお客様の期待値をお伺いする機会を設けております。60 年以上の歴史を持つ「お客様第一」の活動です。お客様に一番近いのは販売店です。販売店の現場で起きている生の声、困りごとを直接いただき、メーカー側の対応につなげています。データとして上がってくる情報だけを見ていると、数字の裏にあるお客様の感情が抜け落ちてしまう為、生声を「聞く場」を仕組みとして持っておくことがお客様の期待値を「知る」非常に大事な手立てだと考えています。

この様な学びと施策は、トヨタだけのものとせず、オールトヨタ TQM 大会等の機会を通じてトヨタグループはじめ関係各社に拡大しながら進めております。

7．お客様第一と品質

品質とは何か。お客様の要求・期待と、自分たちの実力・力量との「ギャップ」です。大事なのは、お客様の期待は絶えず変化し、しかもこちらが勝手に決められないということ。決めるのはお客様です。一方、自分達の実力は自分たちで決められる。だからこそ、変化に追従し続けなければなりません。

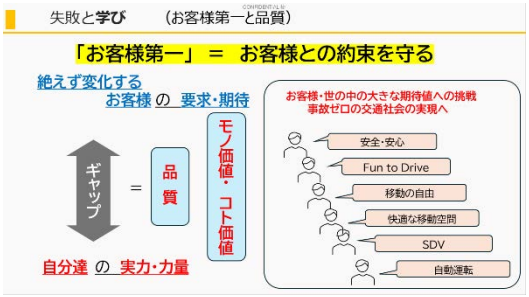


図 5 お客様第一と品質

これは、モノの質だけの話ではなく、モノを生むプロセス、設計も、考え方も、事務や管理の仕事も同じです。仕事には必ず相手がいて、相手には期待値がある。その期待値

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どおりに仕事ができているかを常に問い直し、ギャップがあれば埋めていく。「お客様第一」とは、お客様との約束を守ること、全ての業務に関わる経営の基本です。

トヨタ自動車は年間約 1000 万台を製造しており、全ての評価をクリアーしてお客様に満足頂けると判断して出荷しておりますが、法規とか基準だけクリアーしていてもやはりお客様からご指摘頂きます。従って、もっと心配性になって、常に、お客様の期待値に合致しているかどうかを検証し続ける事が重要だと思います。

8. 品質経営に欠かせないもの（繰り返す品質問題 変わらない本質課題を断ち切る為に）

トヨタは先程述べました様に２０年毎に品質問題を繰り返してきており、２０年も経過すると組織の半分の人が入れ替わり、今ではもっと早く５年１０年かもしれませんが学びの伝承が困難になるという事だと思います。

これを断ち切る為に、先程の２つの施策、仕組みづくりと風土づくりに取り組みました。加えて、もう一つ重要な考え方の徹底を社内で始めました。「モノづくりの順番を守る」ことです。安全な職場をつくる、工程も安全な工程をつくる、法令順守は勿論です。そして同時に、品質確保を優先する。品質が確保できれば必ず売れて量がでる。そして、必然的にコストが下がって儲かる。このモノづくりの順番を守る事が品質経営そのものだと思います。その為には、これを守れる人づくりが欠かせません。

9. ものづくりは人づくり

戦後の苦しい時期を経て、トヨタを世界的な自動車メーカーへの歩みを支えたのが、トヨタ生産方式 TPS です。TPS は、ムダを徹底的に排除し、短いリードタイムで、お客様に良いものを、低コストで、確実に届けるための考え方であり、この為には品質確保が不可欠でした。そこで、TQC やデミング賞への挑戦と言った TQM 活動を推進し、これが無ければ現在の「品質のトヨタ」は無かったと思います。この時に、日本科学技術連盟さんにお助け頂き、現在まで大変お世話になっております。

トヨタ自動車は 1965 年デミング賞を受賞し、デミング賞選考委員会資料に、「創業者である豊田佐吉翁の“品質を第一にする”という遺訓を全役員が受け継ぎ、全社一致団結して総合的品質管理によってこの遺訓の実現をはかる、という信念をもって協力に推進した」と評価頂きました。

トヨタの品質経営の神髄を一言で申し上げれば、「お客様第一を起点に、人間性尊重の考え方のもとで、全員参加で品質をつくり込み、問題を見える化し、改善を回し続けること」にあると思います。品質経営とは、製品を良くする活動であると同時に、その過程で人と組織を強くする活動であります。そこが TQM 活動ですし、トヨタの本質であり、忘れてはならない活動と考えております。

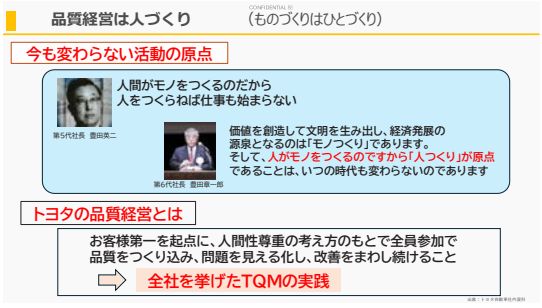


図６　トヨタの品質経営

歴代社長の豊田英二や豊田章一郎は、この本質を受け継ぎ、常に、「人がモノをつくるので、人づくりが原点」とぶれずに人財育成（TQM活動）を実施してきました。

私は、これが現在のトヨタらしさ、TQM が特別な活動ではなく、日常の仕事そのもの

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にする為に、風化させない為に、お話させて頂いた活動を推進してきました。

１０．品質経営は人づくり

人づくりが会社の品質経営を左右すると言っても過言でなく、長期的に成果を出して組織力を高める為に、「部下が自ら考え、判断し、行動できるように人財を育てる」ことがより重要で求められる事だと思っております。仕事の合間に人財育成ではなく、人財育成の合間に仕事する。つまり、上司の最も重要な仕事は部下を育てる事と言う、欧米のスタイルと異なるマネジメントスタイルが、現在の日本の競争力を生んだと言っても過言ではないと思います。

モノづくりは人がやるものであり、パーフェクトを追い続けるが、現実的にはそれはあり得ません。何か間違いが見つかれば、直ぐに立ち止まって真因を追求し、手を打ち、二度と繰り返さない様に再発防止を徹底する。この改善活動を限りなく繰り返す過程で人づくりをする。これがトヨタの文化であり、この実行が「トヨタの品質経営」だと思います。

トヨタには「事象は憎んでも人は憎まず」と言う文化があり、耳の痛いことも受け止め、失敗を責めるのではなく、そこから何を学ぶかに軸足を置く事を重要視しております。人づくりは時間のかかる取り組みですが、強い組織をつくるうえで最も大切であり、この為には人と人とのコミュニケーションが、時代が変わっても大切だと思っております。

同時に、部下が率直にものを言える環境をつくることも上司の大事な役割です。問題や不安を口にしづらい組織では人は育ちません。経営トップの意思、現場の実行力、部門間の連携、人財育成、風土づくりそのすべてが品質に反映され、常にお客様に期待通りの価値を届け続けられる企業である為には、それを担う人づくりが大切なのです。

１１．人間は弱い動物

長い間、この品質の世界に身を置き、モノづくりの順番を守る事を第一に、それを守れる人づくりを目指して常に行動する中で、痛切に感じた事があります。

① 常に、アゲンストの風に向かっていた？？？
　ヨットの様に、アゲンストの風を如何に利用するかが TQM 活動、、、

②「人間は弱い動物」、ということです。

先程、ものづくりの順番は安全、法規・品質、量、コストだと申し上げました。この順番を守ろうと努力はしますが、人間は、本当に守れないんだと実感しております。

何故か？　量も、収益も、納期も、仕事をしているとその場ですぐ結果が数字で見えるからです。一方、品質は、その場で結果が分かるものもありますが、全部壊さないと分からないものや、5 年後 10 年後に分かる耐久的なものは、その場では見えません。だから人は、どうしてもその時に見える数字、見える結果を優先してしまう。それは、周りから評価されたい自分がいるからなのです。

マネジメントは、この順番を守れない事を責めてはいけないと思います。大事なのは「人とはそういうものだ」と理解した上で人と物事を見ることです。現場任せにせず、トップマネジメントこそ率先してものづくりの順番守る事が重要です。

トヨタも道半ばですが、常に、トヨタ自動車の社員 39 万人全員に、ものづくりの順番（安全、法規・品質、量、コスト）を守る事と、これを守れる人と組織をつくる事を愚直にやり続けてきました。

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私の 44 年間の使命は、これを忠実に守ってきたことであり、その事が現在のトヨタに繋がって来たと思います。

１２．最後に

長く品質に関わった私が痛感しましたのは、今後、お客様の期待値が広がり高度化していく中で、企業として如何にお客様との約束を守り続け、信頼され続ける事が価値であります。これを品質経営として実践するには、当たり前かもしれませんが、人を大切にする事、現場で知恵を出して改善を続ける事、何よりも、「品質第一」「お客様第一」をぶれずに実践できる人づくりを実践する事、これらが欠かせないと言う事でした。

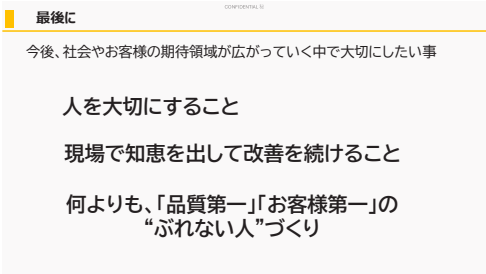


図 7　「お客様第一」「品質第一」の実践

１３．謝辞

足掛け４４年、品質にどっぷり浸かった会社生活は激動ではありましたが、多くの学びを得ることが出来、大変幸せだったと思います。この間、私が痛感しましたのは、お客様の期待値が広がり高度化していく中で、企業として如何にお客様との約束を守り続け信頼され続ける事が価値であり、これを品質経営として実践するには、人を大切にする事、現場で知恵をだして改善を続ける事、何よりも、「品質第一」「お客様第一」をぶれずに実践できる人づくりが欠かせないものと言う事だったと思います。

これも、「品質第一」「お客様第一」の DNA を残してくれた創業以来の諸先輩恩師の方々、私の活動を後押し頂いた豊田会長はじめトヨタ自動車トップマネジメントの皆様、そして何より苦労を共にし、共に努力頂いた多くの仲間の皆様に深く感謝申し上げます。皆様のお支えが無ければとても成し得なかったと思います。

又、デミング賞委員会及び日本科学技術連盟の多くの関係者の方々に、この場をお借りして心より厚くお礼申し上げます。この度は、誠に有難うございました。

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２０２６年度

デミング賞
受賞報告講演要旨

PT. Cataler Indonesia

1. Company Overview

1.1 Introduction

The Cataler Group is the world's fourth-largest automobile catalyst manufacturer, mainly with emission control catalysts for four-wheel and two-wheel vehicles. PT. Cataler Indonesia (CIC) was established in October 2011 as the group's fifth overseas company. CIC manufactures and supplies for an emission gas purification catalyst for four-wheel and two-wheel vehicles, primarily manufacturing and selling catalysts to Japanese customers who hold a high market share in Indonesia.

1.2 History

Table 1.1 Company Overview

Established	October, 2011
Capital	USD 15 million
Shareholder	Cataler Corporation 95%. Cataler (Thailand) Co., Ltd. 5%.
Land	50,000 m2.
Building	6,276 m2.
Employee	121 (February 1, 2026)

Table 1.2 CIC History

2011	Established in October 2011.
2013	Started producing 2W catalyst.
2015	Started producing 4W catalyst. Obtained ISO/TS16949 certification.
2016	Obtained ISO14001 & ISO18001 certification.
2019	Obtained ISO22301 certification.
2024	Received TQM Diagnosis.

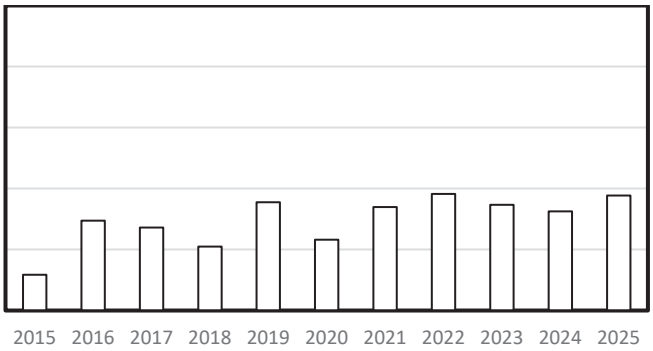


Figure 1.1 Sales volume of 4W catalyst

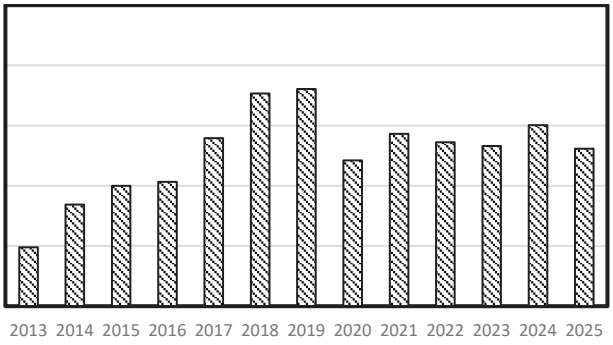


Figure 1.2 Sales volume of 2W catalyst

1.3 Catalysts and unique characteristics

"Catalyst" an exhaust emission control device that reduces toxic substances from an internal combustion engines—namely, Hydrocarbon, Carbon Monoxide, and Nitrogen Oxide are transformed into and harmless pollutants ; Nitrogen, Water, and Carbon Dioxide by the oxidation and reduction reactions.

2. Organization, Roles, and Responsibilities

2.1 CIC Organizational / Roles and Job Responsibilities

CIC is composed of 10 functional sections.

Within the quality assurance system, roles are clearly defined. Since all of CIC's business involves transactions with Japanese customers, in each process of the quality assurance system, CAC is responsible for sales, advanced development, and product design, while overseas offices handle quality assurance during production preparation and mass production following product DR. (Figure 2.1)

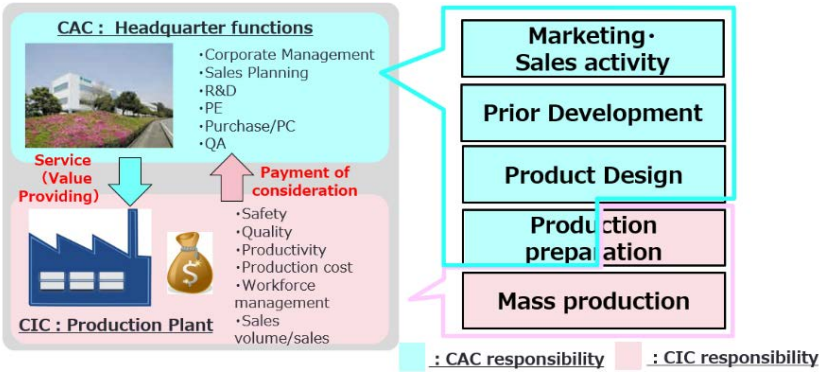


Figure 2.1 Roles in the Quality Assurance System

2.2 Quality Confirmation in the Market

Quality confirmation in the market is conducted in cooperation with each OEM when handling complaints from general consumers and during periodic product surveys from the market.

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Through these two methods, the market quality of catalytic converter products is properly monitored.

3. Management Objectives and Strategies

3.1 Business Environment Changes surrounding CIC

3.1.1 Economic Conditions and National Policy in Indonesia

Indonesia has the world's fourth-largest population and has the potential to grow into a massive market in the future. The Indonesian government has set a national vision to become the world's top-level economy on GDP by 2045, the 100th anniversary of the country's independence. The government is actively promoting the expansion of domestic production and domestic demand in industries such as automobiles.

3.1.2 Market Conditions and Customer Trends

Due to government policies, the market share of EVs and HEVs is expanding, and the blending ratio of biofuels with gasoline and diesel fuel is also increasing. OEMs, which had previously sourced parts from overseas, are now beginning to require parts manufacturers to produce locally (localization). These trends represent new business opportunities for CIC.

3.1.3 Analysis of Competitors

While major global competitors have production bases around the world, few companies have factories in Indonesia. CIC is formulating a strategy to expand its exhaust catalyst business by leveraging the strengths of its domestic presence and its strong, trusting relationships with customers.

3.1.4 Expectations for CIC within Global Cataler

"GLOBAL VISION 2035" presents a balanced approach that aims to secure profits from existing businesses while simultaneously creating new ones. Under the global med- to long-term management plan, each overseas location has been assigned an operating profit target to be achieved by the end of fiscal year 2028. We must strengthen the profit structure. Going forward, the need to supply new products will rise alongside the increase in the domestic production rate, while the tightening of exhaust gas regulations will necessitate the introduction of new production technologies. And CIC has decided to expand its facilities for the first time since the construction of the new building in 2011.

3.1.5 Summary of Business Environment

The above analysis of the business environment revealed the following points.

- Indonesia's economy is expected to experience definite growth in the future, and expansion of the automobile and motorcycle markets is anticipated.
- Although electrification is progressing, demand for HEVs and internal combustion engine vehicles using bioethanol remains high, and demand for exhaust catalysts is expected to remain steady.
- As government policies lead to higher localization rates for automobiles and motorcycles, CIC possesses significant business advantages as one of the few companies able to supply catalysts domestically.
- It is necessary to further expand the business by enhancing communication and increasing satisfaction with customers. For this purpose, improving employee capabilities and implementing measures to prevent employee turnover will become even more important.
- By the expected start of production for new products for key customers in 2028, it is necessary to establish a solid foundation within the company by utilizing TQM to strengthen internal systems and structures.

3.2 Formulation of "CIC VISION 2045" and the Med- to Long-Term Management Plan

Taking these management challenges into account, we have formulated, for the first time since the company's establishment, the "CIC VISION2045" together with a slogan. In order to achieve full participation toward ambitious goals, we realized that Indonesian national characteristics would be more meaningful. Focusing on pride in contributing to national development and the spirit of mutual assistance, we established the CIC VISION, "Grow into a company that contributes to Indonesia's development through Sanpo Yoshi," expressing our intention to support the realization of Indonesia's "VISION 2045". We also included an illustration showing customers, the company, and employees working together to achieve their goals.

For the slogan, we adopted "Gotong Royong," an Indonesian term meaning "mutual assistance" which garnered strong empathy from many employees. Alongside the vision, we also formulated a mid-to long-term management plan, clearly outlining management objectives and strategies for the next 5 years to realize the

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CAC and CIC VISIONs.

3.3 Management Objectives and Strategies

In the CIC Med to Long-Term Management Plan, three quantitative Management Objectives were established for FY2028 and linked to the CIC VISION: core business profit, an average customer satisfaction score, and an employee turnover rate. These objectives represent the value that CIC aims to create for the company, customers, and employees through the concept of Sanpo Yoshi.

3.4 Strengthening TQM Activities to Achieve Management Objectives and Strategies

We believe that the most effective approach is to promote the concept of TQM among employees and integrate it into various systems; accordingly, we have been implementing company-wide TQM activities since fiscal year 2022. Furthermore, we identified 10 challenging activities that contribute particularly to the achievement of our med- to long-term management objectives and strategies. For each activity, we organized the corresponding core TQM concepts and methodolgies and summarized them in a matrix format. In these activities, we apply the basic principles of TQM: “customer first,” “continuous improvement,” and “total participation. Furthermore, by intentionally utilizing TQM tools and implementation methods that are highly effective for each activity, we are efficiently advancing our efforts to achieve management goals through the full application of TQM (Table 3.1). The following chapter describes the ten priority activities through which CIC has translated this TQM journey into concrete changes in its management systems, workplace practices, and organizational capabilities.

Table 3.1 Matrix for Management Objectives related to Management Strategies & Challenging Activities to be strengthened.

● : Especially Effective ○ : Effective

Management Objectives	Strategy	No.	Challenging Activities	Basic Concept			Methodologies								
				Customer First	Continuous Improvement	Employee Participant	Hoshin Management	Daily Management	Quality Assurance	Problem Solving	Marketing	Utilization of IT	Utilization of QC Tools	HR Management	CSR
Core Business Profit	Strengthening the profit structure	1	Hoshin Management Innovation	●		●	●			○	○			○	
		2	Cost Management Improvement		●	●	●					○			
		3	Mechanism of Daily Management		●	○		●	●	○		○	○	○	
Customer Satisfaction	Accurate and quick response to customer needs	4	Customer-oriented sales activities	●	●		○				●				○
		5	Increasing the Quality Assurance Level (CIC version of C-TOP)	●	○		○	●	●	●					○
		6	Strengthen recurrence prevention through C-QIC	●	○			●	○	●			●		○
Employee Satisfaction	Creating a workplace where employees can work with enthusiasm	7	Development of Local Human Resources for Autonomy(C-HAM)			●	○		○	●			○	●	
		8	Information collection, Analysis ,Knowledge Accumulation and Utilization(DX)		●			○	○		○	●	●		
		9	Small group activities with an emphasis on teamwork(QCC)	●	○	●		○	●	●			●	●	
		10	Corporate Social Responsibility(CSR)	●	○		○							○	●

3.5 Introduction and Promotion of TQM

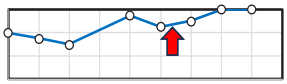
Figure 3.1 summarizes the progress and effectiveness of TQM activities. In CIC, TQM activities have been promoted in three phases. From FY2011 to FY2021, considering the founding period of TQM, we focused on mastering and thoroughly implementing the QMS system based on ISO/IATF standards. Additionally, from the company’s establishment, we started QC circle activities and Kaizen initiatives involving all employees. In FY2017, as TQM activities at CAC were expanded to overseas bases, various systems were introduced, marking a major turning point. Since FY2022, we have begun full-scale introduction of TQM philosophy, further promoting understanding within the company and strengthening TQM activities by adding CIC’s unique features.

Through these efforts, the logical thinking approach of TQM has gradually permeated among employees, fostering a culture where team members think and act independently, resulting in significant achievements.

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TQM Promotion Background

Fiscal Year		2011 ～ 2019	2020	2021	2022	2023	2024	2025	2026
CAC	Headquarters Initiatives	▼QS9000/ISO9001 (1997) ▼ISO/TS16949 Certification (2005) ▼Deming Prize Grand Award (2018)							
CIC	CIC Initiatives	▼Company Establishment (2011) ▼Production Start (2W: 2013, 4W: 2015) ▼ISO/TS16949 Certification (2015) ▼Policy Management System Implementation (2016)			▼TQM Implementation		▽TQM Diagnosis ▼TQM Diagnosis Report		▽Deming Prize Challenge
	TQM Phase	Quality management phase			TQM introduction phase		TQM Development Phase		
	Objectives	Management system implementation and practice			Horizontal development of TQM activities at CAC		Promote TQM activities, including CIC's own activities		
	Policy Management	・Aligned with CAC policy ・Annual company policy ・Management Review to CAC (twice/year)	・CIC Mid-to-long-term management plans				・Identify weaknesses throught TQM diagnosisi		
	Daily Management	・Establishment of division of duties ・Work Instructions activity ・Strengthening work standardization by introducing C-QIC (2017-)			・Periodic review of work standards manuals		・Reviewing all section's responsibilities ・Reviewing daily management items and metrics		
	QC Circle Activities	・Initiated QC Circle activities (2013) ・QC Circle Conference (once/year)	・Strengthening QC Circle activities ・Promoting QC Story dissemination ・Enhancing QC Secretariat skills					Initiated guidance sessions involving management	
	Human Resource Development	・Implementation of OJT focused on related product process work ・Initiation of QC education and problem-solving training	・C-HAM introduced (2017-)		・Initiated SQC training	・M/AM-level training	・Started Safety Dojo	・Promoted multi-skilling company-wide ・Implemented SV-level training	
	Key Effects	・Stable production of 2W catalysts and metal substrates ・Customer Quality award for 2W catalysts (2015) ・Achieved zero defects for one month with 4W catalysts (2015)	・Increased number of months with zero Scrap (see chart below) ・Consistently receiving high ratings in quality and delivery evaluations from customers ・Maintaining zero workplace accidents for 10 consecutive years since June 2015			・Achieved zero defects for 12 months ・Won the Global QCC Competition!		・Keeping high achievement rates for annual policy Key Goal Indicators (KGIs)	







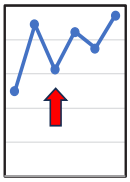


Figure 3.1 Progress and main effectiveness of TQM activities

4. Implementation status of TQM

4.1 Hoshin Management Innovation

4.1.1 Overview

CIC lacked a clear, unique long-term vision; instead, it simply adopted the Hoshins and goals formulated by CAC as internal targets, with Japanese management primarily leading the effort to manage and achieve these goals. As a result, there was considerable fluctuation in the annual achievement rates of the KGIs (Key Goal Indicators). However, we concluded that to achieve sustainable corporate growth, it is essential to share the management team's vision and direction with all employees and to establish a system in which each Section can operate proactively and soundly toward common goals. Consequently, we determined that this would lead to steady improvement in annual KGIs and fundamentally overhauled the Hoshin management system.

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4.1.2 Focus of Activities

Problems prior to TQM introduction

1. The system and standardization of Hoshin Management were insufficient.
2. Top management's vision and directions were not effectively shared with employees.
3. Deployment, understanding, and penetration of Hoshins among frontlines employees were inadequate.

Major Activities

1. Improvement of Hoshin framework and Hoshin management operational methods.
2. Standardization of Section Hoshin management.
3. Establishment of a symbolic and unique Vision and sharing of the top management's direction.
4. Creation of a system for the participation of all employees through bidirectional communication that is attentive to employees.

4.1.3 Contents of Activities

(1) Improvement of Hoshin framework and Hoshin management operational methods

Based on the global Hoshin management framework shown in Figure 4.1-1, we have clarified the relationship and positioning with the CAC Hoshins and rebuilt our Hoshin framework from CIC's management philosophy down to Section Hoshins and personal goals as shown in Figure 4.1-2.

To operate this new Hoshin management framework effectively and to ensure that all employees have a sense of ownership and engagement, we have added several new initiatives. Characteristic activities at CIC include: Ⓐdirect communication from top management to key persons, coupled with a Hoshin alignment process (SURIAWASE process); Ⓑ standardize section Hoshin management to eliminate inconsistencies across Section Hoshins; and Ⓒ "Mendomi Yorisoi" activities, wherein managements communicate Hoshins and expectations to their team members, identify issues they are facing, and work to resolve these issues company-wide to foster greater employee motivation.

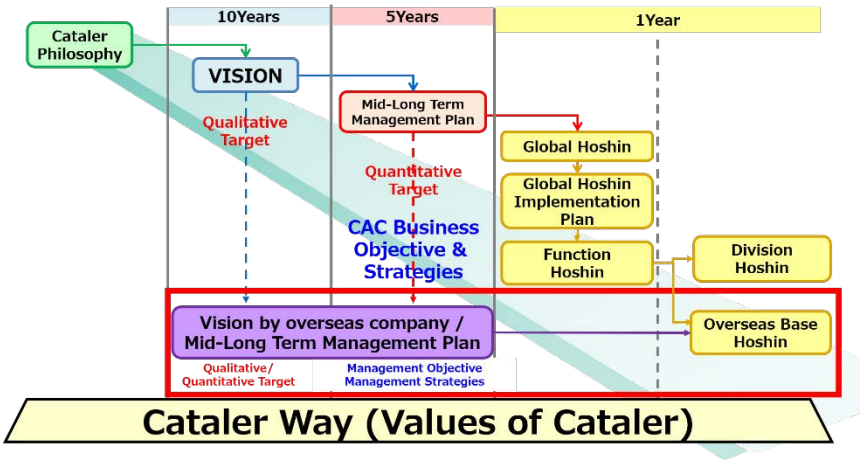


Figure 4.1-1 Global Hoshin Management Framework

(2) Standardization of Section Hoshin management

Section Hoshin formats were inconsistent, and hoshin/daily management items and KGIs/KPIs were often confused, resulting in frequent unachieved KGIs. We standardized the Section Hoshin formats, clarified daily management items and KPIs, and established a review system in Monthly Management meetings to ensure stable hoshin deployment.

(3) Establishment of a symbolic/unique Vision and sharing of the top management's direction

Company Hoshins and management intentions were not sufficiently communicated to employees, resulting in limited employee engagement. To address this, we established the CIC Vision and Slogan, introduced a system for direct communication from top management to all employees, and promoted Vision sharing through company-wide events.

(4) System for the participation of all employees through bidirectional communication

Personal goals were not clearly linked to Section Hoshin, and management–employee communication was largely one-directional. We established SURIAWASE for top-down alignment and introduced the Mendomi Yorisoi Interview for bottom-up feedback, creating a bidirectional communication cycle that strengthens all-employee participation and organizational alignment.

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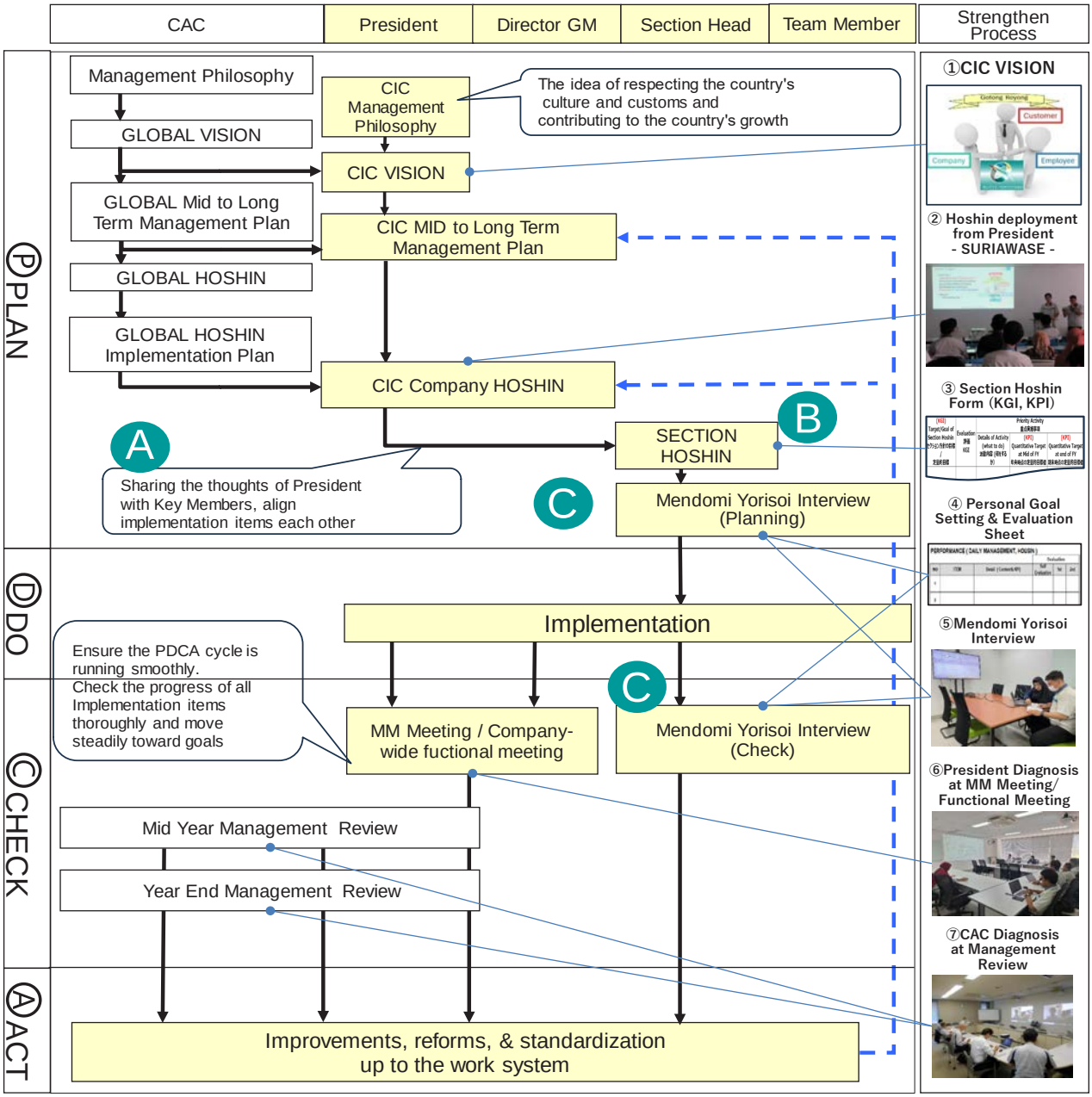


Figure 4.1-2 CIC Hoshin Management Framework

4.1.4 Effects of Activities

(1) Tangible Effect

Through Hoshin Management Innovation activities, CIC Company Hoshins and top management directions have been effectively shared with employees, creating a system where everyone can work toward the same direction. As a result, the company has maintained a high rate of KGI achievement. Furthermore, since the

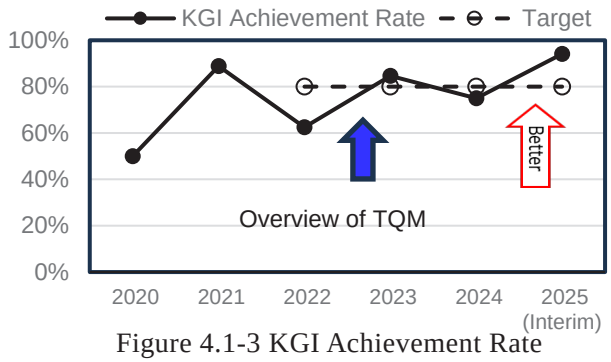


Figure 4.1-3 KGI Achievement Rate

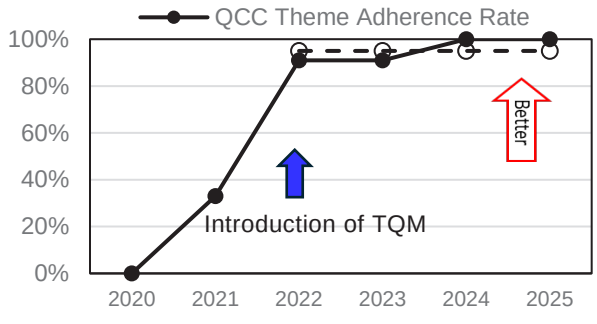


Figure 4.1-4 Alignment Rate between QCC Themes

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introduction of TQM, the alignment between the annual activity themes of the QC Circles and the company/Section Hoshins. This has enabled all employees to contribute to the achievement of company Hoshins through their 100% participation.

(2) Intangible Effect

The management structure has transformed from a traditional top-down, goal-oriented approach to a Hoshin management structure that encourages employee participation. A sense of ownership has begun to emerge among everyone, from section heads to frontline employees, and a purpose-driven mindset is taking root. As a result, a culture in which employees think for themselves, make suggestions, and take action is gradually being fostered.

4.1.5 Future Plan

The CIC Vision and slogan, which are the foundation of this reform, will be penetrated through various events and comments from top management. Additionally, communication with section heads (SURIAWASE) and biannual Mendomi Yorisoi interviews with frontline employees continue to persistently ensuring thorough Hoshin implementation and support employee growth.

4.2 Cost Management improvement

4.2.1 Overview

Due to inflation and rising fixed costs, the company is facing the challenge of declining profits from FY2019 -FY2021, and this trend is projected to continue through FY2024 (FY2022 Mid-Term Plan).

From the above issue, CIC is expected to maintain profit trend while ensuring the stability of company profits by curbing the rise in fixed costs and stabilizing profits through “strengthening the profit structure.”

4.2.2 Focus of Activities

Strengthening profit management can be achieved by implementing the following activities to reinforce CIC’s profit structure.

Problems prior to TQM introduction

1. Declining core operating profit by years.
2. Fixed cost trend to increases by years.

Major Activities

Creating ideas and activities to improve efficiency and achieve our goals, are:
1) Increasing profit with Profit Improvement Activity.
2) Controlling cost and prevent cost increased by Improving Financial Control.

4.2.3 Content of Activities

As explained in the background, it is necessary to strengthen the CIC profit structure to curb the increase in fixed costs and ensure operating profit.

(1) Profit Improvement Activity

Profit improvement activities began in FY2020. CIC has achieved 100% of its targets. However, not all Sections have met their targets. The implementation begins with setting site targets for CIC, after which the goals are allocated to each Section according to their capabilities based on these figures. Since 2022, all Section goals have been reviewed monthly through regular meetings to ensure achievement. Through these meetings,

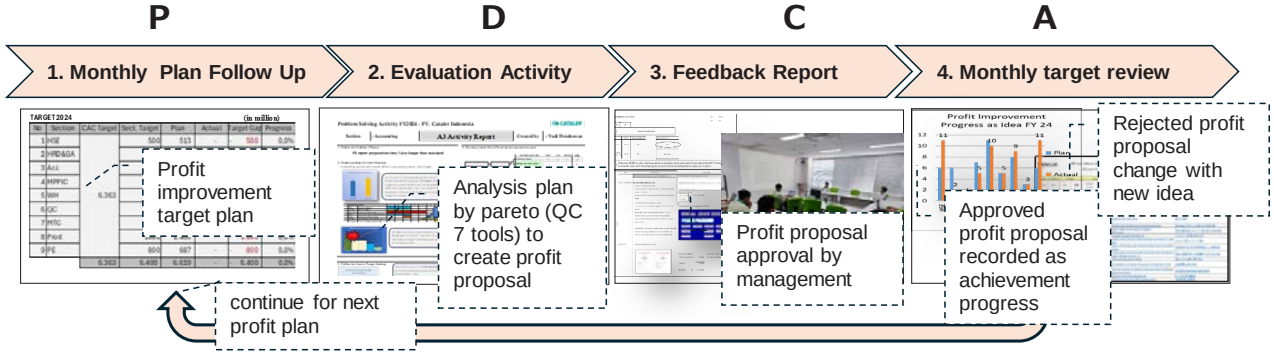


Figure 4.2-1 Profit improvement activity PDCA steps

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the aim is to achieve the profit improvement targets by the end of the current fiscal year.
PDCA cycle consists of Monthly Plan Follow up(P), evaluation(D), Feedback report (C) and Monthly target review (A). If some Section unachieved target, the organizers support participants whose targets have not been achieved to find their ideas in the Yokoten list from Cataler Japan or suggest collaboration with other Sections in accordance with “gotong royong” spirit.

Results of Activity

The results of CIC's profit Improvement activity increased in FY2025 still reached the target and CIC's collective achievement of the participants who achieved their targets also increased by years and 100% participants achieved their own target in FY2025.

(2) Implementation of Improving Financial Control

As mentioned, before we had declining core profit issue and we have plans to stabilize our core profit means we should maintain our profit goal by controlling our cost prevention overbudget plan through an activity named Improving Financial control activity. The purpose of implementing financial control activities is to monitor budgeted spending. Furthermore, this activity also aims to check whether any implemented activities or improvements can reduce fixed costs.

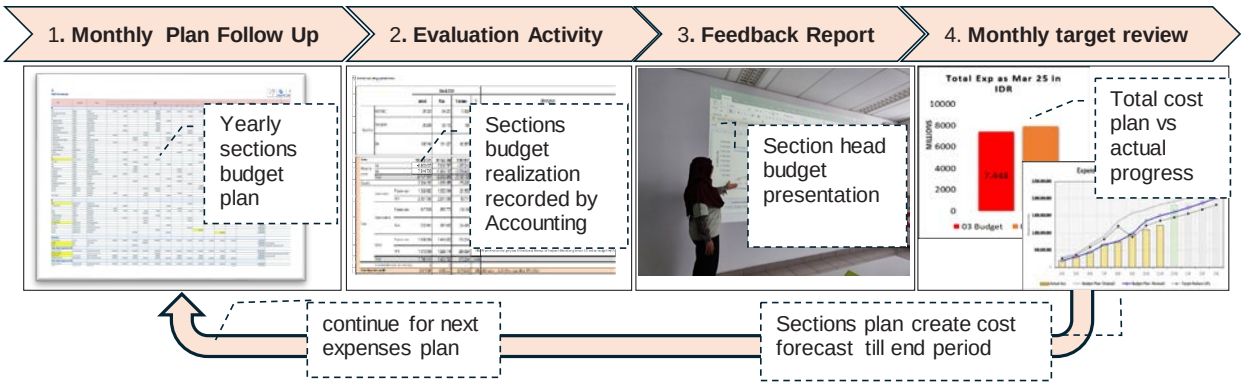


Figure 4.2-2 Financial control activity PDCA steps

PDCA cycle consists of Monthly Plan Follow up(P), evaluation(D), Feedback report (C) and Monthly target review (A). The activities of all sections are accumulated and the causes of deviations in budget realization and reported in semester progress. Sections that exceed their budgets strive to reduce costs or shift less urgent expenses so that actual expenditure remains below target. This activity benefits us because awareness of cost control in each section has increased, and all sections now exercise cost control independently.

4.2.4 Effects of Activities

(1) Tangible Effects

Actual result of Profit Improvement achieved the target every year.

With the economic recovery and the implementation of IFC activity, our cost became easier to manage starting in FY2023, and actual costs fell below the plan.

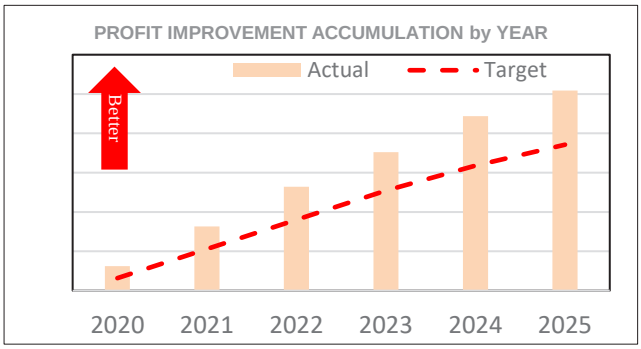


Figure 4.2-3 Profit improvement achievement by year

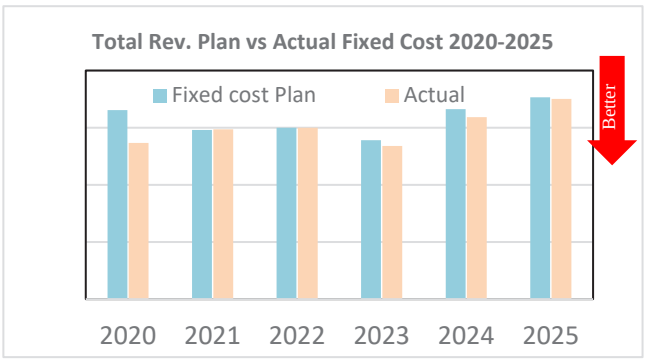


Figure 4.2-4 Total fixed cost actual lower than plan

(2) Intangible Effects

Cost management capability has increased across all Sections, highlighting the need for strong cooperation

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among all Sections to achieve the company's goals.

4.2.5 Future Plan

Fluctuations in exchange rates and PGM prices have a significant impact on profits, and we are working to mitigate this.

4.3 Mechanism of Daily Management

4.3.1 Overview

Various problems continue to arise frequently, particularly in production operations, and corrective actions are sometimes delayed. One of the root problems is that the implementation of daily management which still depends on individuals, so it is not completely system based. As a result, problem escalation and decision-making often lack consistency and are not systematized. Problem management tends to focus on short-term responses and does not fully lead to permanent solutions based on systematic root cause analysis. Since the data collection and analysis processes remain largely manual, the necessary information is not obtained in real time or with sufficient accuracy when abnormalities occur.

4.3.2 Focus of Activities

Problems prior to TQM introduction

1. The Daily Management System has not been effective
2. The response to abnormalities is still slow and the improvement is still temporary solving methodology.

Major Activities

1. Strengthening Daily Management through the Operational Procedure (OP) Mechanisms
2. Digitization of Daily Management

4.3.3 Contents of Activities

(1) Strengthening Daily Management Activities

Daily management manages and visualizes abnormalities and changes that occur during shifts, by sharing information between leaders and PICs to ensure that handling is not only emergency but leads to appropriate corrections and prevention of recurrence. Monthly management monitors performance numerically through key indicators such as defect ratio, productivity, and loss, as well as developing issues that are not resolved daily into a theme of priority improvement or hoshin management that is in line with management targets. Through the systematic management of the daily management of the Operation Procedure (OP) in each period, the speed of response to abnormalities, the reliability of corrective actions, and continuous improvement can

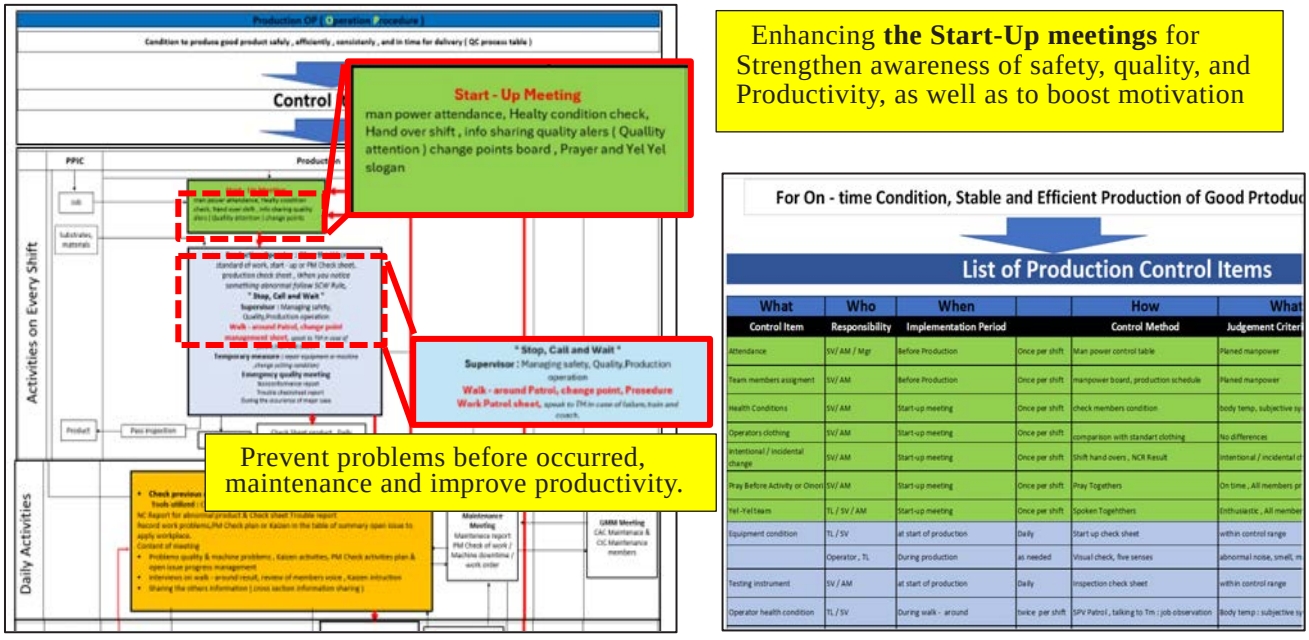


Figure 4.3-1 Operation Procedure (OP) & Control items List

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be strengthened.

Shift Management: Startup Meeting (Daily Management Routine)

During Startup Meetings, the following items are addressed: sharing of quality alerts and quality advisories—including information on quality alerts, potential defect risks (NG), and precautions to ensure quality control in the process, Flash report information from global site (Global F/R) ,review of changes in 4M factors ,Safety & Quality Awareness Reinforcement through strengthening commitment to safety, quality, and productivity through joint prayer and the delivery of slogans/yells as a form of improving morale and team engagement.

(2) Digitization of Daily Management

Through real-time visualization of production parameters and conditions and automation of data collection and processing that have improved the accuracy of abnormalities detection, shortened response times, and significantly reduced the burden of management tasks.

Changes Before and After DX Implementation (Before / After)

Before

Abnormalities detection relied on the five senses of operators and patrol supervisors, and since the management of production, quality, and anomaly data was done manually, collecting and reporting this information took a tremendous amount of time. Additionally, record-keeping was inadequate and frequently required corrections, making it difficult for managers to analyze the data. Furthermore, daily production results, which were handwritten on management boards, were presented in summary form, limiting the time available for on-site analysis and continuous improvement (KAIZEN).

After

After implementing digital transformation (DX) using the Vispro Visualization Board: A management tool was introduced that displays important parameters and production conditions in real time, enabling operators, leaders, and person in charge (PICs) to immediately recognize abnormalities and changes through clear visual displays (Fig. 4.3-2). Furthermore, by centralizing and implementing automation for production, abnormalitiy, and management data, the burden of managerial workload was significantly reduced, enabling rapid, fact-based decision-making and allowing the team to focus more on corrective actions (Figure 4.3-3).

Through this transformation, daily management has evolved from an inspection-centric approach to a system that prioritizes early prevention of abnormalities, rapid response, and reliable corrective actions. Digitalization and automation have improved the accuracy and speed of decision-making while reducing the administrative burden, allowing leaders and managers to focus more on root cause analysis and recurrence prevention. The systematic integration of daily management and digital transformation (DX) has significantly strengthened production stability and the sustainability of the PDCA cycle.

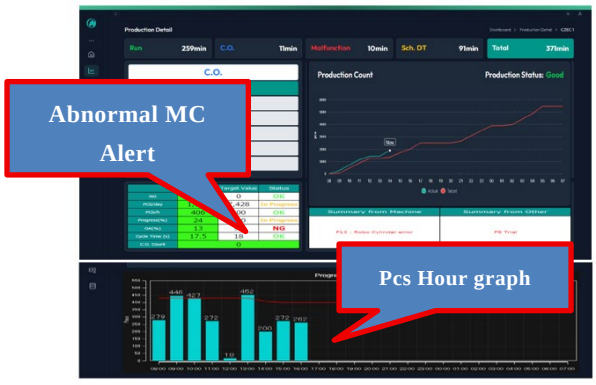


Figure 4.3-2 Vispro visualization Board control

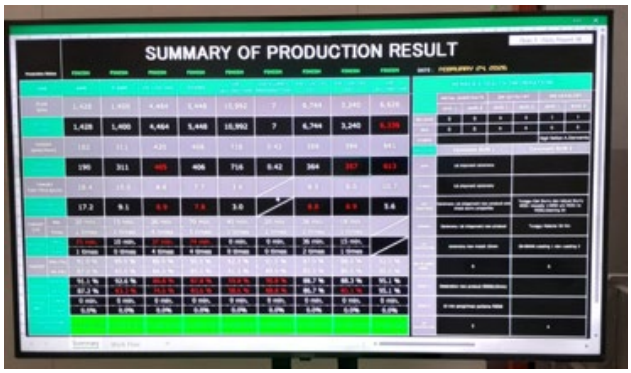


Figure 4.3-3 Production Result Board

4.3.4 Effect of Activities

(1) Tangible Effects

The number of Large scrap incidents has decreased, and we have achieved zero incidents since FY 2023. Furthermore, operational efficiency has improved through strengthened daily management, and the concrete results of these efforts have had a positive impact on employee motivation.

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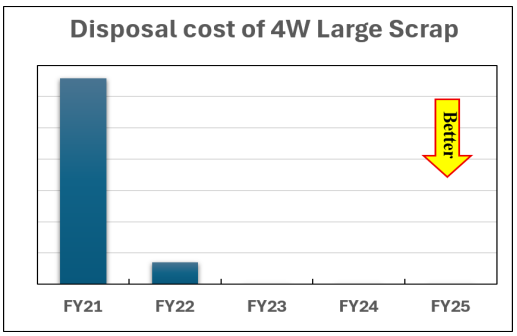


Figure 4.3-4 Trends in Large-Scale Scrap Costs (4W) Activities

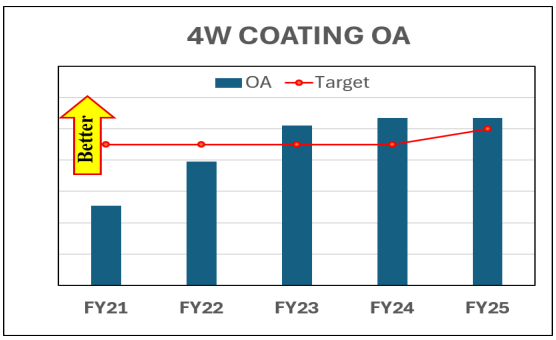


Figure 4.3-5 Trends in OA Performance

(2) Intangible Effects

The strengthening of daily management and management digitalization has enhanced individual competencies in analysis and structured problem solving. The availability of real-time data and clear digital visualization enables faster response to abnormalities. This has encouraged data-driven decision making, increased ownership, and fostered a more proactive improvement in culture across the Section.

4.3.5 Future Plans

Building a Production System that is Flow-Based and Ready for Expansion

To support future business expansion and increased production volume, the plant layout will be optimized as part of continuous improvement integrated with the production system. This future layout aims to eliminate transportation and movement waste, reduce waiting times, and secure expansion capabilities. Optimization will be implemented gradually as production volume grows, with management's commitment to ensure stability and improvement of QCDSM performance in the medium to long-term.

4.4 Customer-Oriented Sales Activities

4.4.1 Overview

Customer-oriented sales activities are one of the key function where CIC needs to achieve improvement. In the 2021 customer survey, although the overall score remained within our target range, the downward trend became more pronounced. This was due to the fact that the targets were not met in the “Price” and “Service” categories. Of the five categories(Price, Service, Supply, Technology, Quality) in total, the category “Price” and “Technology” are to be managed by CAC. We worked on improving “Service” category. To improve customer satisfaction scores, CIC must clearly understand the marketing perspective on meticulously managed daily operations and a strong customer-first mindset, and consistently put them into practice in daily activities.

4.4.2 Focus of Activities

Problems prior to TQM Introduction	Major Activities
1. Lack of proactivity in understanding customer needs 2. Lack of direct communication with customers 3. Slow response to customers due to lack of internal coordination	1. Responding to urgent customer needs 2. Increase direct visit customer (face-to-face interactions) 3. Strengthen feedback monitoring and follow up on customer needs

4.4.3 Contents of Activities

Based on the survey results, CIC needs to build a system to maintain speed, consistency, and transparency in responding to customer needs. Without such a system, the potential risks in the future include:

- Loss of customer trust,
- Decreased customer satisfaction and loyalty,
- Potential loss of business opportunities amid global competition.

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This system is expected to serve as a bridge between urgent customer needs and the company's internal capabilities, while also functioning as a tool to ensure that customer satisfaction is measured and continuously followed up in a sustainable way.

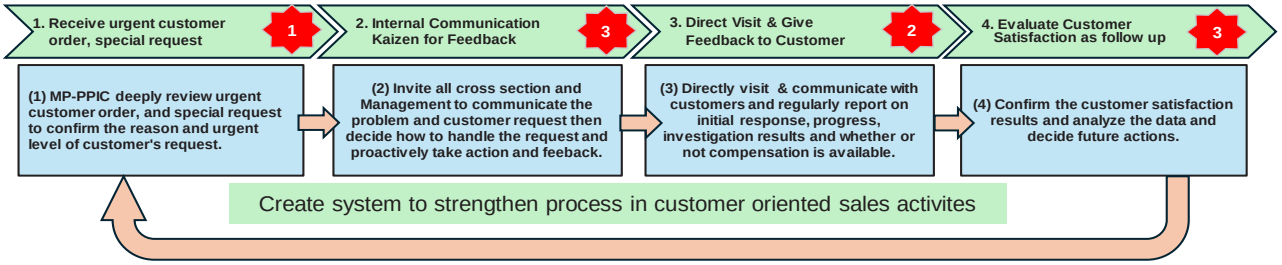


Figure 4.4-1 System to strengthen customer-oriented sales

(1)Responding to urgent customer needs

Customers frequently complained about our handling of sudden changes, such as bringing forward or postponing delivery dates, as well as our response to unplanned additional orders. Consequently, in 2024, we adopted a systematic approach to manage these customer needs. Specifically, as shown in the flowchart in Figure 4.4-2, we established procedures for creating "customer request records" and coordinating with relevant Sections. As a result, the handling of delivery date changes and additional orders, which had been the source of customer dissatisfaction, was improved, leading to a reduction in such complaints.

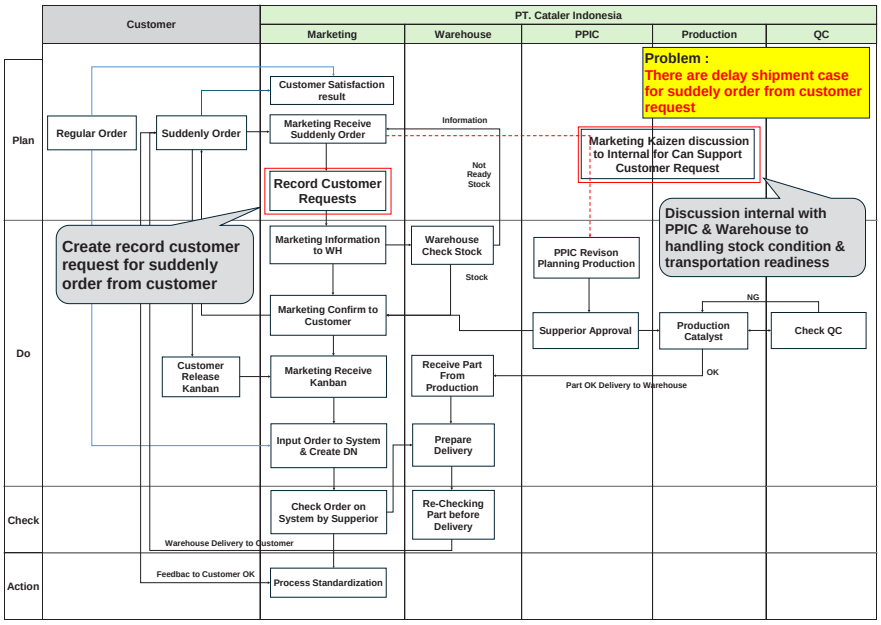


Figure 4.4-2 Responding to urgent customer needs oriented sales

(2) Increase direct visit customers (Face-to-Face Interactions)

The objective of direct visits to customers (face-to-face interactions) is to strengthen relationships with customers and improve service quality. By gaining a deeper understanding of customer needs, we can enhance our responsiveness and build stronger relationships and trust with customers. And we improved the quality of our interactions by establishing a regular visit schedule, providing internal feedback on conversation topics, and creating opportunities for follow-up on matters requiring attention.

This has made it possible to identify potential customer issues early on and take preventive measures.

(3) Strengthen feedback monitoring and follow-up customer needs

We also established a forward-looking, systematic framework for collecting and analyzing customer feedback and conducting follow-ups. This activity goes beyond merely addressing urgent issues; it ensures that all customer requests are continuously monitored, appropriately categorized, and followed up with clear actions. "Customer Request Summary template" allows us to record and track each customer's requests, making it easier for both internal teams and the CAC to monitor responses and the actions taken. This summary promotes transparency and accountability, ensuring that customer feedback is never left unresolved. The objectives are to improve service quality, speed up responses, and strengthen long-term customer trust.

4.4.4 Effects of Activities

(1) Tangible Effects

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Satisfaction scores (Service category and total score) consistently exceeded targets, showing a positive trend through 2023 and remaining above target even in 2024, proving that the foundation of service improvement is strong and sustainable. In 2025, customer satisfaction increased again, in line with the higher targets set by the company. CIC has successfully reversed the previous decline in customer satisfaction and strengthened the belief that a strong commitment to service quality is the key to maintaining long-term relationships with customers.

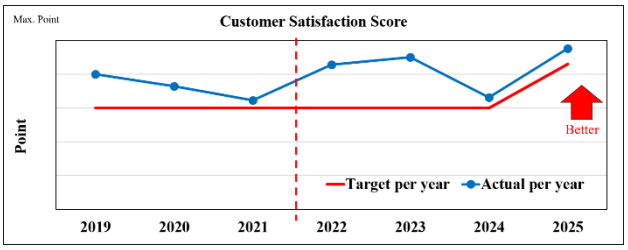


Figure 4.4-3 Customer Satisfaction Score



Figure 4.4-4 Customer Satisfaction - Service

(2) Intangible Effects

Better interactions, faster responses, and consistent follow-ups have made customers feel more confident and closer to CIC. Customers now see the company not only as a product supplier, but also as a caring and responsive partner. Internally, the focus on service excellence has fostered a more proactive and customer-oriented work culture. The team has become more motivated, more adaptable, and more united in delivering solutions. These impacts have built a strong foundation for long-term relationships, increased customer loyalty, and strengthened the company's overall reputation.

4.4.5 Future Plans

After successfully implementing initiatives such as responding to urgent customer needs, increasing direct customer visits, and strengthening feedback monitoring & follow-up, CIC now faces the challenge of moving beyond reactive and structured improvements. The next step is to design a future plan that ensures sustainability, scalability, and innovation in operations.

4.5 Increasing the Quality Assurance Level (CIC Version of C-TOP)

4.5.1 Overview

In 2019, CIC collaborated with the CAC Quality Control Department to introduce the "Quality Assurance System Diagram" C-TOP (Cataler - Total Operation Procedure). The purpose of C-TOP is to establish a system that ensures all project phases strictly adhere to the customer's project schedule, thereby maintaining zero complaints from the market and zero delays in providing support (documentation and product samples) to customers. However, during past launches of new models, areas for improvement were identified regarding the management of document submissions in relation to customer monitoring items. And then, CIC has strengthened the C-TOP system and clarified project workflows and responsibilities to prevent communication misalignments and defects. Additionally, by introducing a LIMS (Laboratory Information Management System), CIC has eliminated human error in testing and ensured the accuracy, transparency, and integrity of quality assessments (prevention of quality fraud).

4.5.2 Focus of Activities

Problems Prior to TQM Introduction

1. Problem occurred due to insufficient control at each stage of new model preparation.
2. A significant portion of quality inspection continues to be performed manually, which consequently requires a considerable amount of time to complete.

Major Activities

1. To provide the best service customers through the reconstruction of Quality Assurance System Chart (C-TOP) to ensure a smooth mass production process.
2. Implementation of a Laboratory Information Management System (LIMS).

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4.5.3 Contents of Activities

(1) To provide the best service through the reconstruction of Quality Assurance System Chart (C-TOP) to ensure a smooth mass production process.

1). Revising the Quality Assurance System Chart (C-TOP) by clarifying critical process

Since the post-implementation quality Assurance System Chart (C-TOP) introduced by CAC did not explain the workflow of each project or the operational responsibilities of each section in detail, there remained a high risk of management deficiencies, communication misalignments, and insufficient information sharing. Therefore, in 2021, the QC section and related sections (PE-IT, MP-PPIC, PRD, WH, MTC, etc.) held discussions regarding the restructuring of the Quality Assurance System Chart. And original new gate meetings were added to prevent delays in the Quality Assurance System Chart (Figure 4.5-1).

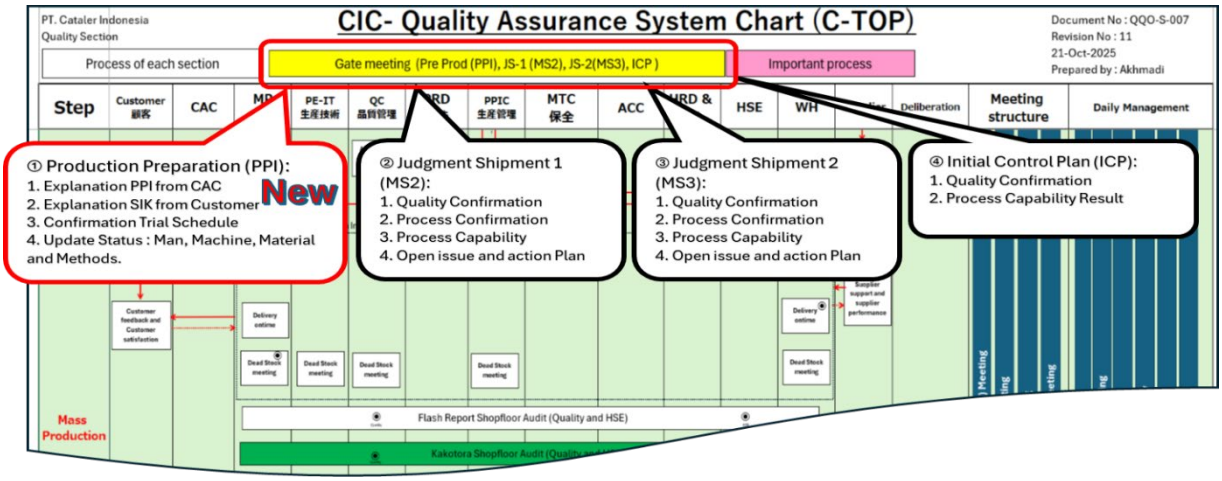


Figure 4.5-1 Quality Assurance System Chart (C-TOP) for Improvement (KAIZEN)

2). Production Preparation (PPI) Meeting

In 2021, “Production Preparation (PPI) Meetings” was added. Its objective is to monitor all project activities (from planning through the delivery schedule to the customer). The PDCA cycle for this activity is shown in Figure 4.5-2. This activity is jointly conducted by cross-functional teams led by PPIC members.

The PPIC Section holds regular meetings with relevant sections and CIC management. In these meetings, each section explains and reports on project progress for each model and customer. For example, the MP Section reports on deadlines for customer activities, the PE Section reports on CIC’s prototyping plans and progress, and the QC Section reports on inspection activity plans. To provide visualization of the latest status of new models, the PPIC Section has created a bulletin board accessible to all employees.

As a result of consistently promoting and implementing these activities, similar issues—such as delays in delivering documents to customers—have not occurred. Furthermore, the PPI meetings have enabled proper management of all activities related to CIC and customers, eliminating communication misalignments and information gaps between sections.

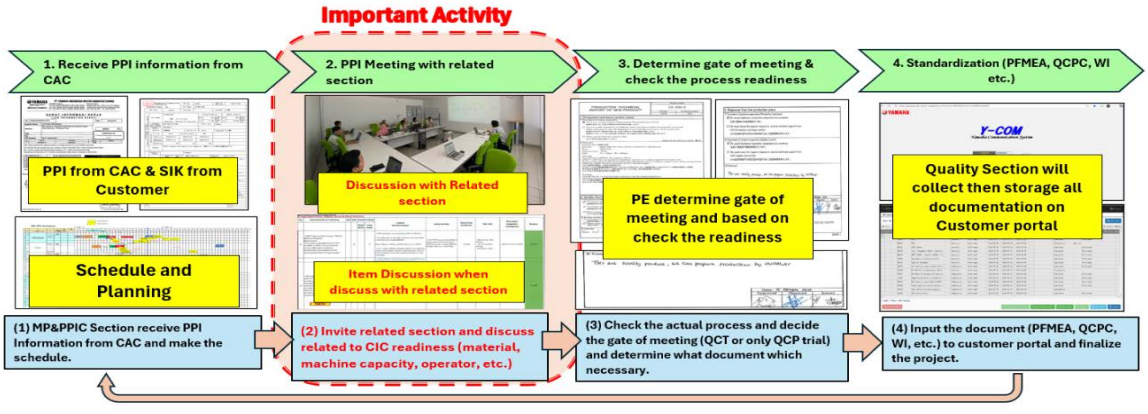


Figure 4.5-2: PDCA Cycle for Production Preparation (PPI) Meeting

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(2) Implementation of the Laboratory Information Management System (LIMS)

The most critical aspect of the inspection process is the accuracy of the calculated inspection results. Many inspection processes still rely on manual calculations. To prevent data entry errors during inspections and avoid incorrect disposition, we began implementing a Laboratory Information Management System (LIMS) in January 2024. The LIMS workflow is shown in Figure 4.5-3.

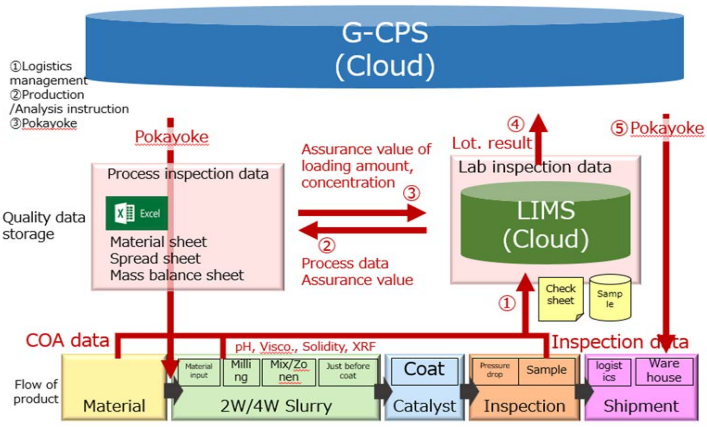


Figure 4.5-3 Overview of the LIMS

The purpose of implementing LIMS is to correct and prevent errors in the calculation of test results, as well as to reduce manual calculations that could lead to human error in the evaluation of test results. As a result of the implementation, manual calculations are no longer required for approximately 21 measuring instruments integrated with LIMS, and all calculations and data entry for test results are now performed automatically.

4.5.4 Effects of the Activities

(1) Tangible Effects

Specifically, between 2023 and 2024, there were absolutely no customer complaints regarding quality issues or delays in project support, such as late submission of documentation or delays in the delivery of sample parts. Furthermore, the effective dissemination of information regarding new products across all departments has been ensured, preventing the occurrence of misinformation (Figure 4.5-4).

Since the introduction of LIMS in 2023, the need for manual calculations and data entry of inspection results has been eliminated, thereby resolving issues related to calculation errors and misjudgments following the inspection process (Figure 4.5-5).

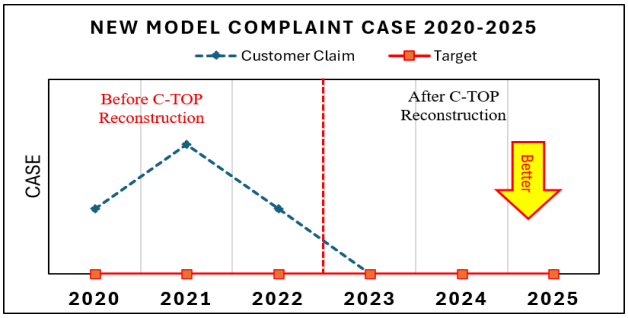


Figure 4.5-4 Customer Complaint

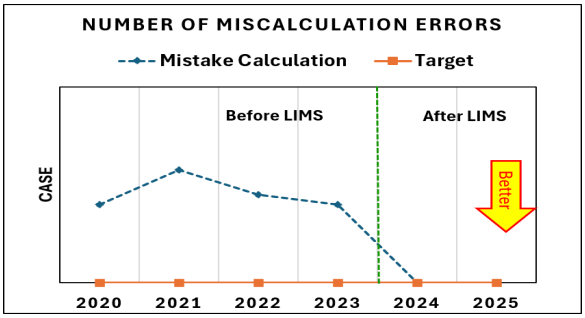


Figure 4.5-5 Trends in the Number of Calculation Errors in the Inspection Process

(2) Intangible Effects

The customer assurance process has been clearly visualized, and CIC is confident in its quality assurance system, which produces high quality on a global scale.

4.5.5 Future Plans

1. CIC will build a process proactively absorb quality information from CAC and create quality with feedback to the development.
2. CIC's C-TOP activities evolve into a robust, audit-ready, and globally competitive quality assurance system, aligning with TQM principles and customer satisfaction goals.

4.6 Strengthening Recurrence Prevention through C-QIC

4.6.1 Overview

C-QIC stands for "Cataler – Quality Innovation Challenge" and constitutes an initiative to improve the quality of work based on the self-solving (JIKOTEI KANKETSU) concept. C-QIC activities started at CIC in 2016,

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with a focus on “creating a standard that does not cause any problems” and “creating a system that does not cause any problems (comprehensive recurrence prevention).” CIC implemented continuous improvement in accordance with the PDCA cycle, resulting in zero market claims and receiving customer awards for quality excellence. However, internal defects still require attention, and problem recurrences continue to occur.

4.6.2 Focus of Activities

Problems prior to TQM introduction

1. Inadequate The ability to analyze the causes and why-why analysis of defects was insufficient.
2. There was insufficient confirmation of the effectiveness of the countermeasures after taking them.
3. The idea of preventative action was weak and it was not possible to predict problems that might occur in the future.

Major Activities

1. Strengthen Root Cause Analysis and Recurrence Prevention Through Enhance R&P Meeting.
2. Verify Long-Term Effectiveness of Countermeasures via systematic Kakotora Shopfloor Audits.
3. Proactively Prevent Imported Problems from the Cataler Group through Flash Report-based Gemba audits.

4.6.3 Contents of Activities

The basic concept of C-QIC is derived from the PDCA and SDCA cycles and aims to continuously improve the quality of work, as illustrated in Figure 4.6-1. The key components of C-QIC are as follows: If there are no existing standards based on Job Description, new standards should first be established and the requirements for each task clarified (Standardize). Tasks are then executed according to these standards, and progress and outcomes are monitored. The standards are reviewed, and in the event of any issues or malfunctions, corrective measures are formulated to prevent recurrence; these measures are incorporated into the standards.

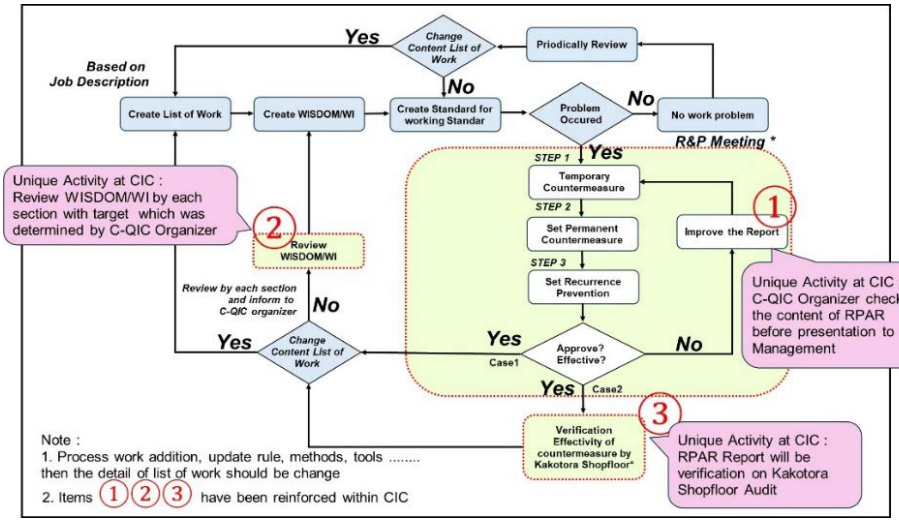


Figure 4.6-1 PDCA Cycle for Preventing

(1) Strengthening Root Cause Analysis and Recurrence Prevention Through Enhanced R&P Meetings

When a problem (about Safety, Environment, Product Quality, Work Quality, BCM) occurs, preventive countermeasures are prepared and implemented after root cause analysis (e.g., 5-Why method). CIC documents these actions in a Recurrence Prevention Action Report (RPAR). To ensure effectiveness, the RPAR is presented at an R&P meeting attended by all departments and management. The Quality section organizes these meetings on a monthly basis. During the meeting, management evaluated the RPAR, root cause analysis, troubleshooting, and problem-solving approach. Once recurrence prevention is confirmed and the RPAR is approved by management, the presenter receives formal recognition. To strengthen and prevent such problems from recurring, the RPAR problem classification was expanded by adding the potential problems (Near Miss) that may occur in any work process.

(2) Verify Long-Term Effectiveness of Countermeasures via systematic Kakotora Shopfloor Audits

Without systematic verification of corrective actions taken in the past, their effects will not be sustained, and there is a risk of recurrence. Therefore, starting in 2022, CIC introduced a unique initiative called the “Kakotora Shopfloor Audit” to verify the long-term effectiveness of past corrective actions and recurrence prevention measures. Kakotora audit activities are conducted monthly according to an annual plan, and each past countermeasure is selected for verification within a three-year cycle. These audits involve cross-functional

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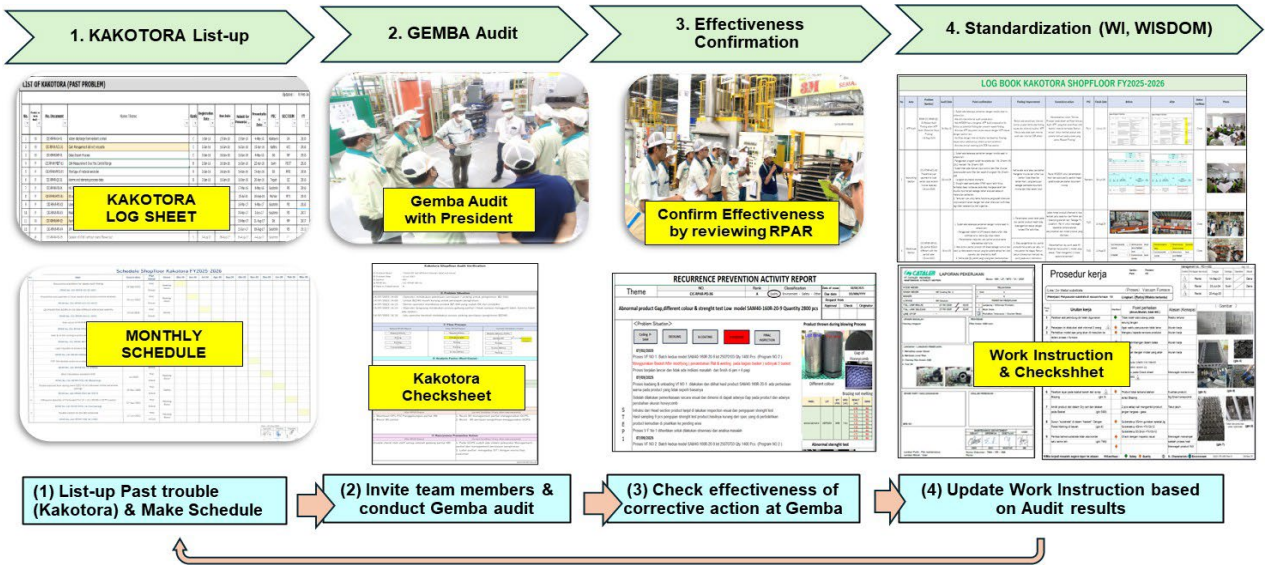


Figure 4.6-2 PDCA Cycle for Kakotora shopfloor Audit

team members and management, who conduct on-site inspections (genba walks) to confirm that corrective actions are consistently maintained, that work instructions are posted at the worksite, and that workers are properly adhering to them. Additionally, team members provide feedback and ideas for further improvement (KAIZEN).

(3) Proactively Prevent Imported Problems from the Cataler Group through Flash Report -based Gemba audits

Since 2016, when a problem (about Safety, Environment, Product Quality, Work Quality, BCM) occurs in Cataler Group company, based on the categories defined in the “Defect Ranking Table,” CIC has been receiving as flash reports issued by that company and verifying whether the same issues could occur at CIC’s sites. As part of Kaizen, starting in 2020, the approach was changed to one that involves immediate on-site verification (Gemba Check/Shopfloor Audit).

Upon receipt of a Flash Report from the Cataler Group, QC screens the issue and conducts a Gemba Check when it is related to a CIC process or assessed as Rank S. For high-risk issues with strong process similarity, a cross-functional audit involving relevant sections and management is conducted to verify actual conditions, evaluate root causes, and confirm the effectiveness of proposed countermeasures.

The standardized process is as follows: QC screens all Flash Reports from the Cataler Group and conducts further analysis for CIC-related or Rank S issues. For high-risk issues with strong process similarity, a cross-

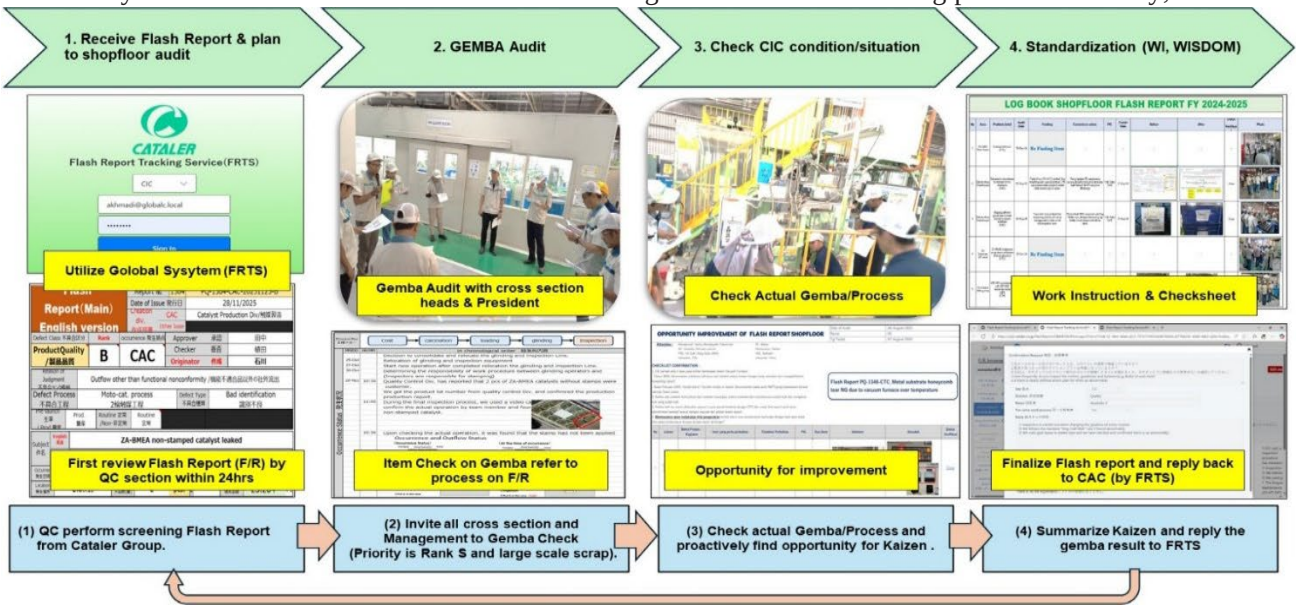


Figure 4.6-3 PDCA cycle for Flash Report Gemba Check

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functional audit involving relevant sections and management is performed to verify actual conditions, evaluate root causes, and confirm the effectiveness of countermeasures.

This standardized activity has proven highly effective. Since its implementation, CIC has successfully prevented the recurrence of similar problems that occurred in other Cataler Group affiliates, particularly for large-scale issues.

4.6.4 Effects of Activities

(1) Tangible Effects

By consistently promoting the creation of WI/WISDOM every year, the total number of work instruction documents, including those from staff departments, has reached 1,460, achieving a 100% coverage rate of all business operations (Figure 4.6-4). Regarding recurrence prevention, by steadfastly implementing the above initiatives, we have been able to keep the number of recurring defects at zero, as shown in Figure 4.6-5.

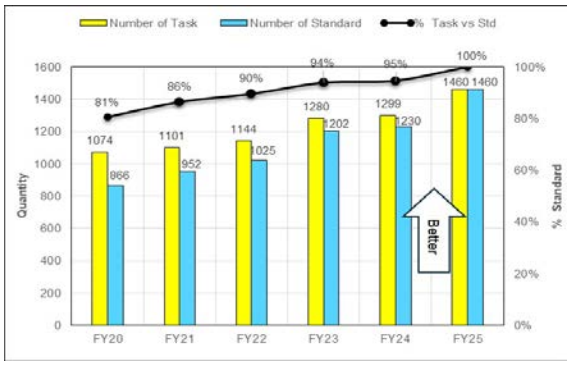


Figure 4.6-4 Number of Tasks vs. Standard Quantity

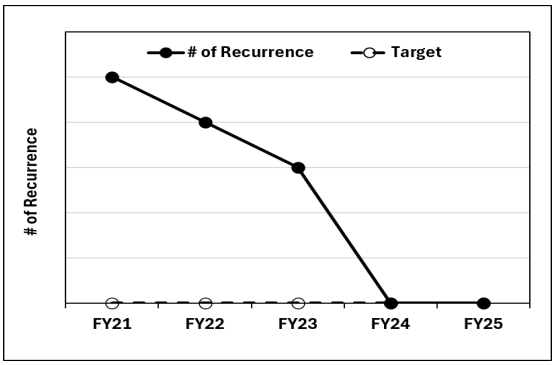


Figure 4.6-5 Number of Recurring Defects

(2) Intangible Effects

Through their daily work, CIC employees have come to recognize their own roles and have become more agile in responding to challenges.

4.6.5 Future Plans

Going forward, we will continue to implement and standardize the C-QIC, Kakotora on-site audit, and Flash Report on-site audit processes across all departments, striving to make these integral elements of CIC's culture. We will also develop in-house training modules on root cause analysis and recurrence prevention, while strengthening cross-departmental collaboration.

4.7 Developing of Local Human Resources for Autonomy (C-HAM)

4.7.1 Overview

CIC operates with small teams in each section, making it critical continuously strengthen the organizational capabilities required to deliver customer value and support sustainable growth as a key production base within the Cataler Group. Prior to the introduction of TQM, the existing systems were not effectively operated, making it difficult for the organization to clearly and comprehensively define the work required to fulfil its functions. As a result, changes in the business environment, regulatory updates, and new business initiatives were not adequately reflected in the training programs to ensure the required skills were developed. In addition, low participation in training further indicated insufficient capability development.

4.7.2 Focus of Activities

Problems prior to TQM Introduction

1. Required capabilities were not align with environmental changes, organizational goals and job requirements
2. Insufficient development of fundamental competencies due to low participation in training programs
3. Lack of skills to support job requirements

Major Activities

1. Establishing the CIC training framework (C-HAM)
2. Develop General Training programs aligned with environmental changes
3. Enhance Special Training programs to strengthen individual employee aligned with business changes

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4.7.3 Contents of Activities

(1) Establishing the CIC Training Framework (C-HAM)

To create value that exceeds customer expectations, companies must continuously enhance their organizational capabilities, which depend heavily on employees' knowledge and skills.

Based on the concept of positioning employees as "valuable assets," C-HAM (Cataler Human Asset Management) or CIC's training framework was established (Figure 4.7-1) as a Human Resource Development system that enables employees to systematically, efficiently, and effectively acquire the competencies required to strengthen organizational capability, achieve personal targets, and deliver value to customers.

The C-HAM training system consists of General Training, which provides the fundamental knowledge required to work at CIC, and Special Training, which is designed to enable each organization to effectively carry out its specific roles and responsibilities.

Through General Training, employees develop problem-solving skills, management capabilities, and knowledge related to TQM. In Special Training, they enhance their practical skills by utilizing procedure manuals (WISDOM, WI) that support each organization's core operations.

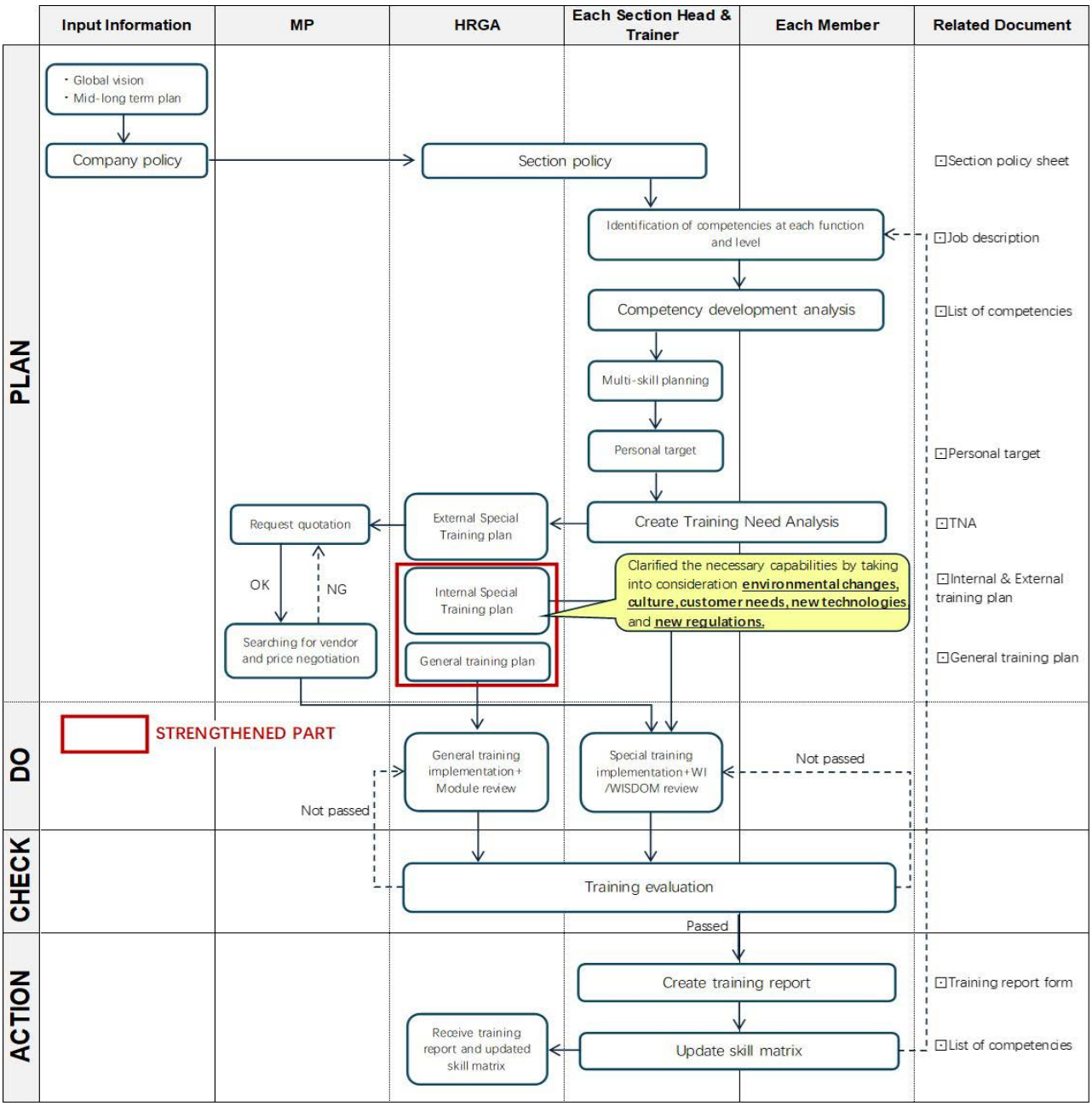


Figure 4.7-1 Training Flowchart

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(2) Develop General Training Programs aligned with environmental changes

When general education was first introduced, CAC offered only 18 programs, which focused primarily on basic training in quality and safety for new CIC employees.

As the business environment became more dynamic, CIC gradually expanded the scope of general education to meet new needs. Additional programs—including safe driving, anti-phishing measures, 5-why analysis, cost management, and employee income tax filing—were incorporated into the C-HAM framework to enhance employee competencies and risk awareness. Currently, CIC offers a total of 35 general education programs.

At CIC, we are also focusing on developing in-house trainers to ensure the effective implementation of general training programs. Selected candidates receive systematic training and guidance from headquarters. After undergoing a series of evaluations—including assessments of their mastery of the material and their instructional skills—they become officially certified trainers by the headquarters training team. As a result, the number of in-house trainers has been increasing year by year.

(3) Enhance Special Training Programs to strengthen individual employees

Following the introduction of TQM, the management system for special training was significantly strengthened. As explained in 4.6C-QIC, the CIC creates a “List of Duties” based on job descriptions. Each department creates a “List of Competency Requirements and Special Training Plan” (Figure 4.7-2) based on the task list, target skill levels are defined, and any gaps are incorporated into the annual training plan.

Training is conducted by members assessed as Level 4 (qualified as trainers) using established WISDOM/WI training materials. At the same time, WISDOM/WI documents are reviewed and updated as necessary to reflect changes and improvements in business processes.

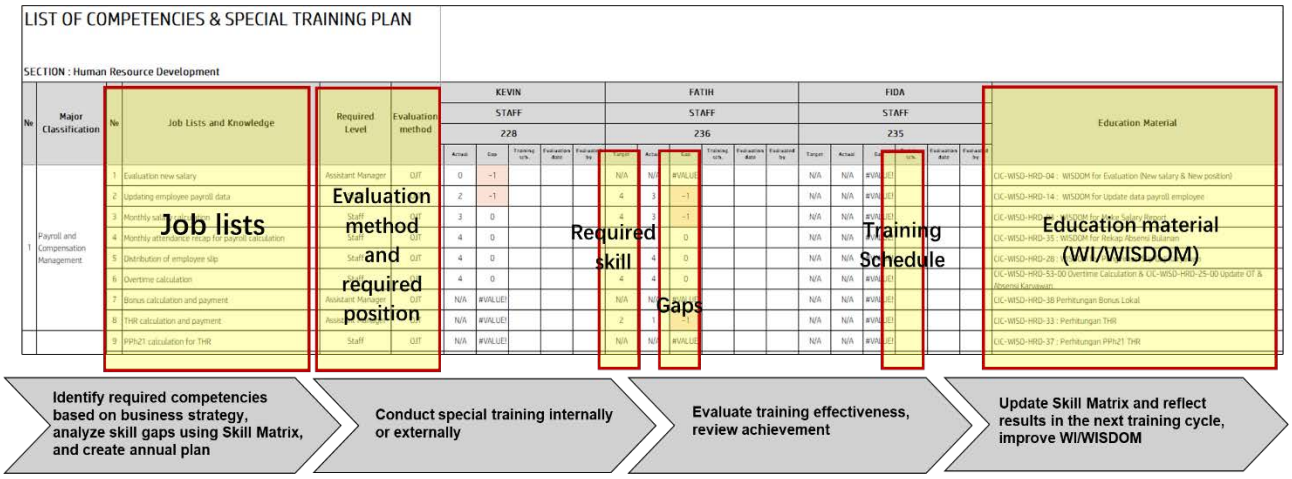


Figure 4.7-2 List of Competencies and Special Training Plan Sheet

4.7.4 Effects of Activities

(1) Tangible Effects

Through the strengthening of the training framework, by 2025 it will be possible to systematically identify and standardize all operational tasks necessary for the organization to perform its functions. This is reflected

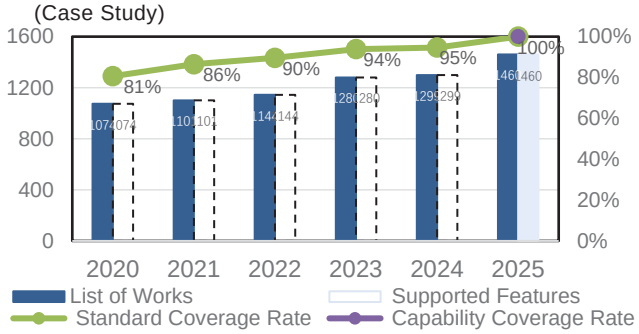


Figure 4.7-3 Capacity to Perform Organizational Operations

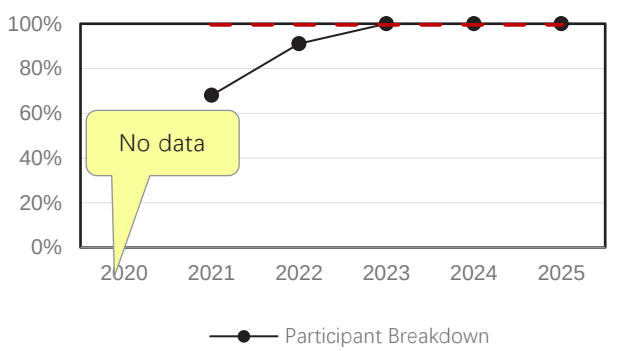


Figure 4.7-4 Participation Rate in General Training

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in the “List of Operational Tasks,” and the number of items on this list has been increasing significantly year by year. This demonstrates that the organization is effectively identifying additional tasks arising from environmental changes, incorporating them into the “List of Tasks,” standardizing them, and addressing them appropriately through capacity building utilizing the C-HAM training mechanism (Figure 4.7-3). Furthermore, employee participation in assigned training programs has reached 100% (Figure 4.7-4).

(2) Intangible Effects

Strengthening the training management system has boosted employee confidence, enabling more accurate decision-making and effective responses to challenges. Furthermore, because employees feel that their contributions are recognized and valued, a proactive approach to problem-solving has been fostered, and motivation and engagement have also improved.

4.7.5 Future Plans

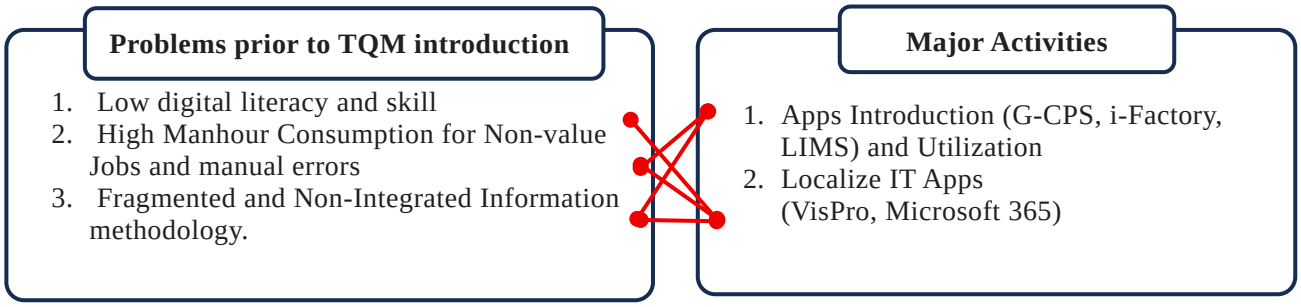
Going forward, the company will align its bonus and promotion systems with job qualification standards to establish a fair and transparent human resource development framework that supports employee growth. Furthermore, since general training does not yet fully cover all job grades, the company will continue to expand and strengthen these programs.

4.8 Information Collection, Analysis and Knowledge Accumulation and Utilization

4.8.1 Overview

We recognized that our company often relied on manual data entry, paper-based records, and siloed, fragmented data, and that traditional methods of information collection and analysis were no longer sufficient to support rapid decision-making and continuous improvement. Consequently, we launched a company-wide digital transformation (DX) initiative focused on improving how we collect, analyze, and utilize information. Our goal is to reduce the man-hours spent on difficult and repetitive tasks, improve the traceability of operations, reliably capture valuable knowledge, and foster data-driven thinking.

4.8.2 Focus of Activities



4.8.3 Contents of Activities

The progress of digital transformation at CIC since the introduction of TQM is summarized in Figure 4.8-1.

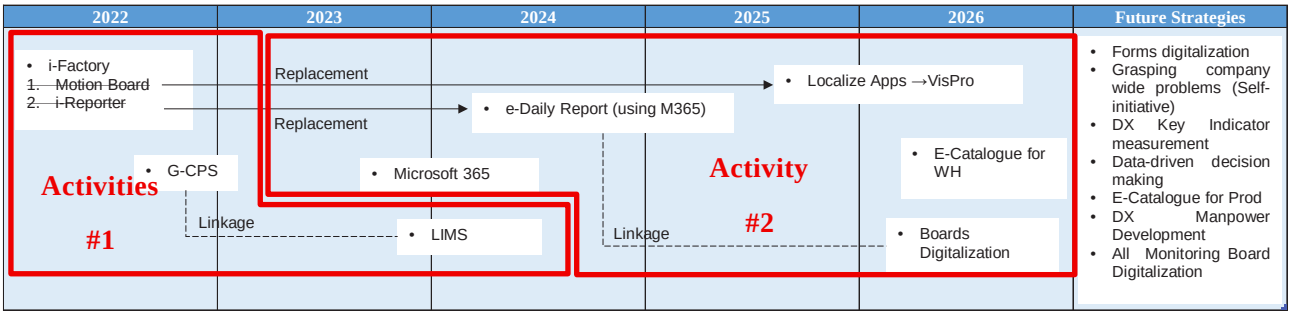


Figure 4.8-1 DX Transformation at CIC

(1) Introduction and Utilization of Applications

Through CAC, several applications—including G-CPS, i-Factory, and LIMS—were introduced to CIC. Figure 4.8-2 illustrates the relationships among these applications, and their respective overviews are explained below.

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1) G-CPS: This system is primarily responsible for production scheduling, inventory management, and other functions related to material usage. G-CPS users include Marketing and Purchasing, PPIC, Warehousing, Production, and Quality Control.

2) i-Factory: This system collects production process metrics and displays them on a visualization board, enabling the production department to use this data to monitor real-time performance. It also allows for a swift and timely response in the event of an anomaly.i-Factory consists of two components: Motion-board and i-Reporter. Motion-board is a visualization tool, while i-Reporter is a daily production reporting tool. The users of i-Factory are the production and maintenance departments.

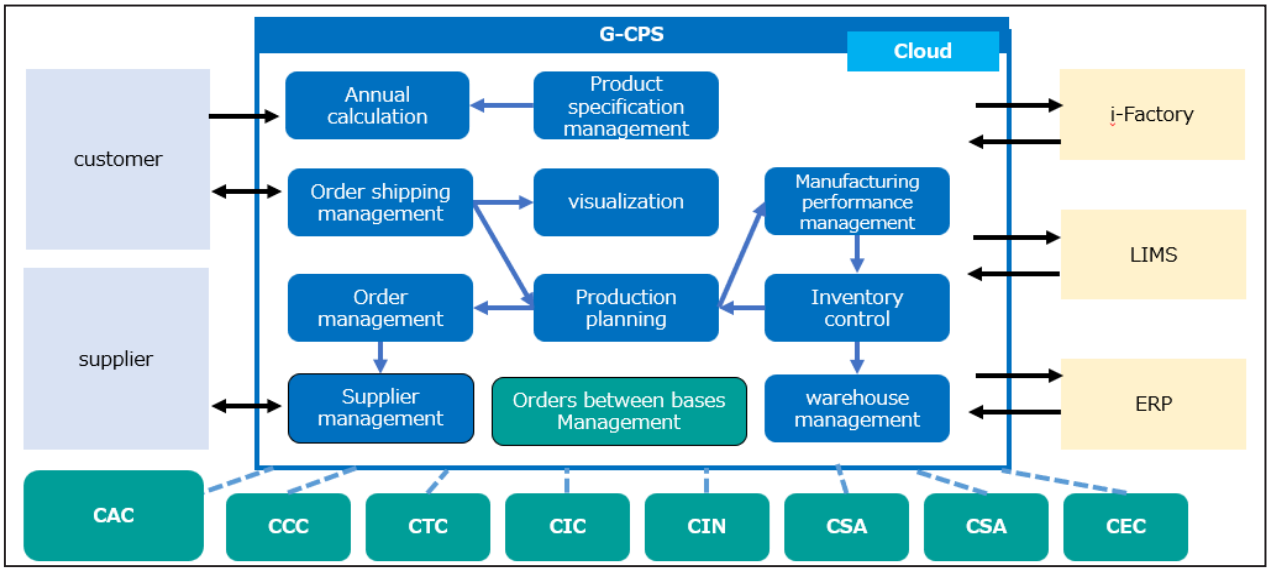


Figure 4.8-2 Relationships Among DX Applications

3) LIMS: This system collects information on inspection results and promptly notifies the production department. This enables the production department to respond to the results quickly and accurately. The users of LIMS are the quality control and production departments.

Prior to the introduction of the G-CPS system, several tasks related to production planning were recorded in separate Excel spreadsheets managed independently by each department. These were integrated into a single platform with the goal of speeding up data entry, minimizing errors, and significantly improving traceability. Next, i-Factory was introduced as a production monitoring tool, enabling real-time tracking of production process progress. When anomalies occur, these are utilized as early warning signals for further investigation, allowing for rapid corrective action to address irregularities in operations.

Subsequently, we implemented LIMS as a quality inspection tool. The concept behind LIMS is to minimize human intervention as much as possible and reduce errors caused by manually transcribing inspection results from equipment to production inspection request forms or by manual calculations. Furthermore, since the manufacturing department can immediately view results approved by the Quality Control (QC) department, we were able to accelerate the production process.

(2) Localized IT Applications

But the i-Factory system caused significant operational disruptions due to issues that occurred with extremely high frequency on a daily basis, such as high bandwidth requirements, frequent system errors, and excessive load on the web application.

Consequently, the decision was made to replace it with an application called VisPro. VisPro stands for “Visualization of Production.” Since this application is designed specifically for CIC’s network environment, it operates without an Internet connection, allows for the storage of historical data, and, through collaboration with a domestic vendor, enables a short lead time for recovery in the event of a failure.

At the same time, we conducted a thorough investigation of non-value-added activities within the company and prioritized digitization efforts in the production department, where such activities were most prevalent. In the production department, we implemented projects such as “e-Daily Report,” “e-Daily Supervisory Patrol,”

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and “Digitization of Production Boards.”The “e-Daily Report” replaced the traditional “Daily Report” system, in which operators used to handwrite their daily work results on paper. By utilizing Microsoft 365 tools , it addressed various issues such as entry errors, calculation errors, lack of input validation (where anyone could freely enter values), storage problems, distribution problems, and long lead times for reporting.

Furthermore, with a digital board called the “Production Summary Board,” production results are now automatically transferred from the “e-Daily Report” to the “Production Summary Board,” replacing the manual process of staff compiling the previous day’s production results.

In this way, through the localization of the application, internal members have actively engaged in the application design process, provided feedback during development, and gained practical experience through daily use. This collaborative involvement has fostered a stronger sense of ownership and enhanced users’ adaptability to the digital system.

4.8.4 Effects of Activities

(1) Tangible Effects

Non-value-added tasks were reduced from 311 hours per month to 179 hours by 2025 (Figure 4.8-3).

Specifically, VisPro reduced application access time (from 14 to 5 seconds), e-Daily Report reduced task completion time (from 70 to 36 seconds), and the visualization of the production overview board saved more than 4 hours.

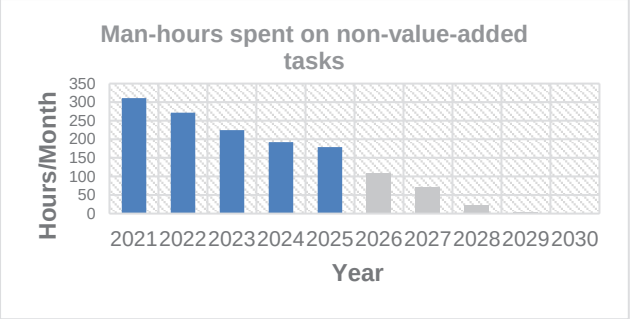


Figure 4.8-3: Non-value jobs reduction over the year and expected result in the coming year

(2) Intangible Effects

Utilizing the information collected through digital transformation (DX) enables objective, data-driven decision-making. Furthermore, information gathering has become faster, allowing for early detection of anomalies and prevention of further deterioration. Employees have become more deeply involved in analysis and improvement activities, fostering a sense of ownership toward continuous learning and quality improvement.

4.8.5 Future Plans

Currently, CIC’s digital maturity remains at Level 3(DX was promoted company-wide through a cross-departmental strategy). Over the next five years, we aim to elevate CIC to a Level 4(Implementing sustainable digital transformation based on measurable KPIs).

4.9 Small-group activities with an emphasis on teamwork (operation of QC Circles)

4.9.1 Overview

In 2014, the Company introduced QC Circles with the aim of strengthening frontline capabilities and promoting continuous improvement activities (KAIZEN). QC Circle activities serve not only as a means of operational improvement but also as important opportunity for human resource development, fostering problem-solving skills, communication skills, and a proactive attitude. Through participation in these activities, we aim to promote employee growth, revitalize the entire organization, and strengthen our competitiveness. However, we observed a lack of progress in overcoming weaknesses, disparities in performance levels among teams, and instances where initiatives did not lead to effective improvement (KAIZEN); consequently, we began efforts to strengthen the QC Circle system.

4.9.2 Focus of Activities

Problems Prior to TQM introduction

1. There are inconsistencies in the quality and themes of improvement activities across teams.
2. Root cause analysis is insufficient due to the lack of training in problem-solving.

Major Activities

1. Standardization of activity processes through the revision of the QCC System
2. Development circle member with implementation problem solving training

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4.9.3 Contents of Activities

(1) Establishing a framework for teams and individuals to continuously improve their skills through QCC activities

There are six key points to this framwork.

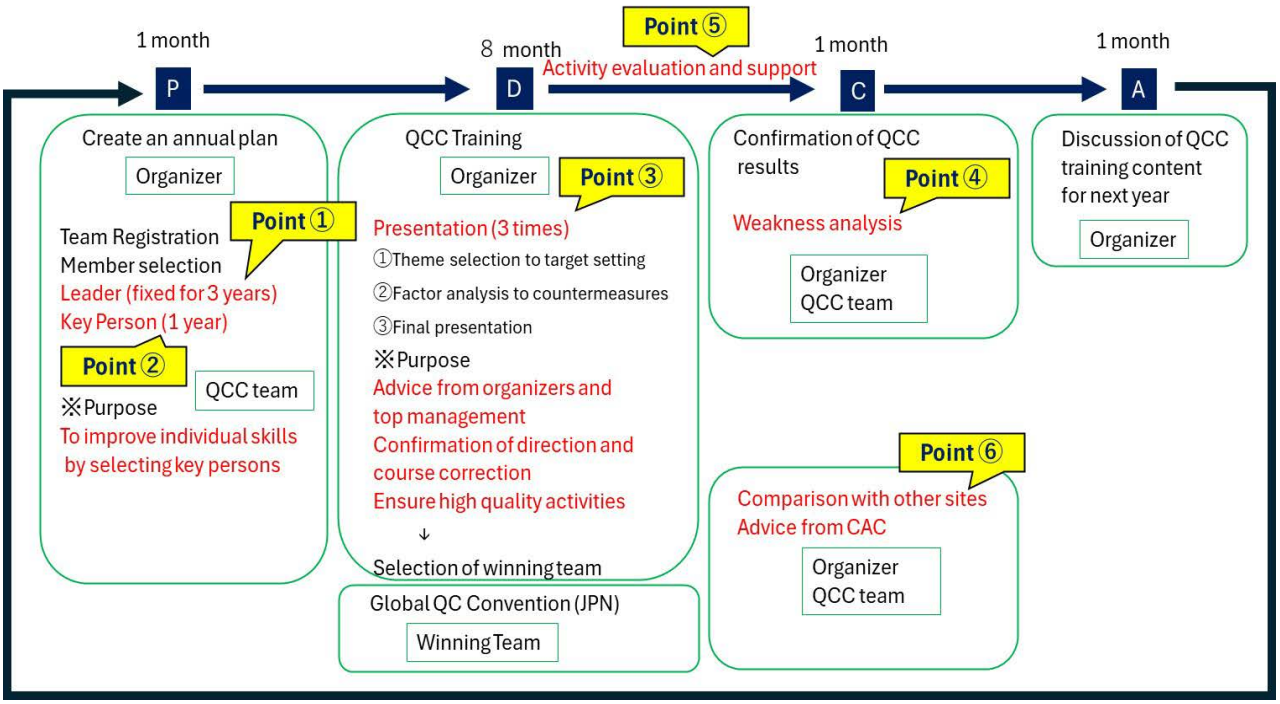


Figure 4.9-1 Overview of QC Circle Activities (Features of CIC)

1) Fixed Three years Term for Team Leaders

The fixed three-year term for team leaders is established with a structured purpose:

1. In the first year, emphasis is placed on education with activities focused on identifying issues.
2. In the second year, they address the identified issues and implement improvements.
3. In the third year, as the culmination of their leadership role, team leaders consolidate and finalize the activities.

The rationale for setting this three-year term is to enhance problem-solving skills through progressive development while also ensuring leadership regeneration, particularly in cases where leadership capability is still limited.

2) Assignment of Key Persons within the Team

Key persons are actively engaged in various initiatives and training, with short-term intensive programs designed to accelerate their development. The rationale for appointing a *key person* in each team is to provide education to new members, particularly those who do not yet possess sufficient skills and are not yet capable of solving problems independently.

3)Implementation of Three QCC Presentations

Through reporting that involves top management, guidance is provided on the approach, improvement measures are refined, and the overall direction is aligned to ensure that the activities lead to effective improvements. The reasons for conducting three presentations are:

1. To ensure that the progress of QCC report preparation remains on schedule or on time.

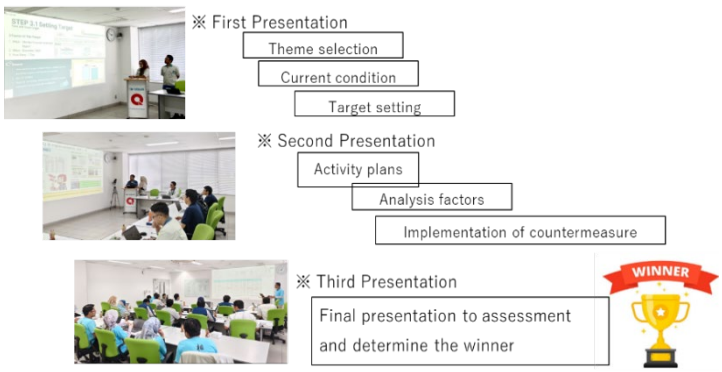


Figure 4.9-2: Three Presentations

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2. Each step in the preparation of QCC requires evaluation so that the report produced is substantial and of high quality.
3. To provide guidance and direction to each team so that QCC activities can enhance the performance of QCC team members.

4) Post-Activity Analysis and Future Development

Following the completion of activities, analyses are conducted to establish a framework that links outcomes to subsequent QCC initiatives. The Organizer takes the lead in identifying issues and initiating measures aimed at elevating the overall level of performance. This activity is carried out with the objective of enabling the Organizer to implement improvements in the steps that are considered less effective, thereby ensuring that the analysis serves not only as an evaluation but also as a foundation for continuous development of future QCC activities.

5) Introduce a QCC Activity Engagement Evaluation System

Regular assessments are conducted to verify whether QCC activities are being implemented by all team members. The Organizer provides close support throughout the process to ensure effective participation and sustained engagement.

Through the implementation of these initiatives, the capabilities of both individuals and teams have steadily improved. By combining post-activity analysis with the introduction of participation evaluations, a system was established to ensure that improvement efforts did not remain one-off initiatives.

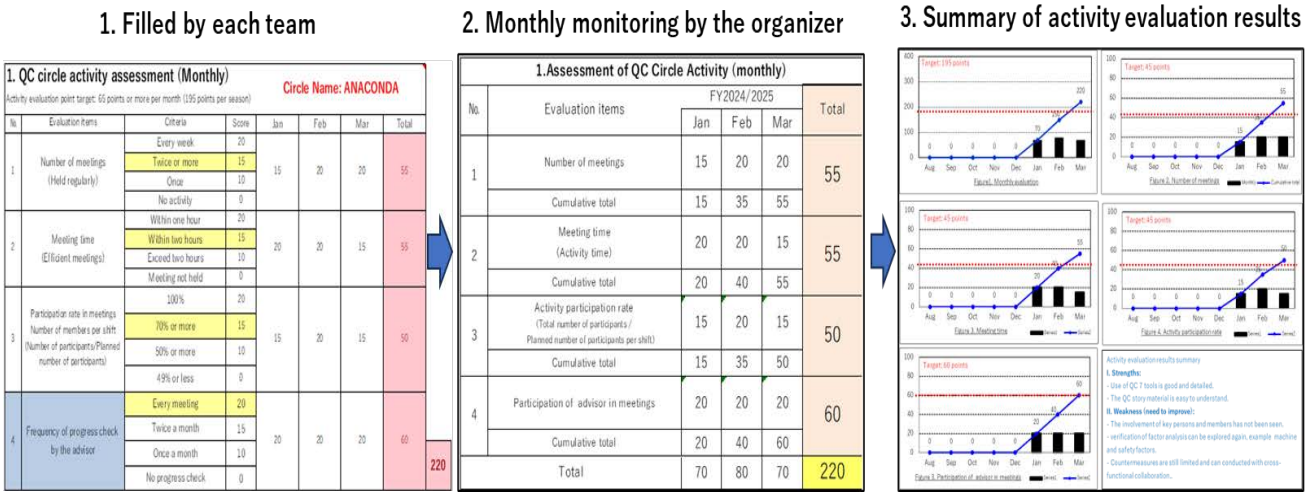


Figure 4.9-3 Results of QCC Activities

(2) Development Circle members with implementation problem-solving training.

To promote the acquisition of advanced problem-solving skills, a systematic training system was established with the support of headquarters, which is being expanded sequentially from section managers to supervisors and staff. In each training program, a minimum passing score is required for Steps 1 through 8 of the QC Story; if the score is not met, additional training is provided.

4.9.4 Effects of Activities

(1) Tangible Effects

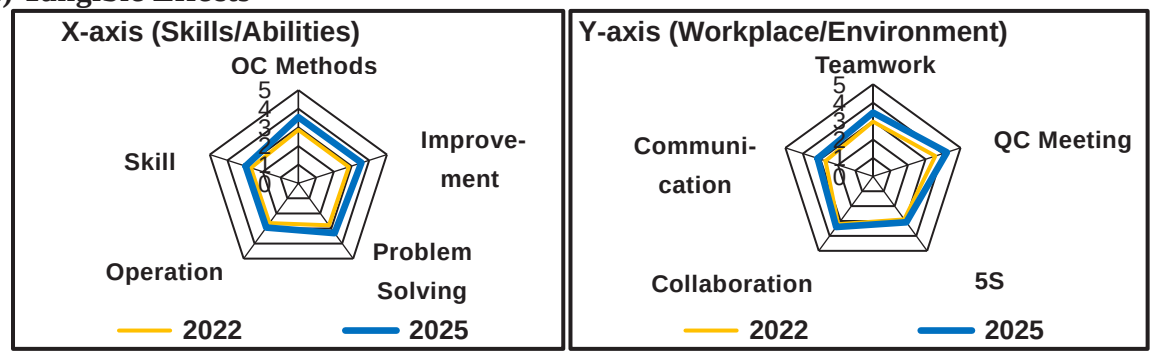


Figure 4.9-4 Evaluation Using an X-Y

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(2) Intangible Effects

As a result of the steady advancement of our QCC initiatives, our company was awarded the title of inaugural Global Champion at the 2024 Cataler Global QC Convention, which brought together eight sites including Japan. In the same year, members of our Secretariat also participated in a QCC Leadership Skills Contest organized by another company, with 50 firms taking part, and were likewise honored as champions. These distinguished achievements have significantly enhanced employee motivation across the organization.

4.9.5 Future Plans

At CIC, we have been working to establish problem-solving methodologies; however, certain themes have revealed the need to adopt issue-resolution-oriented approaches. In the coming fiscal year, we will broaden our improvement strategies by mastering a wider range of methods, including goal-achievement-oriented storylines.

4.10 Corporate Social Responsibility (CSR)

4.10.1 Overview

CIC's CSR activities are closely linked to its management philosophy: "Think and Act for ourselves on the respect for Indonesian culture and manners shall help us contribute to make the rich society."

As part of its efforts to improve the quality of education in the region, CIC provides educational support through donations to schools in neighboring areas. In the environmental field, CIC is committed to reducing CO_2 emissions and conducts regular monitoring of wastewater and waste to ensure responsible and sustainable management practices. Furthermore, CIC's products contribute significantly to reducing harmful components in automotive exhaust emissions (Figure 4.10-1).

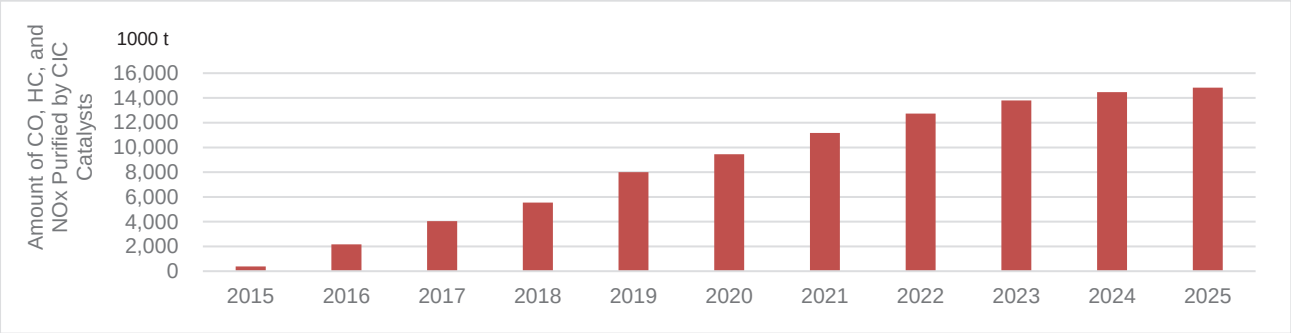


Figure 4.10-1 Amount of CO, HC, and NOx Purified by CIC 4W Catalysts

CSR activities help build a positive reputation by strengthening stakeholder trust, thereby contributing to the company's long-term sustainability.

4.10.2 Focus of Activities

Problem prior to TQM introduction	Major Activities
1. Risk of stagnation in CO_2 reduction activities. 2. The effectiveness of donations has not yet been measured.	1. Strengthening carbon-neutral activities. 2. Enhancing the effectiveness of donation initiatives.

4.10.3 Contents of Activities

(1) Strengthening Carbon-Neutral activities

CIC's CO_2 reduction program was launched in 2021. The Cataler Group has set a target of achieving carbon neutrality by 2035, and each location has been assigned reduction targets accordingly. In line with this, CIC has established a plan to reduce its emissions in stages toward 2035 and is actively working to achieve carbon neutrality by that year.

One method for achieving carbon neutrality is the use of Renewable Energy Certificates (RECs). RECs certify the environmental value of electricity generated from renewable sources, rather than the electricity itself. By

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purchasing RECs, companies can claim the use of renewable energy even when they consume conventional electricity. Through the purchase of RECs, CIC achieved zero electricity-derived CO_2 emissions as of FY2023.

However, if CIC reduces its electricity consumption, it will need to purchase fewer RECs, and the unused certificates can then be used by other organizations. This allows non-CO_2-emitting energy to be used more widely across society, which ultimately contributes to social progress. For these reasons, CIC continues to implement initiatives aimed at further reducing its CO_2 emissions.

Figure 4.10-2 illustrates the process of CIC's CO_2 reduction initiatives. Initially, CIC established its own reduction targets based on the goals set by CAC. Each section then identifies and lists specific actions to reduce CO_2 emissions. These actions are implemented accordingly, and their outcomes are reviewed during the CO_2 Reduction Meeting. Following this review, the achievement level of the targets is assessed, and targets for the subsequent year are discussed and determined.

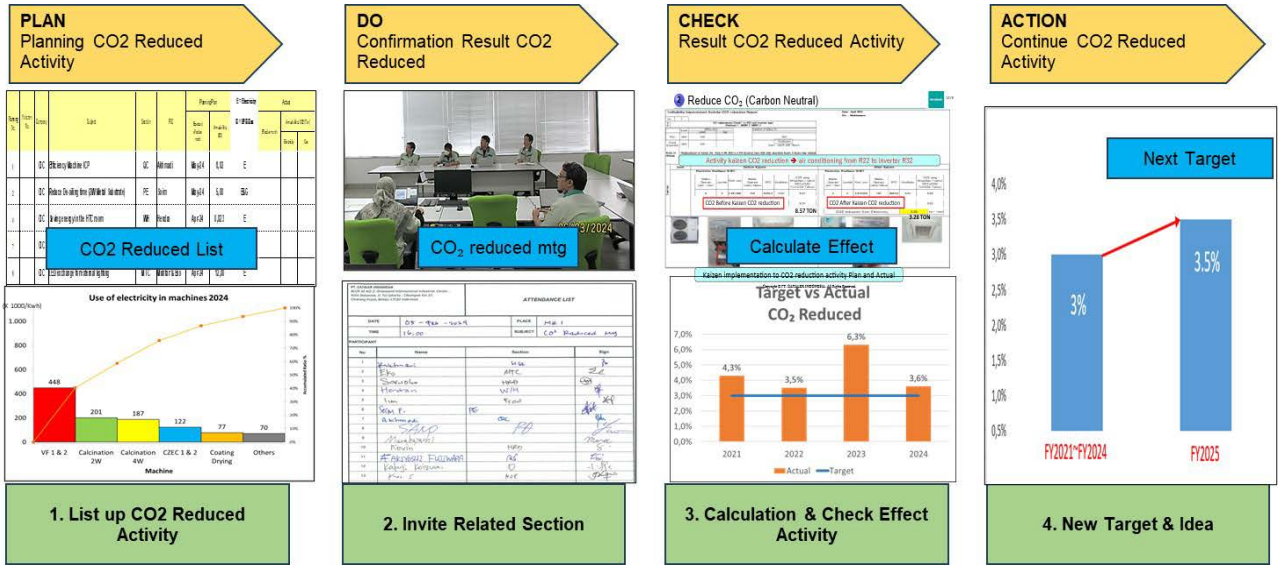


Figure 4.10-2: The PDCA Cycle for CO_2 Reduction Activities

(2) Enhancing the effectiveness of donation Activities

Based on its corporate philosophy, CIC has been conducting CSR activities since 2015 that focus on educational and health support for elementary school students in neighboring communities. As shown in Figure 4.10-3, these activities are carried out in accordance with a “Donation Plan.” Donated items are selected to meet the specific needs of each school and include books, computers, school supplies, and soccer balls. These ongoing efforts contribute to enhancing the company’s reputation and demonstrate CIC’s commitment to being a company valued by its employees, their families, and the local community. Furthermore, these initiatives

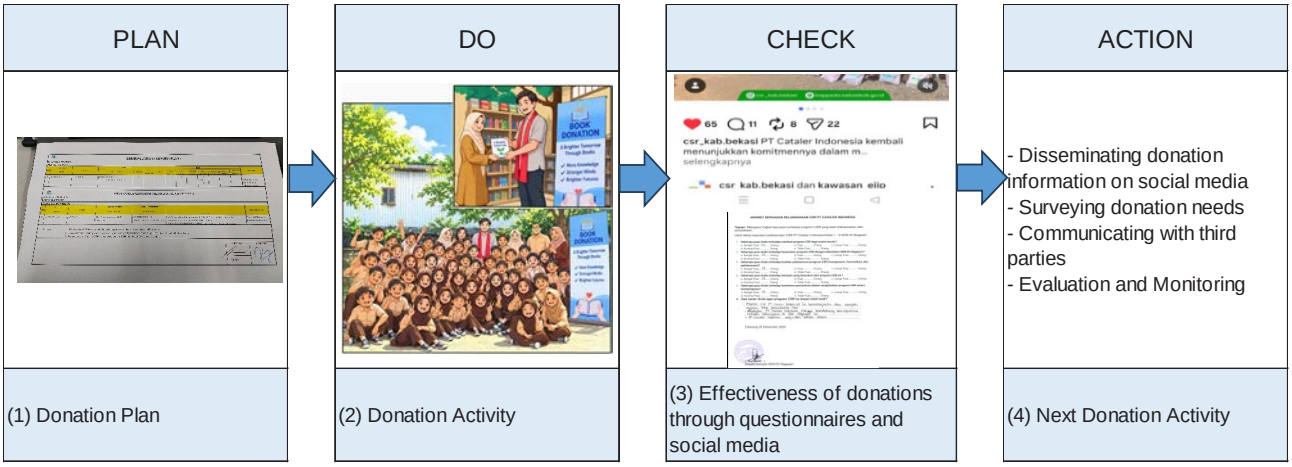


Figure 4.10-3: The PDCA Cycle for Donation Activities

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contribute to the Bekasi Regency Government's CSR program and help raise awareness of CIC among the general public, other companies, and government agencies.

Starting in fiscal year 2025, CIC began sharing its activities on social media platforms such as Instagram and government-approved WhatsApp groups for businesses, and has incorporated the number of "likes" as one of its evaluation metrics. We hope that this initiative will be recognized by the local community, raise our profile throughout Indonesia, and promote understanding of our environmental contributions through our core catalyst business.

In the future, we aim to further increase CIC's visibility among the general public by encouraging children from neighboring communities to join CIC and continue contributing to society and the environment.

4.10.4 Effects of Activities

(1) Tangible Effects

CO_2 Reduction: From fiscal year 2021 through fiscal year 2024, CIC's CO_2 emission reduction activities exceeded the target of 3%. In fiscal year 2025, we set an even higher reduction target of 3.5% and achieved a 4.6% reduction.

Donations:

The evaluation of donation activities only began in 2024, and the results have not yet been fully compiled. To enhance the effectiveness of its programs, CIC has established partnerships with relevant organizations, local communities, and all stakeholders. Through these partnerships, the company expects to gain greater recognition and appreciation within Indonesia while reinforcing its positive image as an organization that prioritizes education, health, and social welfare.

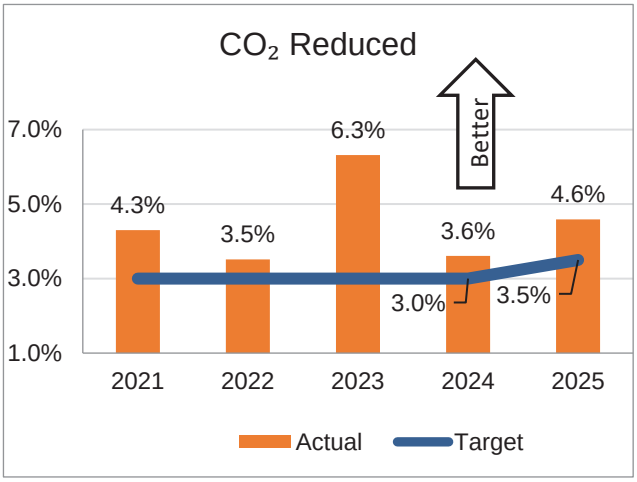


Figure 4.10-4 Result of CO_2 reduction activity

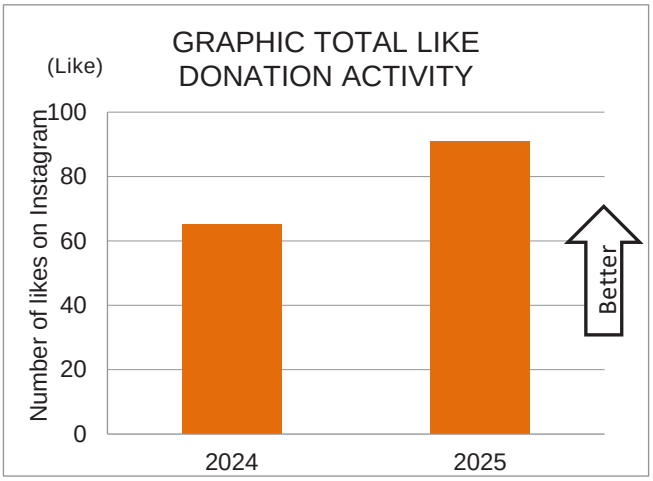


Figure 4.10-5 Result of Donation Activity

(2) Intangible Effects

Employees can deepen their understanding of energy efficiency and sustainable resource use, and through social contribution activities, they can enhance the trust that the general public, consumers, and local communities have in the organization and its employees.

4.10.5 Future Plans

CIC will continue to implement CSR activities with the aim of supporting business development and the sustainability of its employees, local communities, and the global environment.

1. Introduction of energy-efficient equipment in future production processes (PE).
2. Visualization of environmental data through digitalization (HSE, PE)
3. Implementation of social and environmental contribution activities (GA) involving employees, affiliated organizations, and the local community.

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5. Overall Effects of TQM Implementation

5.1 Tangible effect

To achieve the three Management objectives that CIC aims to accomplish by FY2028, we have been implementing challenging activities utilizing TQM methods based on our strategies since FY2022. The overall effects obtained so far are summarized below.

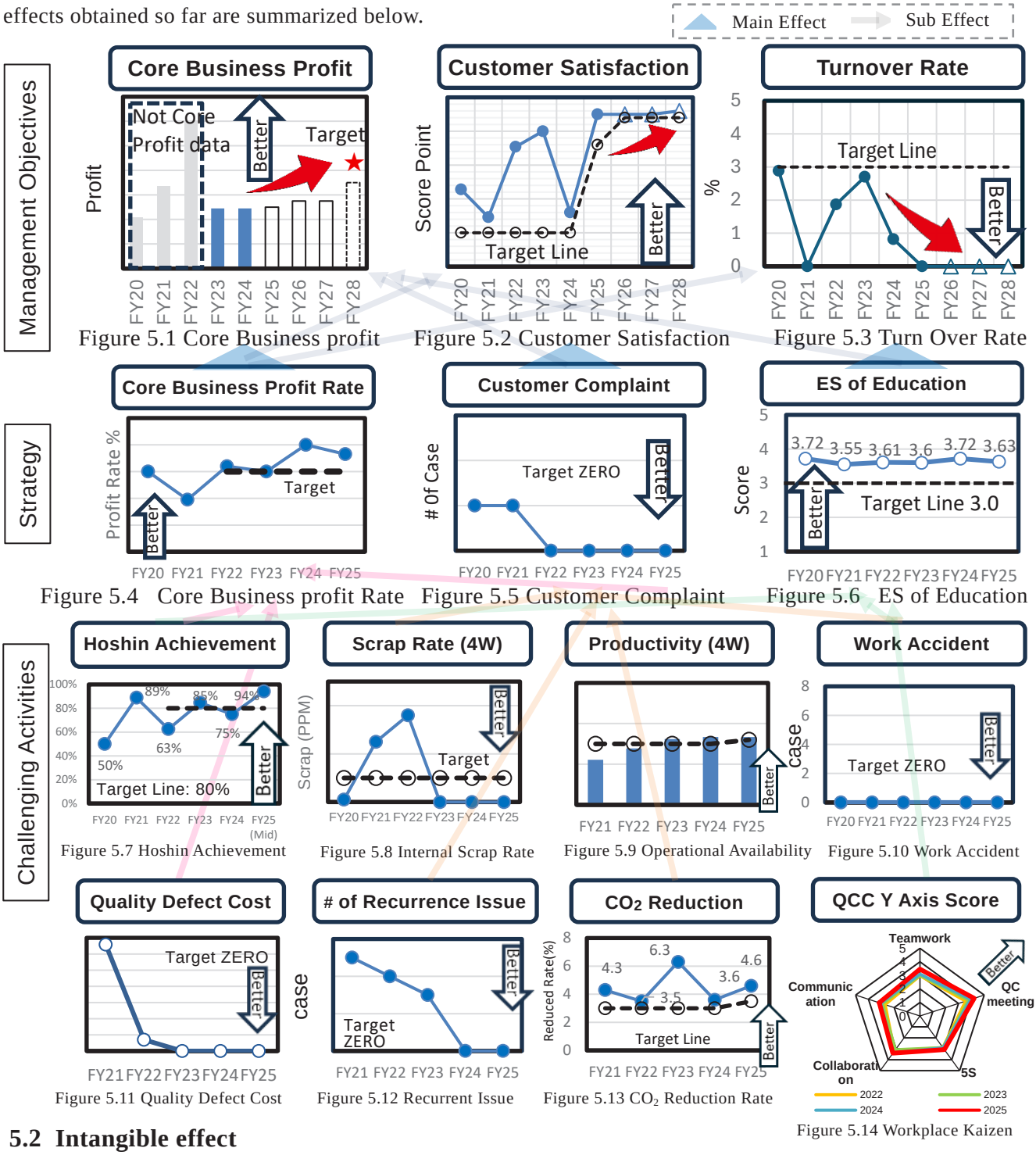


Figure 5.1 Core Business profit
Figure 5.2 Customer Satisfaction
Figure 5.3 Turn Over Rate
Figure 5.4 Core Business profit Rate
Figure 5.5 Customer Complaint
Figure 5.6 ES of Education
Figure 5.7 Hoshin Achievement
Figure 5.8 Internal Scrap Rate
Figure 5.9 Operational Availability
Figure 5.10 Work Accident
Figure 5.11 Quality Defect Cost
Figure 5.12 Recurrent Issue
Figure 5.13 CO_2 Reduction Rate
Figure 5.14 Workplace Kaizen

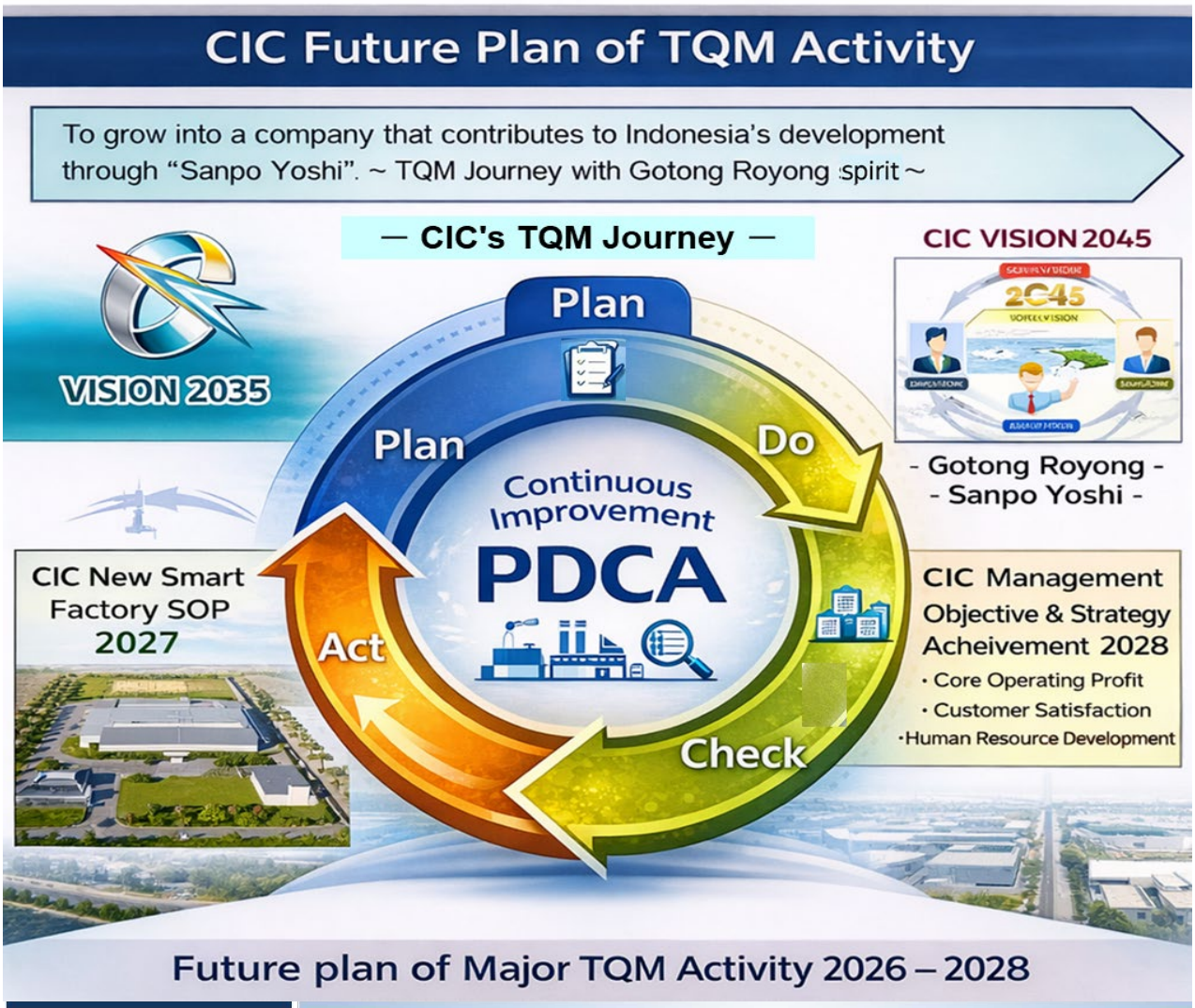
5.2 Intangible effect

1. Through TQM activities, CIC has fostered a culture of continuous growth by emphasizing purpose-driven and customer-focused thinking, quantifying indicators, and encouraging participation from all employees.
2. During the Quality Month in November 2025, a themed exhibition on "TQM" was held, and the results of the survey confirmed that all employees have gained a deeper understanding and more positive impression of TQM activities.
3. Through TQM activities, employee awareness has improved, various systems have been strengthened, and a solid foundation has been established in preparation for the increased production capacity planned for FY2027.

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6. Future plan

We will further promote TQM activities to achieve our management targets for fiscal year 2028. In the immediate future, we will strengthen proactive sales activities, enhance both general and specialized education, and establish a system where qualifications, grades, evaluations, and rewards are fully linked. We will also build a new smart factory to meet the needs of our customers and employees. On an ongoing basis, we are committed to maintaining zero labor accidents, thoroughly improving profitability, preserving high quality, and ensuring the prevention and recurrence of defects. Looking further ahead, we aim to become a company that can sustainably realize the CIC Vision of “Sanpo-yoshi,” benefiting all parties involved.



Future plan of Major TQM Activity 2026 – 2028

Hoshin Management	・Ensure accurate reflection of the revised global mid to long-term plan in CIC ・Strengthen SURIAWASE process, improve the quality of Mendomi Yorisoi
Daily Management	・Crete Smart Plant Factory scenario to maximize QCDMS daily management output
Cost Management	・Build models to visualize the impacts of currency and PGM price changes ・Design for advanced Profit Improvement / Financial Control
Customer-Oriented Sales	・Evolve from reactive to proactive and proposal-based sales
Quality Assurance	・Early absorption of quality information and immediate feedback to R&D ・Utilize LIMS to leverage Quality data and prevent quality fraud in advance
Human Resource Development	・Complete linkage between qualification, grading, evaluation, and compensation ・Autonomous evolve of people and organizations

Figure 6.1 CIC Future Plan

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２０２６年度

デミング賞
受賞報告講演要旨

独立行政法人国立病院機構 仙台医療センター

1　病院概要

1.1 概要

病院というサービス業において、提供するものは医療である。病院の顧客は診療に訪れる患者であるが、病院の診断機能を直接利用する地域の医療機関も顧客にあたる。また、地域の医療機関は地域連携の仕組みのもとに、一次顧客である患者を紹介するという二次顧客の側面も有する。

製品の価値としての医療の対価は、自由診療などの例外を除き、国が定める診療報酬制度により、全国一律に規定されている。診療報酬制度では、医療の質がある程度は報酬額に反映される。7:1 看護(患者 7 人に対し看護師 1 人を配置：かなり高密度の配置となる)や、全身麻酔手術数などが加算対象となり、高度の診療を行っていればいるほど診療報酬は高くなる。ただし、診療報酬で評価するのは数値のみであり、実際の内容に関わらない。このため病院は、顧客獲得のために、実質的な医療の質とサービス内容によって差別化を図る。

1.2 機能と役割

独立行政法人国立病院機構(NHO)仙台医療センターは、1937 年に仙台陸軍病院臨時宮城野分院として創設されて以降、90 年近くの歴史を有する。当院の沿革を表 1-1 に示す。前身が厚生労働省直轄の施設であったため、政策医療の北海道・東北地区の拠点であった。この機能は現在も継承されており、東北ブロックエイズ拠点病院、宮城県基幹災害医療センターなどを担当している。

2004 年に、厚生労働省直轄の医療機関が改変された。一部の医療機関(ハンセン病療養所)は厚労省直轄として残ったものの、大部分の医療機関は独立行政法人となった。当院もその流れで 150 以上の病院からなる NHO に再編された。その際に独立行政法人国立病院機構法という法律が制定され、現在も当院はこの法律に準拠している。NHO は現在では 140 病院からなり、全国を 6 つのグループにわけて運営している。給与体系は NHO 全体で一律であり、職員の採用はグループの管轄であり、グループ内での転勤がある。

事業の収支は病院個々で集計するが、最終的には NHO 全体で 1 法人としての収支となる。NHO 全体でみてもグループ内でみても、当院のように急性期治療を手掛ける病院から、セーフティネット医療(重度心身障がい児[者]や難病など民間の医療機関では必ずしも実施されないであろう医療)中心の病院、精神科中心の病院など多岐にわたり、極めて不均質な集合体である。このため NHO あるいはグループ共通の理念や運営方針は、最大公約数的な部分に留まり、詳細については個々の病院に任せられている。

当院は 20 病院からなる北海道東北グループに属しており、660 床、34 診療科を備え、主として急性期医療を提供している。病床数は、宮城県内では東北大学病院に次ぐ第 2 位で、東北医科薬科大学病院を上回る。当院の規模を表 1-2 に示す。

表1-1　沿革

1937年	仙台第一陸軍病院宮城野原分院として創設
1945年	厚生省に移管、国立仙台病院として発足
1978年	救命救急センター、脳卒中センター設置
1978年	母子医療センター設置
1983年	地域医療研修センター設置
1996年	東北ブロックエイズ拠点病院として指定
1997年	宮城県から基幹災害医療センターとして指定
1999年	日本医療機能評価機構より「一般病院種別B」に認定
2004年	独立行政法人国立病院機構仙台医療センターに移行
2005年	地域医療支援病院に承認
2006年	地域がん診療連携拠点病院に指定
2008年	ISO9001：2000認証取得
2010年	BFH（赤ちゃんにやさしい病院）認定
2016年	宮城県ドクターヘリ運航
2017年	ISO9001：2015認証更新
2019年	新病院へ移転開業（病床数698床→660床）
2023年	ビジョン2028策定

表1-2　規模

病院区分	地域医療支援病院
定床数	660床 (一般628床、精神32床)
診療科目	34科
診療実績（2024年度）	
外来患者	231,346人(952人/日)
入院患者	181,703人(497人/日)
救急外来受診者	8,293人
救急車受入件数	5,806件
手術件数	4,801件
紹介件数	18,193件（紹介率89.1%）

1.3 組織

組織図を簡略化しまとめたものを図 1-1 に示す。当院は、10 の部で構成される。このうち、臨床研修部、地域医療連携部、診療支援センター部は、副院長の直轄でなく、統括診療部内に設置されている。統括診療部は、医師、歯科医師の全てが所属するとともに、診療放射線技師、臨床検査技師、管理栄養

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士、理学療法士、作業療法士、言語聴覚士、臨床工学技士も包括する。薬剤部は薬剤師と薬剤助手、看護部は看護師と看護助手が所属し、各々の部署が職務を遂行している。

日常業務を行う上では、各部の横断的な委員会を設けて、円滑な病院運営を企図している。

2023 年 11 月に新たに設置した将来計画検討委員会は、当初は将来計画検討部門を統括するところに位置付けたが、全ての委員会の上部組織が必要だと考えたため、将来計画検討委員を病院運営会議と改称し、総合品質管理推進部門と運営・計画検討部門(旧将来計画検討部門)の両方にまたがる意思決定最上位会議体とした。

2026.1.1時点

組織図			職員数	主な業務
院長	副院長	統括診療部	各診療科	230	患者診療
			診療放射線科	31	放射線検査、放射線管理
			臨床検査科	43	検体検査、生理検査
			栄養管理室	13	栄養指導、栄養管理、献立作成、調理
			リハビリテーション科	38	理学療法、作業療法、言語聴覚療法
			臨床工学室	12	医療機器管理、医療機器操作
		臨床研修部	臨床研修室	(2)	研修医の養成
			専門医研修室	(2)	専門医の養成
		地域医療連携部	地域医療連携室	18	地域連携、入退院支援
			がん診療連携室	2	がん診療連携
		診療支援センター部	診療支援センター室	(2)	医師の人員配置調整
			医師業務支援室	31	医師業務支援
		総合品質管理推進部	ＴＱＭ推進室	4	医療の質改善、向上
			感染対策室	4	感染症に関わる情報収集および情報提供
			医療安全管理室	5	医療安全に関わる情報管理および指導
			国際医療協力室	(2)	海外とのウィルス学共同研究
		臨床研究部	領域別研究室	(5)	ウィルス疾患、がん病態、循環動態、病態解析、医療の質研究
			治験管理室	6	新薬開発の臨床試験
		薬剤部		33	薬剤管理、医薬品情報管理、服薬指導
		看護部		661	患者看護
		事務部	企画課	48	経理、契約、事業計画　等
			管理課	46	人事、労務　等
		情報管理部	情報管理室	13	診療情報管理、診療情報統計分析
学校長			看護学校	27	看護学校運営
			総職員数	1265	※　職員数欄の（　）内は併任職員数

図 1-1 組織図(簡略版)・業務分掌説明書

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2　経営概要

2.1　経営目標と経営戦略

2.1.1 経営目標

当院は、140 病院からなる国内最大の病院グループ NHO の一員である。NHO の理念と、当院の基本理念を表 2-1 に示す。当院の基本理念は、NHO の理念を踏まえたものである。当院の経営目標は、これらの理念に則った医療を展開することである。

表 2-1　国立病院機構の理念と当院の基本理念

組織	名称	内容
国立病院機構本部	理念	・国民一人ひとりの健康と我が国の医療の向上のためにたゆまぬ意識改革を行い、健全な経営のもとに患者の目線に立って懇切丁寧に医療を提供し、質の高い臨床研究、教育研修の推進につとめます。
国立病院機構 仙台医療センター	基本理念	・最善の医療を尽くして社会に貢献します。 ・患者さんにやさしく働きがいのある病院を目指します。

2.1.2 ポストコロナの医療環境

2019 年に中国武漢に端を発した COVID-19 は、2020 年 4 月 7 日の緊急事態宣言により日本国中を巻き込む事態となった。いわゆるコロナ禍であるが、これは 2023 年 5 月 8 日に、COVID-19 が 5 類感染症に移行したことにより、一応の終息をみたことになっている。しかし、コロナ期間中の受診控え、診療間隔の長期化などにより、コロナ禍以降多くの急性期病院が患者数確保に難渋している。

2.1.3 経営戦略

これまで当院では、年度ごとに病院の方針を提示し、これを受けた各部署が目標設定を盛り込んだ年度計画を立案・実施することにより、方針管理を行ってきた。しかし、これらは単年度で完結するため、長期的な方針を十分に展開できない点が課題であった。また、前項で示したポストコロナという経営環境の変化に対応しなければならない。

そこで、中長期目標であるビジョンを策定し、一貫性のある年度事業計画を立案できるように，方針管理の仕組みを変更した(表 2-2)。ビジョン自体は変更なく掲げるものの、これを具体化するための基本方針は少しずつ修正しながら中長期計画を実行している。2025 年度は、診療面では 4 つの基本方針を設定した。現在 TQM を活用して、全職員の力を結集して、ビジョンの実現に向けて取り組んでいる。

表 2-2 中長期計画

【ビジョン 2028】
・地域に選ばれる高度急性期病院 ・職員が誇れる働きがいのある病院
【基本方針】(2025 年版)
① 医療の質の継続的改善 1. 地域との医療連携と情報共有 2. 社会のニーズに対応した病院経営 3. 質の高い医療従事者の育成 4. 職員の働く環境の改善 ② 臨床研究の活性化

2.2　経営方針とその展開

2.2.1　概要

当院は、2004 年の独立行政法人化以降、2-1 で示した基本理念および単年度の病院目標/部門目標を設定し、ISO 9001 を基盤とした日常管理を中心に TQM 活動を推進してきた。しかし、これらの目標は網羅的であり、日常業務の改善には一定の効果を上げていたものの、急激に変化する外部環境に対し、中長期的な視点で病院全体の方向性を示し、経営資源を重点配分する仕組みは十分とはいえなかった。

その一方、少子高齢化の進行、医療人材不足、仙台医療圏における過剰な病床数、2 年ごとの診療報酬改定に伴う様々な算定要件の変化など、病院を取り巻く環境は一層厳しさを増している。地域医療構想において、高度急性期病院として中心的役割を担う当院には、“質の高い医療の継続的提供”と、“安定した経営“の両立が強く求められている。この課題に対応するために、当院では従来の日常管理中心の TQM から一歩進め、中長期ビジョンに基づく方針管理を、経営の中核に据える取り組みを開始した。

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2.2.2　活動の重点

＝課題・問題点＝

(1) 病院理念や単年度目標は設定されていたものの、それらは網羅的であり、中長期的なビジョンから逆算して重点を定め、経営資源を配分する仕組みが十分ではなかった。

(2) 急激に変化する外部環境に対し、病院経営としての問題の認識や方針が職員に十分共有されておらず、各部門と病院全体の方向性との結びつきがわかりにくい状況にあった。

(3) 部門ごとの目標管理は行われていたが、病院全体の課題に対して部門、職種横断的に取り組む仕組みが不十分で、組織としての力を十分に発揮できていなかった。

＝活動の重点＝

(1) 病院の将来像を明確にする中長期ビジョン（ビジョン 2028）の策定

(2) ビジョンから逆算した基本方針、重点課題の設定と、病院全体で共有、管理する仕組みの構築

(3) 部門、職種の壁を超えた横断的課題解決を可能にする方針管理体制の確立

2.2.3　実施状況

(1) ビジョン 2028 の策定

当院は、宮城県の中で東北大学に次ぐ規模の人員と設備を有しており、高度急性期病院として地域への役割が果たせるように、東北大学から医師の集中的な配備も行われている。また、当院から東へ 6 km の距離に位置している東北医科薬科大学病院は、当院と同規模・同機能を持ち、診療圏もかなり重なる。新設大学ではあるが、専攻医数を急速に増大させており、経営的な脅威となりつつある。さらに、厚労省が進める地域医療構想として、市内大規模病院の再編・合併が進行中であり、当院の高度急性期病院としての機能を、より強化しなければならないという制度的な要請もある。

このような課題を踏まえ、当院では、まず病院全体の将来像を明確にすることが不可欠であると判断した。そこで 2023 年 11 月、病院運営会議を中核とした議論の場を設け、当院を取り巻く外部環境および内部状況について多面的な分析を行った。

具体的には、COVID-19 に伴う一時的な補助金終了後に顕在化した、患者数減少による経営悪化の状況（図 2-1）を共有するとともに、仙台市における高度急性期医療需要の推計、病床機能報告に基づく必要病床数、ならびに市内大規模病院間の競争状況について調査した。その結果、高度急性期医療の需要は相対的に限られているが、仙台医療圏全体としては病床数が過剰であり、今後は単に機能を維持するだけでは、安定した経営は困難であるとの共通認識に至った。また、上位組織である NHO の中期目標である地域医療への貢献を踏まえた場合にも、地域の医療機関および住民から選ばれる病院であることが不可欠であるとの結論に達した。これらの議論を経て、当院の将来像を「地域から選ばれる高度急性期病院」と定め、2028 年を目標年次とする中長期ビジョンであるビジョン 2028 を策定した。

入院患者数（1 日平均／人）

2018年度	2019年度	2020年度	2021年度	2022年度	2023年度	2024年度
548.9	512.7	485.6	505.7	488.9	496.5	521.4

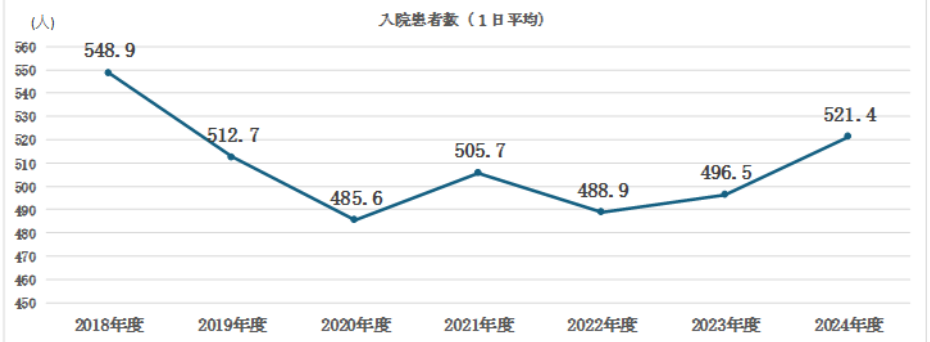


図 2-1　当院における入院患者数の推移

(2) 方針管理の仕組みづくり（図 2-2 方針管理体系図）

ビジョン 2028 の実現に向け、次に取り組んだのが、ビジョンから逆算して病院全体の活動を統合的に管理する方針管理の仕組みづくりである。従来、当院では院長、幹部、TQM 推進部長らによって、ISO

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9001 に基づき、全部門を対象とした TQM ヒアリング（経営指標、ISO 活動、部門・部署の単年度目標の議論）を春に、経営指標を中心とした経営ヒアリングを秋に実施してきた。しかし、これらは日常管理の確認が中心であり、ビジョンや重点課題を強く意識した、方針管理のフォローアップとしては十分ではなかった。そこで、2023 年度秋以降はヒアリングの位置付けを見直し、年 2 回とも TQM ヒアリングとして実施することとした。春のヒアリングでは、ビジョン 2028 および当該年度の基本方針・重点課題を踏まえた、各部門の方針管理の内容を中心に議論し、秋のヒアリングでは、その進捗状況と日常管理指標の達成状況を確認する運用に変更した（図 2-3）。

さらに、2024 年度からは、新たに構築した方針管理の仕組みをマネジメントレビューの中心に据えた。具体的には、基本方針に基づく重点課題に紐づいたテーマを選定し、その達成状況や課題を病院運営会議で総括・評価したうえで、次年度の基本方針および重点課題の見直しにつなげるサイクルを確立した。

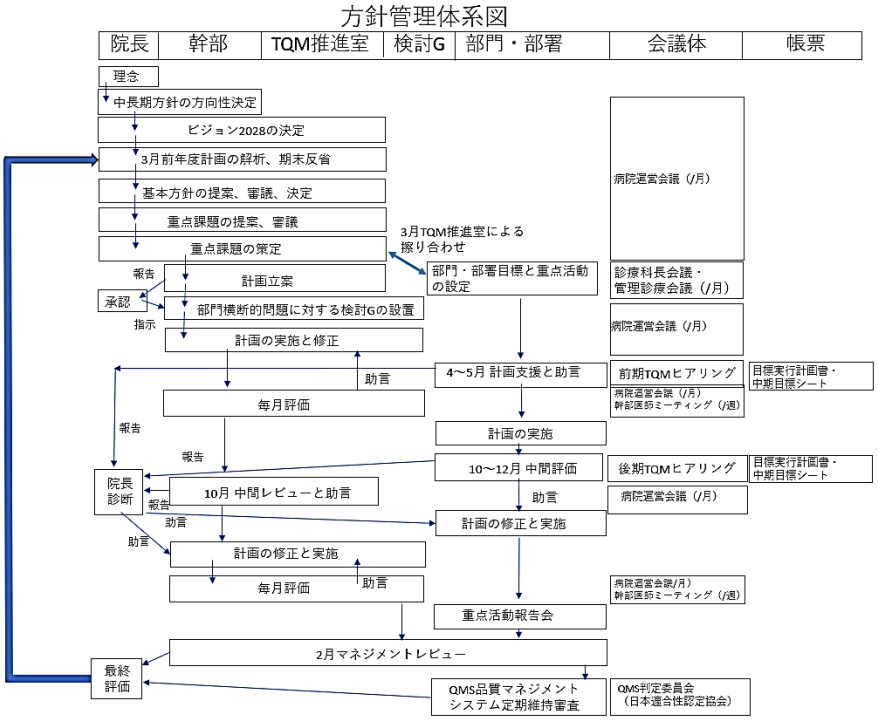


図 2-2　方針管理体系図

方針管理指標	2025年度病院目標重点課題		部門・部署目標	目標値	中間評価（施策に対する具体的活動内容および結果）	これまでの達成状況について、下記の４つのうちあてはまるものを、1つ選んで		後期の課題
	今年度の重点活動					未実施だが達成できた	計画通り達成できた	
		1.①患者紹介件数増及び紹介患者入院者数増	総診入院患者数の増加	入院患者 215 名/年 前年＋20% 外来紹介患者 60 名/月 前年維持	① 前期の新入院患者数は84名であり、目標を下回るペース、かつ昨年度の105名を下回った。退院調整の早期介入を行い、平均在院日数は若干短縮した（17.3→17.0）。一方で人員的な理由等で日中の救急外来経由の入院、日直・当直の入院患者数（薬物中毒患者など）の減少があり、新入院数が低下した。			・入院患者増のためには救急外来経由の入院増が必要であり、救急科と連携する必要がある。 ・9月から救急科からの転科患者を増やしているが、さらに増やす。 ・10月からの科の人員増を生かし、総診としての日中救急車の受け入れを増やす。
					②外来紹介患者数は56名/月でありわずかに減少。連休明けに予約外来数が少ない傾向が見られた。予約外来患者の入院率は例年通り低いが、前期は特に他科への入院が目立った印象がある。	未実施かつ未達	実施したが未達	
							○	

	項目	基準値	4月	5月	6月	7月	8月	9月
日常管理指標	①退院サマリの期限内作成率	90%	○	×	○	○	○	○
	②外来返書の作成率（初回返書1週間以内、最終返書2週間以内）	95%	○	○	○	○	○	○

図 2-3 総合診療科の部門・部署目標中間評価

(3) 部門横断的な方針管理の展開

重点課題の多くは単一部門で解決できるものではないことから、病院運営会議の下に部門横断的な検討グループを設置し、方針管理を展開した。当初は、救急医療、地域医療連携、手術室運用改善、診療

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業務効率化、病床管理、収益部門経営改善、支出部門経営改善の 7 つのワーキンググループ（WG）を設置し、副院長や統括診療部長等がリーダーとなり、多職種のメンバーを指名して活動を開始した。その後、各課題の進捗状況や病院を取り巻く環境変化を踏まえ、病院運営会議において検討グループの再編を行い、現在は重点課題との対応関係がより明確になるよう体制を整理している。

具体的には、手術室運用改善 WG の代わりに、がん化学療法室の運用やがんゲノム医療に関する課題に対応するため、がん診療検討 G を新設した。さらに、救急医療 WG と病床管理 WG の検討事項を医師当直体制検討 G に統合して、1. 医師当直体制検討 G、2. 地域医療連携検討 G、3. 診療業務効率化検討 G、4. 経営改善（収益部門）検討 G、5. 経営改善（支出部門）検討 G、6. がん診療検討 G を設置することとした。（図 2-4）これらの検討グループは、毎月病院運営会議に活動報告を提出し、進捗状況や課題について評価を受けて、改善につなげている。

幹部医師は毎週幹部医師ミーティングを行い、各検討グループの進捗状況を議論している。また、病院運営会議の検討 G に該当しない重点課題については、委員会で、課題の達成状況を管理している。病院運営会議での議論結果は、必要に応じて活動内容の修正や新たな対応策の検討に反映され、半年ごとの中間レビューおよび年度末のマネジメントレビューの重要なインプットとして活用されている。

2.2.4　効果

(1) ビジョン 2028 の策定

院長、幹部がビジョン 2028 を全部門に繰り返し発信、説明することで、病院として目指す方向性が明確になった。これにより、個人や部門の活動の動機付けが明確となり、仕事の優先順位も決めやすく、上司も部下に対する指示を出しやすくなった。結果として、部門単位の最適化にとどまらず、病院全体の最適化を考えた行動が増加した。

(2) 各部門における方針管理

ヒアリングを年 2 回行うことで、医療の質のみならず、経営に対する各部門・部署の意識が高まった。2024 年度からは従来の ISO 活動に加え、TQM ヒアリングと病院運営会議の総括もマネジメントレビューにおいて討議し、次年度の基本方針や新しい重点活動 2025 へ繋げることができた。従来の日常管理中心の議論から、重点課題の達成を意識した目標設定や進捗管理へと変化し、部門・部署目標実行計画書に基づいた具体的な改善活動が促進された。

(3) 部門横断的な方針管理

部門横断的な検討グループを設置し、重点課題に対して組織的に取り組んだ結果、複数の指標で改善が認められた。具体的には、地域医療連携に関する取り組みにより紹介患者数が前年比 13%増加し、新入院患者数も 5%増加した。診療業務効率化の取り組みにより逆紹介数は 7%増加し、病床管理の改善により救急外来から病棟入室までの時間短縮(4%短縮)が図られた。さらに、手術室運用改善の成果として全手術件数は 5%増加し、ロボット手術件数は 21%増加した。これらの取り組みの結果、医業収支率は前年の 93.0%から 94.4%へと改善した。一方で、救急車搬送台数は前年から 3%減少しており、救急医療に関しては引き続き重要な課題として新たな対策を検討・実施している。

2-2-5　今後の進め方

(1) ビジョン 2028 及び重点課題

ビジョン 2028 を策定後、病院運営会議およびマネジメントレビューを通じて定期的に評価を行っている。これまでの実施状況や効果を踏まえ、重点課題については年度末のマネジメントレビュー結果を基に微修正を行い、2025 年度は基本方針と重点課題の関係をより明確化した内容としている。今後も、外部環境や医療需要の変化を踏まえながら、ビジョンの方向性は維持しつつ、重点課題や数値目標については柔軟に見直しを行い、実効性の高い方針管理を継続していく。

(2) 各部門における方針管理の高度化

各部門における方針管理については、これまでの取り組みにより、重点課題を意識した目標設定や進捗管理が定着しつつある。一方で、日常管理指標については、必ずしも医療の質や業務の成果を十分に反映していないものもあることから、今後は指標の妥当性や測定方法の見直しを進める。あわせて、方針管理指標の評価に新たに 4 スチューデントモデルを導入し、単なる結果評価にとどまらず、プロセスや仕組みの成熟度を含めた議論を TQM ヒアリングで深めていく。

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(3) 複数部門にまたがる方針管理の成熟

部門横断的な検討グループについては、これまで主として数値指標の改善を中心に評価してきたが、今後は活動プロセスや意思決定の仕組みそのものも評価対象とする。重点課題と検討グループとの対応関係をより明確にした上で、活動の標準化や他部門への横展開を進め、組織全体としての問題解決能力の向上につなげていく。また、検討グループの活動成果を病院運営会議およびマネジメントレビューに確実に反映させることで、方針管理サイクルのさらなる定着と高度化を図る。

3　TQM の導入と推進

3.1 概要（図 3-1）

「最善の医療を尽くして社会に貢献します。患者さんにやさしく働きがいのある病院を目指します」の基本理念のもと、年度ごとに病院目標を定めて、一貫して地域の医療および政策医療の拠点として、地域医療の充実や、先駆的医療の普及、向上に貢献してきた。

1999 年には日本医療評価機構による病院機能評価の認定を取得し、2003 年には QC サークル活動による質改善活動を開始した。この時期は、患者取り違え、薬剤の誤投与など、国内で重大な医療事故が頻発し、社会的にも医療の質・安全に対しての関心が高まっていた。当院でも安全な医療提供を目的として医療安全対策室を設置し、各部門で個別に質改善活動は行われていたが、全体最適の視点で統合されたマネジメントシステムとはなっておらず、活動の持続性・再現性に課題があった。

そこで、2007 年 5 月に当時の院長が「全員参加」を掲げ、ISO 9001 の認証を目標に、全病院での質改善を進める活動のキックオフを宣言した。ISO に関しては、2008 年 9 月に認証を取得した。これを契機に品質保証体系図を作成し、日常業務の可視化、標準化を推進した。

ISO の認証取得を目指すに当たり、医療安全上の課題となっていた投薬業務のプロセスフローチャート(PFC)を先行して作成し、順守状況を確認する目的で、初回内部監査を実施した。ISO 認証取得後は、TQM 推進室が中心となって、①方針管理による全部門での目標達成活動、(2)標準化、文書化を基盤とした日常管理、(3)内部監査を軸とした質改善活動、(4)人材育成を中心として、TQM 各要素の底上げを図ってきた（図 3-2)。2015 年には、医療安全管理室、TQM 推進室および感染対策室が協働し、効果的な TQM 活動を推進するため、総合品質管理推進部を立ち上げた。これによって、それぞれの部署が課題を持ち寄り、内部監査の監査項目を検討するなど、協力して医療の質改善に取り組む体制となっている。

2018 年には ISO 9001:2015 年版の認証を取得したことで、「組織の状況の理解」や「リスクおよび機会への取り組み」を意識した活動へと進化した。しかし、その後にはコロナ感染症の影響による受診控えにより患者数が減少し、2019 年の新病院建て替えによる減価償却費の負担など、病院を取り巻く環境は大きく変わってきた。これに対応するため、2023 年には従来の単年度計画から中長期ビジョンを掲げ基本方針・重点課題への設定へと方針管理体制を見直し、新たな TQM 活動に取り組んでいる（図 3-3)。

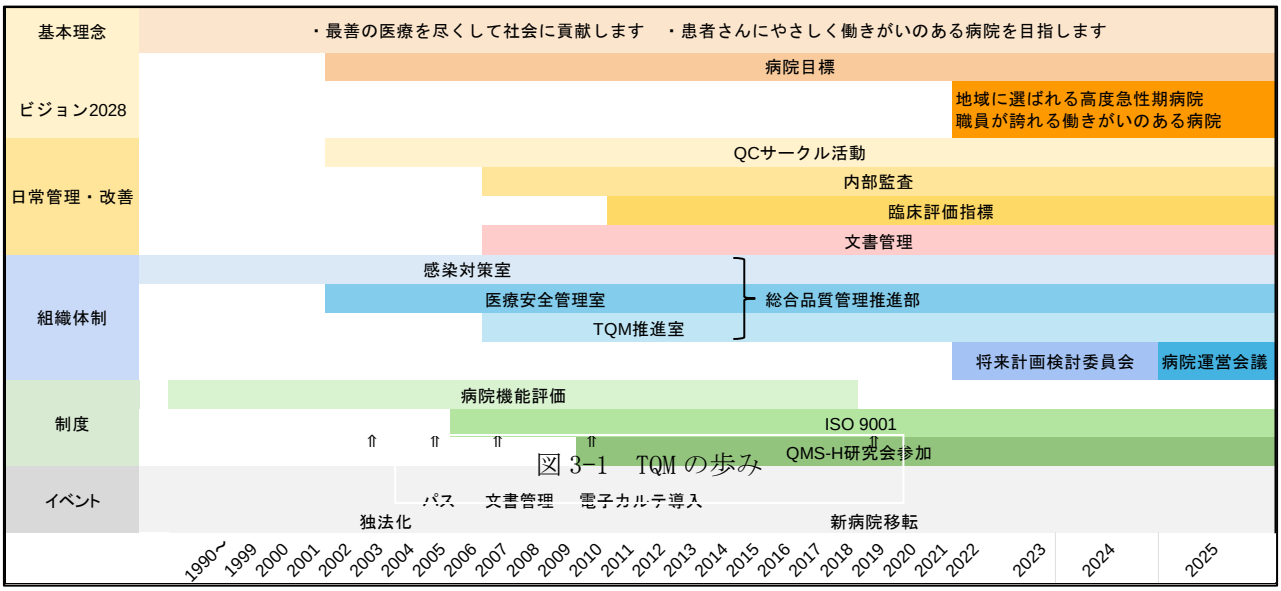


図 3-1　TQM の歩み

3.2 TQM 要素の活用

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(1) 方針管理

ISO 認証取得を契機に、当院では方針管理体系図を整備し、年度ごとに設定される病院目標のもと各部門・部署が目標シートを用いて年度目標および実施計画を策定している。活動結果は中間および年度末に確認され、ISO 管理責任者（副院長）がフィードバックを行う。また 6 月と 12 月に進捗ヒアリングを実施している。2013 年からは年度末に「重点活動報告会」を開催し、その結果をマネジメントレビューに反映している。さらに 2023 年には中長期ビジョン「ビジョン 2028」を策定し、基本方針・重点課題に基づく方針管理へと発展させた。各部門はこれを踏まえて目標を設定し、ヒアリングを通じて進捗と方向性を確認している。これにより、単なる成果評価にとどまらず、取り組みの質や継続的改善の観点からもマネジメントの精度向上を図っている。

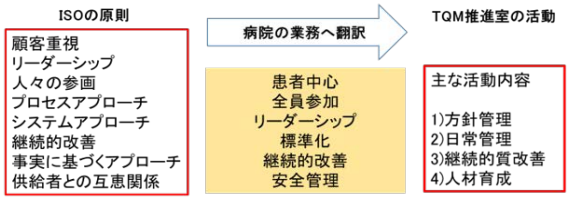


図 3-2 TQM 推進室の役割

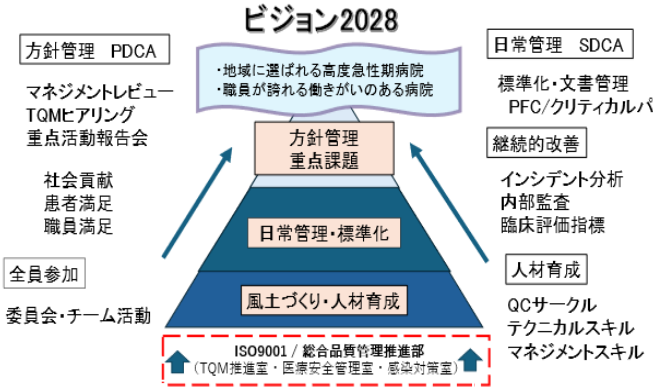


図 3-3 TQM 全体像

(2) 日常管理

ISO 導入以降、当院では文書管理規定を整備し、日常業務の標準化・可視化を進めてきた。現在では 288 件のプロセスフローチャートが作成・運用されており（図 3-4）、各部門での業務手順の明確化に寄与している。また、診療の標準化を目的としてクリティカルパスの導入を推進し、現在では全入院患者の 50%以上がクリティカルパスに基づく診療を受けている。入退院支援センターでは、患者の不安軽減と安心感の向上を目的に、入院時に患者用パスを用いて説明を行っている。2019 年の新病院移転以降は、文書管理システム「文太郎」を導入し、TQM 推進室が文書管理を担当している。文書は適用部署の範囲に応じて区分され、現在 746 件が登録されている。登録文書は各部署において年 1 回の見直しを義務付けており、内部監査では改訂履歴の確認をチェック項目としている。これにより、文書の現状と実際の運用との乖離を防ぎ、標準化の維持と継続的改善を確実なものとしている。

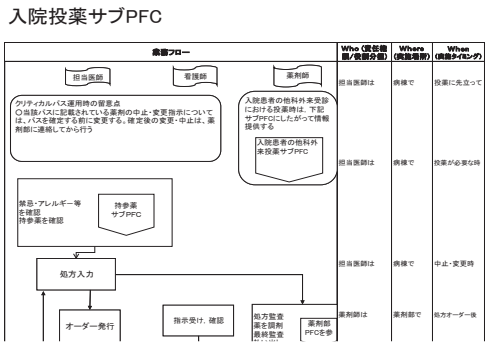


図 3-4 プロセスフローチャート

(3) 継続的改善

1) 医療安全管理

医療事故の発生要因には、多くの場合ヒューマンエラーが関与しており、ヒューマンエラーが起こり得ることを前提とした医療安全体制の構築が不可欠である。当院では、医療安全対策の基本となる、インシデント・アクシデント（IA）報告体制を整備し、IA レポート提出システム「CLIP」を運用している。報告された事例をもとに再発防止策を講じ、医療安全文化の定着と継続的な改善に努めている。

2) 内部監査

ISO 認証取得以降、当院では全ての部署を対象に重点課題を設定し、内部監査を実施している。監査の目的は、単に規格要求事項への適合を確認することにとどまらず、内部監査の特性である「対象への深い理解」と「情報収集力」を生かし、病院方針、診療内容、医療安全などの領域にまで踏み込んで改善を促すことにある。

3) 臨床評価指標

NHO では 2006 年より、医療の質を定量的に評価するための「臨床評価指標」を設定し、各病院での測定と活用を進めている。これにより、自院の経時的な改善状況や、NHO 病院群における相

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対的な位置づけを把握することが可能となっている。当院ではTQM推進室の調整のもと、年度毎に重点的に取り組む課題を選定し、関連部署が協働で活動計画を策定・実施している。診療科を含む多職種が参画し、PDCAサイクルを通じて診療の質向上に取り組んでいる。また、各部門が独自に指標を設定し、質改善に向けた自発的な取り組みも推進している。

(4) 人材育成

1) 教育体制の整備

当院のビジョンである「地域に選ばれる病院」「職員が誇りをもって働きがいのある病院」を実現するためには、人材育成が不可欠である。これまで部署単位で教育システムを構築してきたが、TQM導入を契機に病院全体での教育体制を整備した。その一環として、既存の教育体制を踏まえつつ「教育研修管理規定」および「教育体系図」を策定した。全職員を対象に、階層別教育を部門・部署単位で実施しており、年間教育研修計画は各部門が策定、TQM推進室が「職務要件表」に基づき職員ごとに進捗を管理している

2) QCサークル活動

TQM活動の一環として、全職員による改善活動を推進するため、2003年にQCサークル活動を開始した。この活動は上位方針に基づき、患者満足度の向上や医療の質の改善を図るとともに、職員のキャリア形成にも寄与している。2024年3月には「QCサークル活動綱領」を策定し、活動の目的や、管理者による「人材育成を通じた指導・支援」の方向性を明確化した。QCサークル活動を通じて培われる問題解決能力の向上は、当院における人材育成に大きく貢献している。

(5) 全員参加

ISO認証取得以来、当院では医師を含む全ての部門・階層による「全員参加型の活動」を重視してきた。しかし、当院はNHO北海道東北グループの一組織であり、毎年約30人の職場長が機構内で異動するため、TQM活動の維持と継承のためには、強力なリーダーシップに加えて、当院の実情に即した人材育成の仕組みが欠かせない。TQMの文化を組織風土として定着・醸成させることが、今後のTQM活動のさらなる発展につながると考えている。

3.3 選ばれ続ける高度急性期病院への総合品質経営

ビジョン2028は、「地域に選ばれ続ける高度急性期病院」と「職員が誇りを持ち、働きがいを実感できる病院」の実現である。その達成には、診療機能の強化のみならず、質を安定的に保証し続ける組織能力の体系的構築が不可欠である。

・地域に選ばれ続けるための地域医療連携能力
・断らない高度急性期医療を実現する応需マネジメント能力
・ロボット手術を核とした高度専門医療の臨床品質保証能力
・急変予防とリスク低減を推進する医療安全管理能力
・高度専門性と自律的改善文化を両立する人材育成能力
・内部監査を基軸として日常管理の定着と継続的改善を推進する管理能力

これらの能力を、これらをデータに基づいて管理し、臨床評価指標および安全関連指標により可視化するとともに、PDCAを循環させることで、質と安全の両立を実現している。

4 TQMの実施状況

4.1 地域に選ばれ続ける高度急性期医療を実現する地域連携体制の構築

4.1.1 概要

地域医療連携は、高度急性期病院である当院が、限られた医療資源を有効に活用し、地域全体として最適な医療提供体制を構築する上で、経営上極めて重要な課題である。地域の医療機関から信頼され、必要な患者を適切なタイミングで受け入れることは、「地域に選ばれる高度急性期病院」を実現するための基盤であり、患者確保の観点からも病院経営に直結する。当院は宮城県の救急医療および高度医療の中心的役割を担っているが、急性期病床数の過剰、COVID-19流行後の医療需要の回復遅延、病院新築に伴う借入金負担などにより、経営環境は厳しさを増している。このような状況下において、地域医療連携の強化は、特定の部門に委ねる業務ではなく、病院全体で取り組むべき経営課題であると位置付けている。その中で、地域医療連携室（構成スタッフは医師3人、看護師4人、医療ソーシャルワーカー7人、事務職員1人、電話応対委託事務員5～7人、医療連携委託事務員4人）は地域医療機関との窓

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口として重要な役割を担っているが、実際の連携の質は、紹介患者の受け入れに関わる診療科医師をはじめ、外来、病棟、検査部門、事務部門など全職員の対応によって決まる。当院では、地域医療連携室を中核としつつ、全職員が協力して、地域医療機関との信頼関係を深める体制づくりを進めてきた。こうした考え方の下、近年特に重点を置いて取り組んできたのが、新患紹介患者の予約方式の改善である。紹介元医療機関および患者双方の利便性を高めるとともに、診療科医師の協力を得ながら院内業務の効率化を図ることで、地域医療連携の実効性向上と患者確保につなげることを目指している。

4.1.2　活動の重点

＝課題・問題点＝

当院は、新患予約を原則FAXで行ってきた。これは東北大学病院の従来の新患予約システムと同様で、仙台市内400床以上の病院の過半数が採用している。一方、五大都市圏の機構病院や首都圏の大規模病院では、FAXに加えてLINEやインターネット予約も普及している。しかし、仙台市で10年以上前からインターネット予約を導入している病院を調査すると、全新患患者に占めるインターネット予約は約2割にとどまった。年配の開業医への聞き取りでも、FAXと紹介状による予約が依然として好まれていることが判明したため、当院は既存のFAX・紹介状による紹介システムを改善する方針とした。2023年12月時点の主な問題は以下の3点であった。

(1) 紹介患者の減少

COVID-19流行前は紹介患者数が年々増加していたが、流行中に救急診療を優先し通常診療を制限したため、新規紹介患者数が低迷した。また、地域の診療所・病院からのFAX紹介を断る頻度が2%を超えるまで増加した。2023年5月に診療制限を解除した後も紹介患者数は回復せず、同年10月には有効病床利用率が73%まで低下した。損益分岐点とされる88%を大きく下回り、重大な経営課題となった。

(2) FAX紹介患者断り数の増大

FAX紹介患者の断り率は1%弱と多くはないものの、電話応対委託事務員が受け入れ可否を相談する医師を探すのに時間を要していた。断りの70%は平均30分以内に再連絡できたが、30%は翌日以降となり、開業医が患者に当院受診を直ちに指示できない状況が生じ、医療連携上の障害となっていた。

(3) 問題解決の仕組みがない

患者が紹介されてから診察室に至るまで、電話応対、新患受付、外来受付、看護師など複数部署が関与していたが、指揮系統が異なり、地域医療連携室が問題を把握・解決する仕組みがなかった。また、電話応対委託事務員が医師や開業医との交渉上の問題を相談する場もなかった。

＝活動の重点＝

(1) 紹介患者の新規獲得

紹介患者数の目標を、1年後はキャッシュの安定化、3年後は経常収支黒字化、5年後は医業収支黒字化と設定した。2018年度の月平均紹介患者数1,410人をベースラインとし、1年後の目標を1,893人（34%増）とした。2023年度から医療連携委託業者と契約し、登録医を訪問して率直な意見を収集し、当院の問題点を把握する。改善後は副院長と内科部長または外科部長が再訪問し、改善内容を説明する。さらに3クール目の訪問で登録医の満足度を確認する。また、開業医のニーズを院内医師、特に若手医師に伝えるとともに、院内医師から開業医へのメッセージも収集して相互理解を促進する。加えて、FAXなしでも紹介状があれば即日新患受診できるシステムを導入する。

(2) FAX紹介患者断り数の低減

院長のリーダーシップの下、紹介患者を断らない方針を全医師に周知する。FAXによる受診決定までの時間を短縮するとともに、安定した外来患者の逆紹介を支援し、各診療科がFAX紹介を断る個別の理由についても調査・対応する。

(3) 問題解決の仕組み作り

電話応対委託事務員（前方さん）、副院長、看護師、医療ソーシャルワーカーによる「前方さんミーティング」を毎週開催し、問題点を共有して対策を立案し、週単位でPDCAを回す。また、病院運営会議等の方針と連動して、医療連携委託事務員、副院長、外科部長、看護師、医療ソーシャルワーカー、経営企画室長による連携室ミーティングを開催し、新たな施策を機動的に実施する。副院長が両者の情報を共有し、月単位でPDCAを回す体制とした。

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4.1.3　実施状況

(1) 紹介患者の新規獲得

院長が「新患申し込みの FAX 断りを 0 にする」「FAX なしでも紹介状持参であれば即日新患診療を行う」と全医師に周知し、仙台市内の全開業医へ葉書を送付するとともにホームページにも掲載した。FAX 断りの多い診療科については院長が個別に事情を聴取し、対策を協議した。登録医訪問は、従来の挨拶中心の方法から、以下の 3 段階に変更した。

1) 年間紹介数 100 件以上または 1 件以下を除く約 700 人の登録医を医療連携委託事務員が訪問し、率直な意見や当院への不満を収集。問題となった診療科・医師には改善を求めた。
2) 副院長と内科部長または外科部長が年間を通じて再訪問し、新方針や改善活動を説明。医師の不適切な対応や開業医の誤解による感情的な問題についても、謝罪や説明を行った。2024 年度の訪問数は 105 件であった。
3) 現在、医療連携委託事務員が 3 クール目の訪問を行い、改善活動後の登録医満足度をアンケートで確認している。また、1 クール目の訪問から不適切な電話応対業務が判明したため、前方さんミーティングで改善策を検討し、電話応対委託会社の上司にも参加を求めた。開業医からのクレームは診療科へ必ずフィードバックした。さらに、急患紹介時には副院長と外科部長がトリアージを行い、診療科を決定する体制を整えた。

(2) FAX 紹介患者断り数の低減

各科が FAX 紹介を断る理由を明らかにし、各科と問題解決策を協議した。FAX 内容を医師に確認する作業を中止した結果、受診決定までの時間を 10～15 分に短縮した。この改善をホームページ、ダイレクトメール、開業医訪問等で周知した。逆紹介を支援するため、登録医約 350 人の顔写真入りパンフレットを外来に掲示した。また、医療連携委託事務員が各診療科に開業医のニーズを伝える一方、診療科から開業医への要望も聞き取り、3 クール目の訪問で伝える取り組みを開始した。

(3) 問題解決の仕組み作り

毎週の前方さんミーティングで、その週に発生した問題や開業医からのクレームを週内に解決する体制とした。診療科別の紹介患者数を月単位でグラフ化し、幹部会議、連携室ミーティング、将来計画検討委員会に報告することで、月単位の PDCA を実施した。また、各部署から患者・開業医のクレームが直ちに連携室ミーティングへ報告される仕組みを整えた。

4.1.4　効果

(1) 紹介患者の新規獲得

月平均紹介患者数は 2023 年 10 月の改革開始後、徐々に増加したが、2024 年度目標の 1,893 人には未達であった（図 4-1-1）。一方開業医アンケートでは、当院に対するポジティブな意見の割合が増加した。

(2) FAX 紹介患者断り数の低減

2024 年の FAX 断り率は 0.3～0.5%程度まで低下した（図 4-1-1）。

(3) 問題解決の仕組み作り

前方さんミーティングにより、これまで発言の場がなかった電話応対委託事務員が自由に問題を提起できるようになり、新たな課題が明らかになった。また、連携室ミーティングでも新規企画が相次いで提案され、指揮系統の異なる各部署の問題点も把握・改善できるようになった。

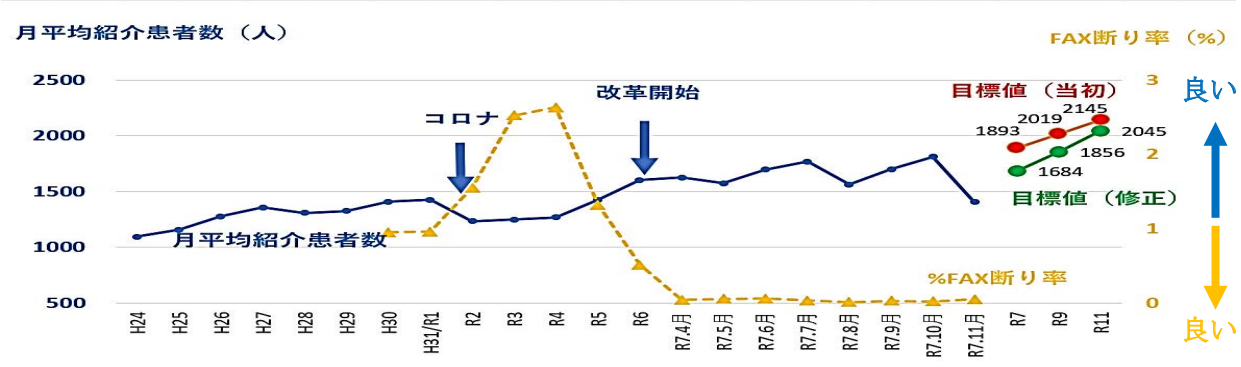


図 4-1-1 月平均紹介患者数と FAX 断り率

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4.1.5　今後の進め方

(1) 紹介患者数の増加

登録医以外の開業医に対する活動は、まだ行っていないので、計画した登録医訪問が終了した後に行う。活動後の紹介患者数の増減を個々の開業医別に分析し、再訪問先を考慮する参考にする。紹介状だけの新患患者は、全新患患者数の約 15%を占めるようになり、これをさらに伸ばしていく。開業医の年代も徐々に若年化してきており、インターネットでの予約の希望も散見されるようになった。今後、インターネットでの予約についても、対応を開始する予定である。

(2) FAX 紹介患者断り数の低減

FAX を断る個別の事情を見ると、東北大学との取り決めによって変えられない事項（例えば、骨腫瘍や顔面外傷は大学に紹介する等）、当院では診療できない分野（例、慢性維持透析、小児精神病、移植医療等）、医師の対応容量を超えるケース（例：多数の軽症患者）等の他に、専門性を必要としない疾患（誤嚥性肺炎、尿路感染等）も多い。このような疾患をスムーズに受け入れるためには総合診療科の整備が欠かせない。今後は、1 年に 1 人のペースで総合診療科の医師数を増やすことを目指している。

(3) 問題解決の仕組み作り

改革の速度が速いため、まだ地域医療連携室の規程やマニュアルの変更が追いついていない。順次、文書化も行っていく必要がある。

4.2　断らない高度急性期医療を実現する応需体制の強化

4.2.1　概要

当院は、ドクターヘリ運航基地を併設する救命救急センターを有し、宮城県・仙台医療圏の救急医療の中心的役割を担っている。救急医療は国が定める5疾病6事業の一つであり、当院では2025年度の重点課題として、救急車受け入れ台数の前年度比5%増および救急からの入院患者数増を掲げている。また、患者紹介数の増加や経営の安定化という観点からも救急医療は重要であり、質の高い救急医療の提供は、職員の誇りやキャリア形成にもつながる。

一方、仙台医療圏では救急車出動件数が年々増加し、救急車の活動時間の延長や収容困難事案の増加など、救急医療を取り巻く環境は厳しさを増している。特に、高齢化を背景として、複雑な病態を合併する患者や、軽症であっても自力で通院できない患者が増加しており、入院後も医療者の負担が大きく、担当医の過負荷につながりやすい。

このため、平日日勤帯に加え、夜間・休日の救急応需体制を強化する必要がある。しかし、NHOによる職員定数の厳格な管理により、看護師、診療看護師、救命救急士等の救急医療を担う職員を戦略的に増員することは困難である。こうした制約を踏まえつつ、地域住民が安心して救急医療を受けられる体制を維持・強化するため、限られた人員を有効活用し、増加する救急患者を受け入れる収容力を高めることが必要である

4.2.2　活動の重点

＝課題・問題点＝

(1) 毎日調査している救急車不応需理由の記録を分析した結果、不応需の最大の原因が「医師が少なく対応が困難」であり、それが不応需症例の原因の60%～70%を占めること、不応需例の50%～60%が内科救急症例であること、不応需が最も多い時間帯は休日日勤準夜帯であること、救急医が救急車に対応できる平日日勤帯の応需率は78%と最も高いことが判明した。救急科以外の各科の医師は平日日勤に外来や検査、手術などを行なっており、当直および入院患者に対する負担を増やすことは望ましくない。これらから救急医を増やし、効率的な救急対応が可能となる医師の人員配置を行う必要がある。

(2) 救急外来の診療ブースが満床になると、次の救急車を応需できなくなる。これを改善するために、入院の確定した患者が、救急外来に滞在する時間を最短にする必要がある。また救命救急センターが満床になると、次の救急応需ができなくなるため、早期から救命救急センター病床と後方病床（一般病床）の連携を強化し、救命救急センターの満床を回避する必要がある。上記2つの課題を改善することによって、年間救急車受け入れ件数を2020年の40%増として6000件、救急車応需率を2020年の20%増として75%を目標と設定した。

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(3) 上記対応によって応需率は改善してきたが、救急車受け入れ件数が増加してないことが分かった。応需率は改善しているが、救急収容患者数が減少していることから、当院への救急収容依頼数が減少していることになる。さらに救急収容患者数を増やすためには、別の不応需理由に対して対策していく必要がある。

＝活動の重点＝

(1) 救急医療体制（人員）の見直し
(2) 救急入院患者の救急外来待機時間の短縮
(3) さらなる不応需理由への対応の検討

4.2.3 実施状況

(1) 救急医療体制（人員）の見直し

毎月の病院運営会議傘下の救急応需検討Gにおいて、関連する全ての職種が議論し、以下の問題点を抽出し、その解決策を提案、実施してきた。

1) 救急医のリクルート：これまでは少数の救急医が平日日勤帯のみの救急車応需に対応しており、夜間休日は全科で行う日勤・夜勤医が対応していた。そこで救急医数を増やし、夜間・休日の救急車応需にも救急医が対応できることを目指すため、救急科専攻医プログラムを継続的に改善し、ホームページの改修、インスタグラムを用いたPR、様々な会合でのリクルート活動等を行った。この結果、救急医数は2022年度：4人、2023年度：8人、2024年度：12人、2025年度：13人と順調に増えた。これにより救急医が夜勤をカバーする日数を増加させた。具体的には、2022年度より救急医による平日遅番配置、2023年度より土日外科勤務のカバー、2024年度より平日ICU夜勤開始、土日の内科日勤への協力、平日夜勤の開始（火木）、2025年度より平日3日の夜勤増加（火水木）。将来的に24時間365日の外来勤務を目標にしているが、人員の充足を図りながら進める計画である。
2) 夜間休日の勤務医の効率的配置：内科系救急の休日日勤・準夜帯の医師数が少ないため、2024年10月から土日内科系に遅番（準夜帯）を新たに導入し、この時間帯だけ内科医を2人体制にした。しかし、この取り組みは内科専攻医が少なくなるということから、2025年3月で終了となった。
3) 救急外来の看護師不足：夜間は救急外来看護師が3人しかいないため、救急要請が立て込んだ場合には、患者対応が不可能となる。そこで救急外来看護師の負担軽減目的に、入院決定後に患者を救急センターまで搬送する救急外来看護師の業務を、救急センター看護師の業務に変更した。また、土日日勤帯の救急外来看護師の業務軽減のため、2024年8月より、一般外来看護師のうち平日日勤帯のみ業務を行っている看護師が、土日日勤帯の救急外来シフトに入るようにした。
(4) 救急外来看護師のタスクシフトとして、病院救命士の採用を増やすことを計画し、実際に2025年2月から2人目の病院救命士の採用が決定した。これにより、特に準夜帯での救急外来看護師の不足を補うことを検討している。

(2) 救急入院患者の救急外来待機時間の短縮

1) 毎月の病院運営会議傘下の、医師当直体制検討Gのもと、ベッドは病院全体のものであり、救急患者はどの病棟でも受け入れるという意識を、全ての看護師が持つべきであることを看護師長会で決定し、全看護師がこれを共有した。
2) 2024年8月から、平日夜間において、3つの病棟に夜間緊急入院ベッドを確保した。そこでは確実に日当直帯に、個室と心電図モニターなど物品を準備して新規の入院に備え、入院依頼があった際に救急外来に患者を停滞させることなく、すぐに入院できるようにした。
3) また、救命救急センターにおいては、夜間帯の緊急入院に備えるため、日勤帯に7床程度の空床を確保し、円滑な救急応需に備えた。
4) 2024年2月より救急応需に関係する情報（救命コール、救命救急センターを含む空床状況、手術場/血管撮影室の状況）を、当直医と看護師が同時に共有するために、iPhone一斉メールによる情報共有システムを開始した。
5) 救急外来におけるQC活動として、初療室の滞在時間を短縮する取り組みを行った。活動前は患

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者が救急センターへ移動するまでに135分かかっていたが、取り組みの結果、23分短縮することができた。

6）患者と地域の安心を守る体制の強化業務負担軽減、そして救急看護の質向上と人材育成を目的として、救急センターと救急外来のスタッフが互いの業務を理解し、柔軟に業務を行き来できるようにするトレーニングを2025年7月から実施している。また、2026年1月よりトレーニング終了した。スタッフを中心に、流動的に業務を行っている。

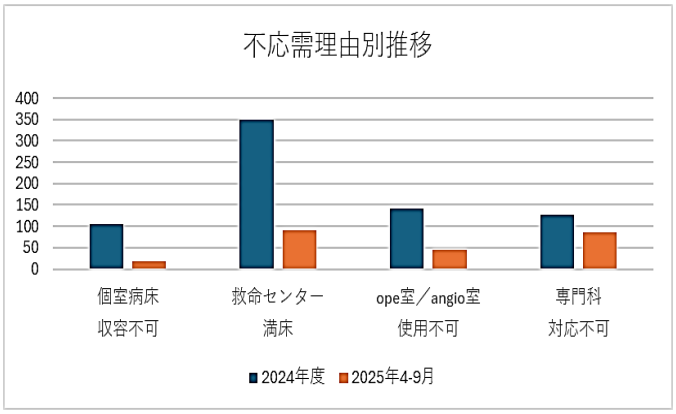


図　4-2-1 不応需理由別推移

(3) さらなる不応需理由への対応の検討

不応需理由の内訳の推移を検討（図4-2-1）したところ、「専門科対応不可」が一定数存在し、増加傾向にあることがわかった。診療科を跨ぐ対応が必要であり、今後の課題である。

4.2.4　効果

図 4-2-2 から、救命センター満床や個室満床による不応需は減少しているため、これまでの対策が奏功していることが窺える。応需率が 2025 年度になり目標を上回ったことからも、病床管理に関する対策の効果が得られていると考えられる（図 4-2-2）。しかし、救急車受け入れ件数は目標の 6,000 件に手が届く水準となったものの、2023 年度をピークに減少しており、収容依頼件数が増えていないことが推察される。

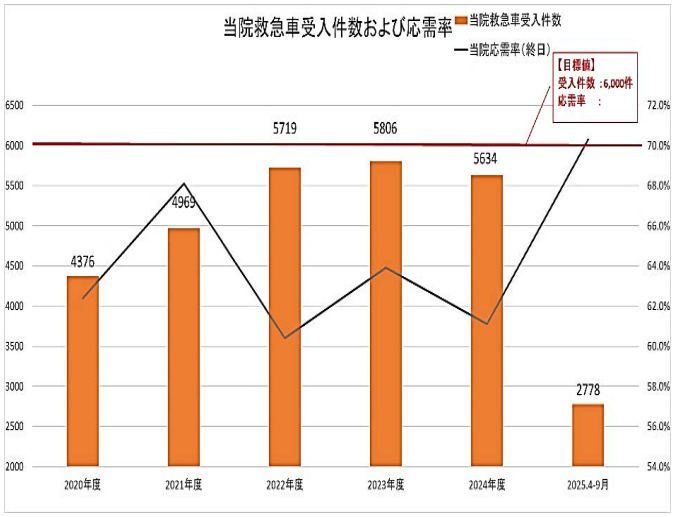


図　4-2-2 当院救急受入件数および応需率

全国および仙台市の救急搬送件数は、増加の一途をたどっていることがわかっているため、当院への収容依頼件数が増加していないことは周囲の医療事情に影響を受けていると推察される。つまり、近隣の 2 次医療機関による救急車応需が増えており、当院へは収容依頼が増えていないということである。救急応需に応えるためには、さらに応需率を上げていく必要がある。

4.2.5　今後の進め方

救急医の増加に継続して力をいれ、入院決定患者の収容を円滑にする取り組みを継続する。不応需の理由となる「専門科対応不可」に関して、次なる対策を検討していく。

4.3　ロボット手術を核とした高度専門医療の質保証体制の確立

4.3.1　概要

ロボット手術は手術侵襲の低減や早期退院につながり、患者満足度を高めるとともに医療の質向上に寄与する治療手段である。その結果、患者紹介件数の増加が期待され、地域に選ばれる高度急性期病院を目指す上で重要な戦略である。当院では 2013 年に手術支援ロボット（ダヴィンチ Si）を導入し、さらに 2024 年 1 月からは新機種の手術支援ロボット（ダヴィンチ Xi）を稼働させ、2 台体制での運用を開始している。

ロボット手術の実施には、新たな資格取得が必要な医師のみならず、準備や器械管理を担う看護師や臨床工学技士、複数診療科の医師など、多職種の連携が不可欠である。そのため、安全なロボットの導入および効率的な運用を、病院全体の課題として取り組んでいく必要がある。

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4.3.2　活動の重点

＝課題・問題点＝

(1) 複数診療科が同時期に新たな資格取得を要する高額医療器械を導入する際の、多職種共同管理体制の未整備。

(2) 高額である 2 台のロボットを効率的に稼働させ、十分な実績を上げる必要がある。

＝活動の重点＝

(1) 複数診療科、多職種連携 WG による安全な導入

(2) 新規治療導入の計画、進捗状況の把握、導入後の効果の評価、改善

4.3.3　実施状況

(1) 複数診療科、多職種連携 WG による安全な導入

地域に選ばれる高度急性期病院を目指すためには、最新の治療を安全に提供できる体制構築が重要である。ロボット手術は、従来の腹腔鏡手術以上に精緻な操作が可能となり、術中出血の減少、整容性の向上、一部疾患では予後改善も期待されるなど、患者にとって大きな利益が期待される。一方で、合併症発生時には重篤化のリスクもあるため、安全性の確保が不可欠である。

2023 年に泌尿器科医、産婦人科医、消化器外科医、呼吸器外科医、麻酔科医、看護師、臨床工学技士、事務部門による WG を結成し、新機種の導入への準備を行った。2 台目は新機種の手術支援ロボットの導入であったことから、あらためて各診療科の医師、手術室看護師、臨床工学技士が多職種で連携して、新たな資格取得、大型器械設置のための手術室内の物品の配置、緊急事態の対応を含めた運用のシミュレーションを行った。

2024 年 1 月に新機種による 1 例目の手術が無事に施行され、その後も緊急事態への対応のため、手術中にトラブルが発生した場合の緊急対応については、診療科や職種横断的に医師、手術室看護師、臨床工学技士参加でシミュレーションを定期的に行い、これまで安全に手術が行われている。

(2) 新規治療導入の計画、進捗状況の把握、導入後の効果の評価、改善

当院では 2013 年に 1 台目の旧機種の手術支援ロボット（ダヴィンチ Si）を導入したが、その時点では、主に 1 診療科での運用にとどまっていた。他院との差別化を図るためには、旧機種の手術支援ロボット 1 台のみの運用では難しいと判断し、東北地方においては大学病院以外では初の 2 台目導入を目指した。

2 台目導入のためには、ロボット手術数の経年的な増加の実績を示すことが必要であり、そのためにロボット手術を適用できる疾患、診療科を増加させてロボット手術数の経年的な増加の実績を示すことを、病院としての目標にした。

たとえば産婦人科では、これまで取り組んでこなかった骨盤臓器脱に対するロボット支援仙骨膣固定術を新たに導入すべく、症例の見学、他病院からの術者の招聘、病院負担での手術の施行を経て、無事新たな術式を開始できた。さらに周辺病院、住民への情報提供などを行った結果として、ロボット支援手術を経年的に増加させることができた。その結果、新機種の導入による 2 台体制が機構本部に認められ、2024 年 1 月に新機種による 1 例目を行うことができた。

さらに当院では、最新の治療を待ち時間なく安全に提供すること、また将来的には、現在関わっている 4 診療科以上の参入が見込まれることも考え、旧機種の新機種（ダヴィンチ Xi）　への更新が必要と考えた。

2 台のロボット稼働により、2 台目導入前の 1.5 倍の手術件数をこなすことで、継続的に 2 台体制を維持することの妥当性を示すことを目標とした。ロボット 2 台を効率よく稼働させるため、医師、看 護師、事務、臨床工学技士からなる多職種連携 WG を立ち上げ、各診療科の手術枠の調整のみならず、診療科横断的なロボット手術枠の管理することで、空き枠を最小限に抑えた効率的な運用体制を構築した。

4.3.4　効果

(1) 複数診療科、多職種連携 WG による安全な導入

2024 年 1 月には、手術中のトラブルや合併症もなく、新機種を導入することができた。2024 年 12 月の旧機種の新機種への更新までは、2 台の異なった手術支援ロボットの同時運用が必要であったが、大きな医療事故はなく、2 台を活用することができた。さらに、新機種への更新に当たっては、これ

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までの活動を生かし、使用する環境（手術室）での緊急時対応シミュレーションを、手術に関わる各科執刀医師、麻酔科、看護師、臨床工学技士が効率的に実施し、円滑な移行を実現した。

(2) 新規治療導入の計画、進捗状況の把握、 導入後の効果の評価、改善

図 4-3-1,2 に示した通り、2021 年度は 3 診療科で 14 術式、256 件、2022 年度は 4 診療科で 16 術式、315 件、2023 年度は 4 診療科で 21 術式、350 件、2024 年度は 4 診療科 23 術式の合計 426 件、2025 年度は 4 診療科 24 術式の見込み合計 447 件と増加傾向が認められている。症例数の増加に伴い、学会発表も 2018 年から 2022 年までは年に 8 報ほどであったが、2023 年以降は 12 報と増加し、高度専門医療としての質を証明した。



図 4-3-1　ロボット手術件数の年度推移

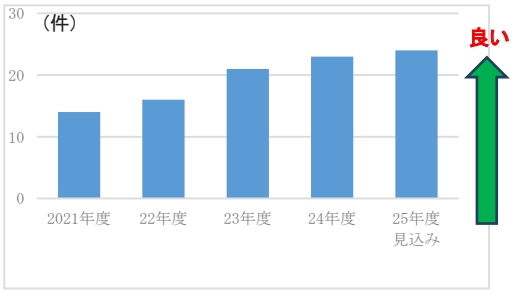


図 4-3-2 ロボット手術術式数の推移

新機種への更新による 2 台体制の維持を認めてもらうための目標である、ロボット手術件数を 1.5 倍にすることは、現状では達成できていないものの、導入前よりも約 1.3 倍に手術数を増加させることができた。そのことにより、2024 年 12 月には旧機種の新機種への更新が機構本部より認められ、12 月中旬より新機種 2 台体制での運用が開始された。

ロボット手術枠管理ファイルメーカーを効率よく活用し、1 日ロボット一台で一症例を実施した場合を 100%と計算した稼働率では、新機種導入前 83%だったものが、2025 年 9 月以降は 97%と、有効に活用されるようになった。

4.3.5　今後の進め方

地域に選ばれる病院となるためには、ロボット手術への積極的な取り組みは、高度な専門医療による患者さんへの利益につながることになり重要である。稼働率は安定してきており、今後は症例数を維持し、安全な治療を継続することが最も重要である。その上で、腹腔鏡手術と比較してロボットの優位性が証明され、診療報酬上の加点が見込まれる術式を積極的に導入することで、紹介患者の増加および病院経営へのさらなる貢献が期待される。

4.4　高度専門性と自律的改善文化を両立する人材育成体系の構築

4.4.1　職員の展望を見据えた人材育成体系の整備

4.4.1.1　概　要

TQM 活動における人材育成は、医療の質と安全性向上、健全で持続可能な病院経営の基盤であり、組織全体の成長を支える重要な取り組みである。当院は人材育成を通じて、全職員が使命を共通理解し、自ら考え主体的に行動できる職員の育成を目指している。

当院では教育研修管理者が全体方針の統一・標準化・整合性を確保し、各部門長が部門・職種別教育を主体的に企画・実施することで、現場に即した実効性の高い人材育成を行っている。

これらの整理を基に、職員自らが将来的な教育研修の展望を思い描くことができるよう「人材育成体系図」を作成した（表 4-4-1-1）。体系図では、縦軸に研修の場や研修の特性を、横軸に職員の階層や役職をラダー形式で示し、人材育成の全体像を可視化している。また、各々の研修毎に習得すべき分野や目的などを TQM 的視点から規定・記載している。さらに、医療法で義務付けられた必須研修、TQM 的要素に関する管理技術、固有の医療技術、両者の要素を併せ持つ混合技術に分類し、TQM 的意識改革の進展を段階的に示す構成とした。

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※1：必須研修を管理するコンテンツ．医療法で定められた年2回学習推奨の，感染，医療安全研修や，国立病院機構本部より指定された全職員研修の動画を配信している．
※2：継続的質改善の取り組みとして，院内で行われている委員会活動などの「医療の質向上に向けた取り組み」に関連した内容を伝達する研修会である．
※3：院内外より専門の講師を招聘して，業務終了後に行われる講演会である．がん診療連携や緩和ケアカンファランスなどの各種研修会，日本専門医機構専門医共通講習（医療安全，感染管理，倫理など）．
※4：救急・防犯・防災・災害訓練（年1回）など．
※5：TQM推進室が運営する全職員対象の教育研修動画を管理するコンテンツ．研修開催に際し，業務の都合や参加人数の制限等で直接参加することが困難な職員が，時間にとらわれずに研修会参加と同等に学べる環境を提供している．

表 4-4-1-1　人材育成体系図

4.4.2　臨床研修プログラム改善を通じた研修医の安定的確保

4.4.2.1　概要

医師は医師国家試験合格により医師免許を取得した後、2 年間の初期臨床研修の修了が義務付けられている。当院では、その教育の中核を臨床研修部が担い、体系的かつ実践的な研修体制を整備している。

4.4.2.2　活動の重点

＝課題・問題点＝

(1) 2010 年代には、初期臨床研修に応募する学生が少なく、定員割れすることもあった。臨床研修部が中心となって主として初期臨床研修医の教育を担い、医師としての土台を身に付けるための教育・研修を行っている。研修医は救急医療を支える存在として診療の現場で重要な役割を担っており、研修医が不足すると、研修体制のみならず救急医療の提供にも支障を来す。

＝活動の重点＝

(1) 研修プログラムへの応募者を増やす

これまで研修プログラムの質を担保するため、2 年に 1 回の卒後臨床研修評価機構の認証を受けるとともに、年 1～2 回の臨床研修管理委員会を開催し、年 4 回の臨床研修運営委員会を開催してきた。優秀な研修医を安定的に確保するためには、応募者数が多く、マッチング中間発表時点での第 1 希望指名者数が多いことが重要である。これまで応募者数は研修医定員 24 人の 1.5 倍を目標としてきたが、さらなる質の向上を目指し、臨床研修部独自の目標として、2028 年までの達成を見据え、2023 年より定員の 5 倍（120 人）の応募者数を新たに設定した。

4.4.2.3　実施状況

(1) 研修プログラムへの応募者を増やす

当院ではこれまでも臨床研修の充実に向けた多様な取り組みを継続してきた。2011 年以降、2 年ごとに卒後臨床研修評価機構の認証を受けるとともに、厚生労働省ガイドラインや病院戦略に基づき、プログラム内容や研修環境、評価体制、広報の在り方について継続的に見直し・改善を行ってきた。

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こうした基盤に加え、新たな目標達成に向けて、研修医ニーズを日常的な対話やヒアリング、アンケートにより継続的に把握し、電子メールや LINE を活用した迅速な情報共有と課題解決を可能とする体制を構築している。また、NHO 主催の指導医講習会を院内で定期開催し、指導医が参加しやすい環境を整えることで指導体制の質向上を図っている。プログラム面では必修診療科の見直しにより選択科の自由度を高めるとともに、研修開始後のローテート変更にも柔軟に対応し、個々のキャリア志向に即した研修を可能としている。

さらに、入職時オリエンテーションにおける法令・手技・態度教育、深夜看護研修、一次・二次救命蘇生研修、シミュレーターを用いた中心静脈カテーテル挿入などの手技研修を体系的に実施し、臨床現場への円滑な適応を支援している。救急外来における日当直研修では、診療科横断的な OJT として主体的な診療機会を確保し、当直翌朝の morning case conference で症例提示とフィードバックを行う教育体制を構築している。加えて当直体制の一本化により、上級医が研修医を指導する屋根瓦式教育を推進し、実践的診療能力の向上につなげている。

そのほか、エクセレント研修医賞・エクセレント指導医賞の表彰制度による意欲向上、病院説明会への出展や見学時の面談・昼食会、見学後アンケートの活用による広報体制の強化などにも取り組み、研修の魅力を多角的に情報発信している。

4.4.2.4　効果

(1) 研修プログラムへの応募者を増やす

様々な研修プログラムと研修システムの継続的な改善により、当院の研修プログラムへの応募者数とマッチング中間発表における第 1 希望指名者数が経時的に増大してきた。第 1 希望指名者数全国ランキングは、10 位前後を維持している。(図 4-4-2-1)。

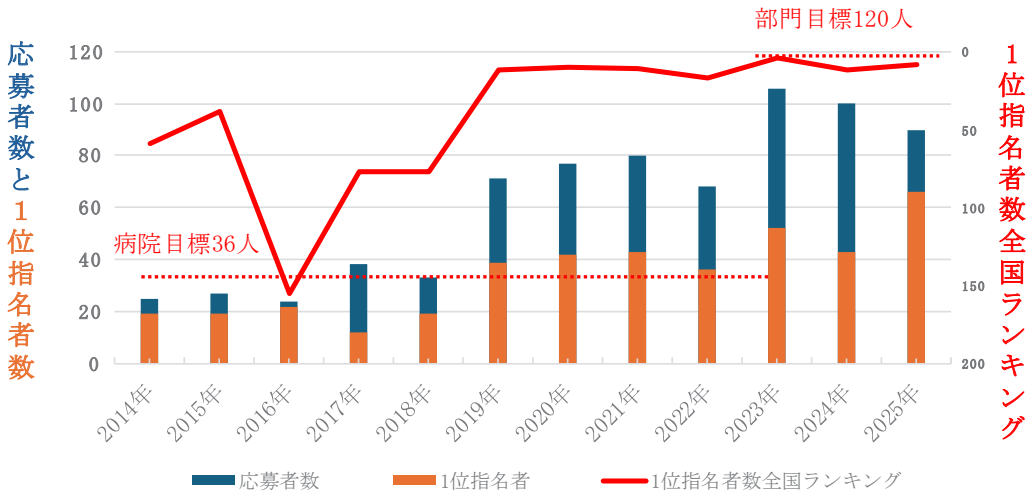


図 4-4-2-1　応募者数と 1 位指名者数/1 位指名者数全国ランキング

4.4.2.5　今後の進め方

(1) 臨床研修プログラムの継続的改善

当院は優れた研修医の育成を目指し、不断の改善活動に取り組んできた。

現在、厚生労働省による「臨床研修ガイドライン」の改訂作業も進められており、地域や時代のニーズを反映しつつ、指導医・研修医・学生の意見を取り入れながら、当院の臨床研修の魅力のさらなる向上を図っていく。

4.4.3 QC サークル活動の展開と継続的発展を支える推進基盤の整備

4.4.3.1　概要

当院では、TQM 活動の一環として全職員による改善活動を推進するため、2003 年 4 月に QC サークル活動推進委員会を設置し活動を開始した。QC サークル活動は、上位方針に基づき患者満足度の向上

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や医療の質改善に寄与するとともに、活動を通じた職員のキャリア形成にもつながっている。委員会は医師、看護師、コメディカル、事務職員など 22 人で構成されている。毎年約 25 チーム、140 人以上が参加し、全職種が一体となって改善活動に取り組んでいる（図 4-4-3-1）。

4.4.3.2　活動の重点

QC サークル活動を継続的に推進する仕組みがなかった

＝活動の重点＝

(1) 日本科学技術連盟「QC サークル推進者コース」への計画的派遣
(2) グループごとの指導力のバラつきの低減
(3) 「QC サークル活動綱領」の策定
(4) 全職員対象「QC 七つ道具体験型研修」の開催
(5) 職員研修計画一覧表を活用した QC サークル活動経験回数の把握
(6) QC サークル取組後の業務標準化の定着率向上

4.4.3.3　実施状況

(1) 日本科学技術連盟「QC サークル推進者コース」への計画的派遣

当院では、QC サークル推進者（推進者）の育成を目的として、毎年、選定した指導者 2 人を日本科学技術連盟「QC サークル推進者コース」へ派遣している。現在、委員会員のうち、医師 1 人と多職種 8 人が、QC サークル指導者（指導者）の役割を担っている。当院職員の多くは、北海道東北グループ内での人事異動が発生するため、推進者数を安定的に維持するには、計画的かつ継続的に推進者コースへ派遣し育成を続けることが重要である。現在、推進者のうち 1 人が QC サークル上級指導士、2 人が QC サークル指導士（指導士）資格を取得しており、専門的な知識に基づいた助言や支援を通じて、QC サークル活動を強力にサポートしている。（図 4-4-3-1）

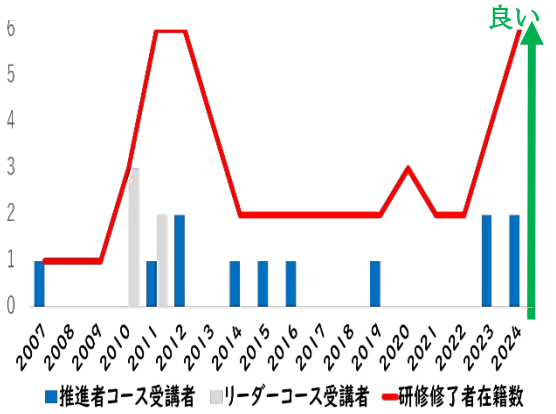


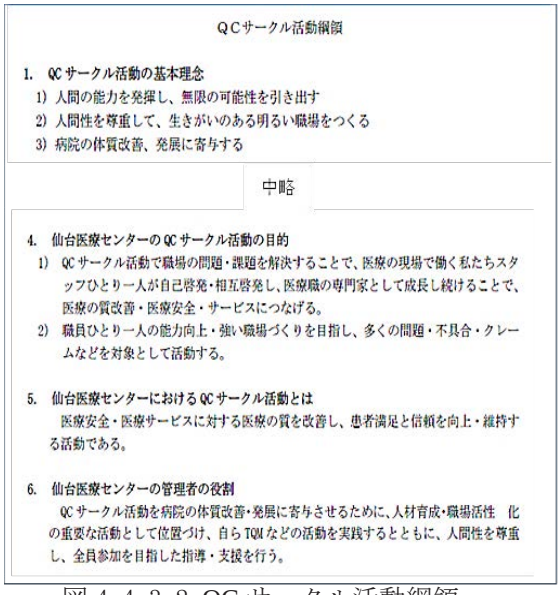
図 4-4-3-1 研修受講者数と在籍数の推移

(2) グループ間の指導力のバラつき低減

推進者コースへの派遣枠は、毎年 2 人に限られるため、全員が推進者資格を取得できているわけではない。そこで、1 グループ（約 6 サークル）の担当を決定する際には、推進者と非推進者をペアとし、グループ間で指導力の差が生じないよう工夫している。また、ペア間でサークルへのアドバイス内容を共有・調整することで、相互啓発によるスキル向上にもつなげている。

(3) 「QC サークル活動綱領」の策定

2024 年 3 月には、指導士を中心に「QC サークル活動綱領」（図 4-4-3-2）を策定した。綱領には、「仙台医療センターにおける QC サークル活動の目的」や、「管理者による人材育成を通した指導・支援」など、当院の QC サークル活動のあるべき姿を明確に示した。また、TQM 活動の理念に基づき、「管理者が全員参加を目指した指導、支援を行うこと」を明記した。4 月の第 1 回 QC サークル活動リーダーワーキングでは綱領の内容を紹介し、特に「QC サークル活動による人材育成」について重点的に説明したうえで、各サークルが活動を開始した。さらに、毎月のリーダーワーキングでは、指導者が 15 分間の講義で QC ストーリーごとのリーダーシップポイントを解説し、リーダーが現場で人材育成を意識しながら、全員参加で取り組めるよう支援を行っている。


QCサークル活動綱領

1. QCサークル活動の基本理念
   1) 人間の能力を発揮し、無限の可能性を引き出す
   2) 人間性を尊重して、生きがいのある明るい職場をつくる
   3) 病院の体質改善、発展に寄与する

中略

4. 仙台医療センターのQCサークル活動の目的
   1) QCサークル活動で職場の問題・課題を解決することで、医療の現場で働く私たちスタッフひとり一人が自己啓発・相互啓発し、医療職の専門家として成長し続けることで、医療の質改善・医療安全・サービスにつなげる。
   2) 職員ひとり一人の能力向上・強い職場づくりを目指し、多くの問題・不具合・クレームなどを対象として活動する。

5. 仙台医療センターにおけるQCサークル活動とは
   医療安全・医療サービスに対する医療の質を改善し、患者満足と信頼を向上・維持する活動である。

6. 仙台医療センターの管理者の役割
   QCサークル活動を病院の体質改善・発展に寄与させるために、人材育成・職場活性　化の重要な活動として位置づけ、自らTQMなどの活動を実践するとともに、人間性を尊重し、全員参加を目指した指導・支援を行う。

図 4-4-3-2 QC サークル活動綱領

(4) 全職員対象「QC 七つ道具体験型研修」の開催

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職員を対象とした教育として、サークルリーダーが集まるQCサークル活動ワーキング（年7回）に加え、勤務時間外に「全職員対象QCサークル活動研修会」を開催している。本研修では、QC七つ道具をグループワーク形式で体験できる内容を取り入れ、職員が楽しみながら改善の視点や実践力を身につけられるよう工夫している。テーマの選定は、上位方針に基づきつつ、現場の困りごとを改善できるよう、T型マトリックス図を体験してもらい、全ての部署がT型マトリックス図を使いこなすことができるよう進めた。これらの企画運営は、指導者全員で協力して行っており、職員の改善マインド向上に寄与している。

(5) 職員研修計画一覧表を活用したQCサークル活動経験回数の把握

これまでQCサークルの参加者は、職場長がスタッフへ口頭で経験回数や希望を確認し選定していたため、経験の偏りや未経験者の把握が難しい状況にあった。また、異動により新たに着任した職場長は、スタッフの活動経験を知る手段がなく、適切な指導や支援につながりにくいという課題もあった。さらにスタッフも、自身の経験を把握し、次の成長につなげることが難しいという問題があった。

表 4-4-3-1 看護部職員研修計画一覧表

部署名　○階○病棟

氏　名	看護師経験年数	部署経験年数	ラダー		役割		院内研修							院外		講師	看護研究	QC	学会
			R5年度	今年度	前年度	今年度	ラダー必須					その他研修 研修名を記載		研修名を記載					
							Ⅰ	Ⅱ	Ⅲ	Ⅳ	Ⅴ								
	15	3	Ⅴ維持	CREATE Ⅰ	副署統括長 QC係 感染安全 業務等	臨床指導(多) QC MACT 係 感染安全										○		4	
	21	6	Ⅳ維持	Ⅳ維持	サポートNS(多) 褥瘡	サポナ 褥瘡 5S						⑥	⑬、⑮	認知症ケア				③	

これらの課題を解消するため、看護部職員研修計画一覧表に、QCサークル参加回数とリーダー経験（○印）を記録する仕組みを導入した（表4-4-3-1）。この取り組みにより、管理者・スタッフ双方が活動経験を可視化できるようになり、計画的な人材育成の基盤が整った。

さらに2025年度からは、リハビリテーション科、放射線科も同様に研修計画表へ経験値を反映し、人材育成に活用している。（表4-4-3-2）

表 4-4-3-2 放射線科 QCサークル通算経験歴

No.	1	2	3	4	5	6	7	8	9	10	11
	A氏	B氏	C氏	D氏	E氏	F氏	G氏	H氏	I氏	J氏	K氏
サークル	4	9	3	2	8	7	5	4	4	4	3
リーダー	0	4	2	0	5	4	1	0	0	4	1

(6) QCサークル活動後の業務標準化の定着率向上

QCサークル活動を実施した部署に対しては、その翌年9月に、業務標準化の定着状況を詳細なアンケートで確認している。しかし、従来は毎年1件程度しか定着が確認できず、活動成果が継続的な業務改善へつながりにくい状況であった。そこで、2023年4月の第1回QCリーダーワーキングから、「継続的な業務標準化の定着を目指すこと」を繰り返し伝え、活動の中で意識して取り組むよう促した。その結果、2024年度は6件/26件（23%）で業務が定着していることを確認でき、改善効果の持続につながった（図4-4-3-3 ）。

また2024年度からは、内部監査においてQC活動による業務改善の定着状況を確認する際、要旨集を基に三現主義で確認するようTQM推進室から指定し、さらなる定着率向上に向けた取り組みを進めている。

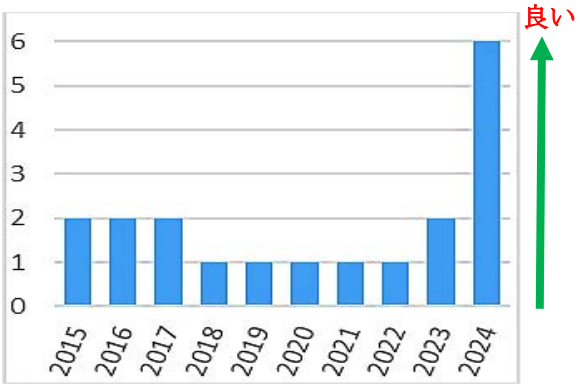


図 4-4-3-3 業務標準化件数

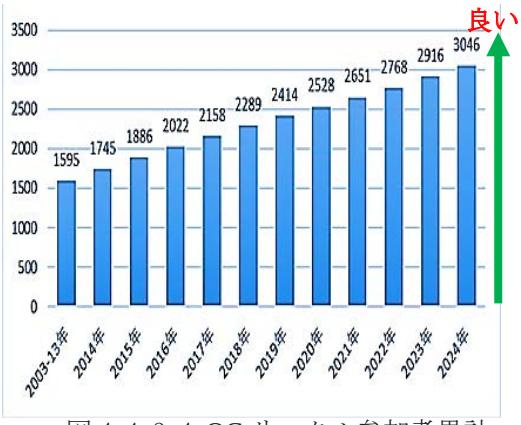


図 4-4-3-4 QCサークル参加者累計

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4.4.3.4　効果

これまで「QC サークル活動推進委員会規程」は存在していたが、新たに「QC サークル活動綱領」を策定したことで、全職員へ QC サークル活動の目的・方向性をより具体的に示すことができるようになった。これにより各部署では、職場長とスタッフの間で活動に対する共通理解が進み、「人材育成として QC サークル活動に取り組む」という視点が職場単位で共有される基盤が整った。看護部職員研修計画一覧の集計からは、2025 年 4 月時点で在籍する 559 人のうち、251 人（45%）の看護師が QC サークル活動を経験していることが明らかとなった。当院では、2003 年度から活動を継続しており、これまでに延べ 3,046 人が改善活動を通して、問題解決手法を学んでいる（図 4-4-3-4）。年間では毎年約 145 人が QC サークル活動に参加しているため、職員の経験状況を可視化する取り組みによって、管理者が計画的に育成機会を割り当てられる体制が整備された。さらに、指導者が、毎月活動綱領に基づく人材育成の視点を踏まえ、リーダー指導を継続したことで、リーダーのファシリテーション力が向上した。2024 年度に実施した「QC サークルリーダーチェックリスト」（表 4-4-3-3）では、リーダーがメンバーの意見を引き出し、対話を促す力を問う〈話し合いへの参加・参画〉カテゴリーで、4 月の平均 3.8 点（5 点中）が活動後の 2 月には 4.0 点となった。また、改善能力の向上を問う〈活動の PDCA〉では、4 月の平均 3.2 点に対し、2 月には 4.0 点と、高い自己評価が得られた。さらに、リーダーへの「取り組み後アンケート」では、「リーダーとして QC サークル活動を進めてきて良かったか」に、94%が「良かった」と回答した。良かった理由として、「リーダーシップが身についた」「病院の状況が分かるようになった」「判断力が身についた」などを複数人が選択し、改善活動を通した人材育成の効果を確認することができた。これらの取り組みにより、組織として継続的に QC サークル活動を推進する基盤が整い、職員の改善能力が高まったことで、リーダーが自信を得ることができた。その結果、業務標準化率向上、問題解決率向上（図 4-4-3-5）、全国大会入賞などの成果に繋がった。

表 4-4-3-3 QC サークルリーダーチェックリスト

	2024年度　QCサークルリーダーチェックリスト	4月	4月平均	2月	2月平均
話し合いへの参加・参画	定期的にQCの話し合いを実施していますか	4.0	3.8	4.1	4.0
	QCの話しあいをする際には、目的は明確になっていますか	4.2		4.1	
	QC活動を進めるにあたり役割を全員で分担して活動していますか	3.5		3.8	
	話し合いでは、メンバー全員の活発な発言がありますか	3.7		4.1	
	QCの話し合いをする際は、上司に出席をお願いしていますか？もしくは、内容の報告・連絡・相談を行っていますか	3.8		3.8	
PDCA活動の	QC的なものの見方・考え方を理解していますか	3.5	3.2	4.3	4.0
	「問題解決の手順」を理解し、手順に沿った活動を実践していますか	3.3		3.9	
	QCストーリーを理解し、活用していますか	3.3		4.1	
	スキルを向上させるため自己啓発・相互啓発を行っていますか	3.0		3.8	
	活動のPDCAを回し、活動を継続できていますか	3.0		3.8	

4.4.3.4　今後の進め方

今後は、QC サークルを通した人材育成を、さらに効果的かつ効率的に進めるため、毎年 4 月に QC サークル活動推進委員会メンバー、サークルリーダーへ「QC サークル活動綱領」を共有し、綱領の意図を踏まえた活動が各職場で継続できるよう、組織としての支援体制を整備していく。また、職員の QC サークル活動経験値については、QC サークル活動推進委員会が病院全体を把握する仕組みを構築し、経験の偏りを見える化することで、より計画的な人材育成へとつなげていく。これらの取り組みにより、QC サークル活動を軸とした人材育成の質向上と、組織全体の改善文化の定着を図っていく。

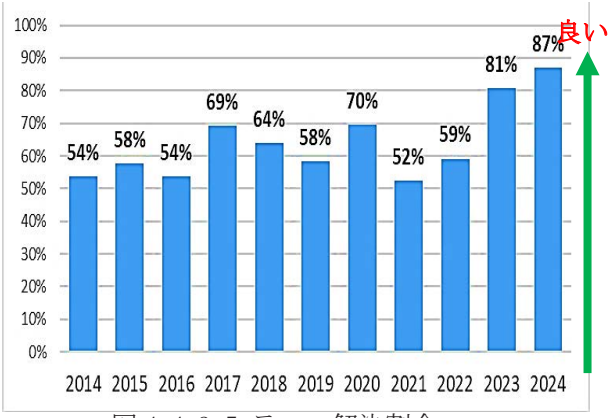


図 4-4-3-5 テーマ解決割合

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4.5　内部監査を基軸とした日常管理力向上の仕組み構築

4.5.1　概要

2008 年に ISO 9001 の認証を取得して以降、内部監査規程に従い定期的に内部監査を実施している。内部監査は、定められたルールへの適合状況を確認するとともに、日常業務に潜在する課題を明らかにし、医療の質向上に向けた改善活動につなげることを目的としている。監査計画は TQM 推進室が担当し、年度ごとに設定した重点テーマの他、部門目標の進捗管理、ルールが守られているか、継続的に改善されているか、教育が適切に行われているかといった多角的な視点から監査項目を設定している。特に診療記録の監査は、日々の記録に必要事項が記載されているかを確認することができ、適切な日常の診療の維持に欠かせない活動と位置付けている。2023 年は 64 部署を対象として、前期・後期に分けて内部監査を実施した。監査チームの構成は医師、看護師、コメディカルの 3 人としている。監査員の有資格者は 2023 年の時点で 168 人となっているが、毎年 20～30 人の監査員が NHO 内で異動するため、それを補うために監査員の養成が不可欠となる。有効な監査を維持していくために、既存監査員の教育強化に加えて、監査員養成研修を充実させ、新規監査員の質向上を図ることが重要な課題となる。

4.5.2　活動の重点

＝課題・問題点＝

(1) 効果的な内部監査を継続するための仕組みづくりが不十分であった。
(2) 外部審査、アンケートで、カルテ記載の不備および患者への説明の分かりやすさに課題があると指摘された。
(3) 内部監査がルール確認中心となり、改善効果を十分に引き出せていない可能性が懸念された。

＝活動の重点＝

(1) 効果的な内部監査の仕組みを構築する。
(2) 内部監査の仕組みを活用し、カルテの記載や患者への説明記録に関する監査の充実により、患者の理解を大切にした説明の徹底を図る。
(3) 内部監査を改善活動につなげる仕組みを強化する。

4.5.3　実施状況

(1) 効果的な内部監査の仕組みを構築する

内部監査開始当初は、処方・投薬など日常の業務の院内共通ルールが定まっていなかったため、病棟ごとに手順が異なることが、インシデントの原因となることも少なくなかった。そこで、医師、看護師、薬剤師を中心に、関連部署が集まって院内共通のプロセスフローチャート(PFC)を作成し、標準のルールを決めることから開始した。初回内部監査では、これに基づく業務実施状況を重点的に確認した。その後は、年度ごとに定めた重点項目に加えて、目標達成状況、継続的改善、人材育成の視点から、総合品質管理部（TQM 推進室と医療安全管理室・感染対策室）が課題を持ち寄ってチェックシートを作成している（表 4-5-1)。

表 4-5-1　各年度の内部監査重点項目とその推移

2014	入院投薬の手順が正しく行えているか確認する
2015/2016	身体抑制の指示　/　インシデント事例対応
2017/2018	目標の PDCA サイクルをどのように回しているか
2019	文書管理　　新病院への移転に伴い文書の適切な改訂が行われているか確認
2020～2024	丁寧な説明と同意考えられる医療について、十分な説明を行い、患者さんや家族の思いを尊重して同意の下、医療行為が実施されているか。
2025	日常管理の PDCA

内部監査の結果は、マネジメントレビューにおいて報告され、重点課題の見直しや資源配分の検討に活用されている。

(2) 内部監査の仕組みを活用し、カルテ監査の充実と、患者へ伝わる診療方針の説明の徹底を図る

1)　カルテ監査

医師を改善活動に参画させることを重視し、内部監査の中でカルテ監査を実施している。内部監査導入初期は、日々の確実な記載など、基本的な診療記録の有無を確認することから始めた。

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初期には、診療科ごとに記載率のばらつきが大きかったものの、適切なフィードバックによって，日々の記録は徐々に改善してきた。しかしながら、臨床研修病院の認定基準や入院診療加算の施設基準に必要な研修医指導内容記録の記載率など、改善が進まない項目も見られていた。内部監査によるカルテ監査の課題として、動機付けには有効であるものの、年一度の監査のため効果が一時的であること、サンプリング監査になるため、誤差も避けられないことが挙げられていた。

これらの課題を克服するため、情報管理室と連携し、診療録監査規程を見直し、電子カルテ画面から全入院症例のカルテをチェックし、データを提供するシステムを導入した。研修医指導記録は、電子カルテ内に、指導記録を残しやすくするためのテンプレートを作成し、全診療科の使用を義務付けた。結果は毎月の診療科科長会議で報告し、フィードバックしている。内部監査の弱点を補完することで監査の網羅性と客観性が向上し、改善サイクルを迅速に回すことが可能となった。看護部門でもインシデント対応、新人教育など一般事項に加えて、転倒転落事故防止の取り組みなどのテーマを設定し、診療録の記録に基づいた監査を実施している（表 4-5-2）。

表 4-5-2　カルテ監査チェックシート抜粋　医師部門

監査項目	確認方法	監査評価	評価
診断名・現在の病状についての説明	文書（同意書）、スキャナ履歴	A：診断名及び現在の病状の説明がある。 B：診断名、又は現在の病状の説明、どちらかがある。 C：上記　どちらもない。	**A，　B， C，　×**
セカンドオピニオンについて	文書（同意書）、スキャナ履歴 又は診療記録	説明・同意書にセカンドオピニオンについての説明がある。又は、一連の診療の中でセカンドオピニオンについての説明が診療記録から確認できる。（初回の治療方針決定の場面、外来の診察場面等）	**A：有， C：無， ×**
選択肢として考えられる他の治療法についての説明	文書（同意書）、スキャナ履歴	A：本治療以外の選択肢として考えられる他の治療方法及び、治療しない場合の病状の推移等の説明がある。 B：上記、どちらかの記載はある。C：上記、どちらもない。	**A，　B， C，　×**

2)　患者への説明記録の監査（重点項目　2020～）

患者満足アンケートの結果では、他院と比較して治療の内容、方針などの説明が分かりにくいとの評価が続いていた。これを受け、2020 年からは「丁寧な説明と同意」を内部監査重点項目に設定している（図 4-5-1）。

		Plan	Do	Check	Act
0期：現状把握・準備	2020	現状調査（TQM推進室）			指針・マニュアル作成
Ⅰ期：ルールの整備・監査開始	2021	文書登録・内部監査計画	IC文書見直し	同意書WG・内部監査実施	監査結果報告・看護部同席ルール設定
Ⅱ期：ルール順守状況の評価	2022	監査方法修正	内部監査実施		監査結果報告
	2023		内部監査実施	情報管理室予備調査実施	看護師同席ルール見直し・診療録監査規定改訂
Ⅲ期：効果確認	2024～	診療録監査要領登録	内部監査実施 患者アンケート	情報管理室監査実施	（監査方法修正）

図 4-5-1　丁寧な説明と同意　内部監査の PDCA

① 現状把握：2020 年に「侵襲を伴う医療行為」に対して、どのように説明・同意取得を行っているかについて調査したところ、診療科、医師ごとにばらつきが大きいことを把握した。

② ルールの整備：2021 年に TQM 推進室、医療安全管理室が中心となり「説明と同意に関する指針」、「説明同意書作成マニュアル」を策定し、文書の標準化、登録を義務付けた。

③ 遵守状況の評価、監査実施：指針、マニュアルをもとに内部監査を継続している。その後は、説明を行う医師に関するものだけではなく、重要な説明では看護師の関与をルール化し、同席の有無や、説明後の理解度確認なども監査項目に加えている。「説明記録のわかりやすさ」については、メディカルスタッフ、もしくは事務職の監査員が患者目線から、難解な言葉、略語が使用されていないかなどを確認し、多角的な視点からアプローチするよう心掛けている。患者への説明時に、看護師が同席する割合の目標値としては、緊急手術が約 20%である現状を踏まえ、80%とした。

④ 効果確認：これらの取り組みは、実際に患者にとっての満足度を上げることが究極の目的となる。このため、2024 年度には時期を定めて患者アンケートを行い、効果を判定することとした。

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(3) 監査を継続していくための工夫

内部監査の質を維持・向上するためには、内部監査員の力量強化が不可欠となる。監査員の要件としては、内部監査員養成研修の受講を義務化しており、2025 年 10 月現在 189 人（医師 52 人、看護師 75 人、メディカルスタッフ 45 人、事務部 17 人）の内部監査員が登録されている。しかし、毎年有資格者のうち 30 人程度が国立病院機構内で異動となるため、監査員の人数を維持するためには、新たに監査員を養成することが必要となる。このため、異動してきた医長、看護師長・副看護師長・主任には内部監員の資格の取得を促し、監査員を確保している。前後期合わせて約 50 部署（診療科・病棟同時監査を含む）で、3 人の監査員がチームとなって監査を実施していることから、150 人の監査員確保を目標数としている。研修を実施するにあたっては、主任監査員となる医師の参加は特に重要と考えて、異動のある 4 月初めには ISO 管理責任者が直接指名し、受講環境を整えている。内部監査養成研修の実施後には、監査員養成研修の改善目的で、アンケートを実施し改善に努めている。研修ではグループワークなどの実習を組み入れて工夫していたものの、実際の監査のイメージが掴みにくいとの意見も多かったことから、内部監査の実際を 15 分にまとめたビデオを作成し、研修に使用している。このビデオは、電子カルテ画面より随時閲覧できるようにしている。

4.5.4 効果

(1) 効果的な内部監査の仕組みを構築する

内部監査の指摘事項は、不適合、観察注意、改善課題の 3 段階で評価している。指摘数をみてみると、チェック項目によって、年度ごとにばらつきはみられるものの、最近では全体で不適合は 0～3 件、観察注意は 10～20 件、改善課題は 60～80 件程度、 1 部署で平均 1～2 件程度で推移している。テーマに沿った改善課題の指摘を、適切にフォローしていくことが改善に繋がっていると考えている（図 4-5-2）。

(2) 内部監査の仕組みを活用し、カルテ監査の充実により、患者へ伝わる説明の徹底を図る

カルテ監査開始以降、医師記載率、研修医記載承認率、指導医コメント記載率は徐々に上昇している。また、患者の理解を大切にした説明を目指して、計画的に内部監査を進めたことで、説明時に看護師が同席し、患者理解度を確認するルールが浸透してきている（図 4-5-3）。NHO で実施される患者満足度調査の結果でも、医師の説明および患者満足度の評価は近年上昇傾向を示している。

(3) 内部監査を継続していくための工夫

毎年内部監査員の有資格者の異動を補うために、計画的に対象者を選定して、養成研修を実施することで、目標となる 150 人の監査員数が維持され、医師の監査員も徐々に増えてきている（図 4-5-4）。

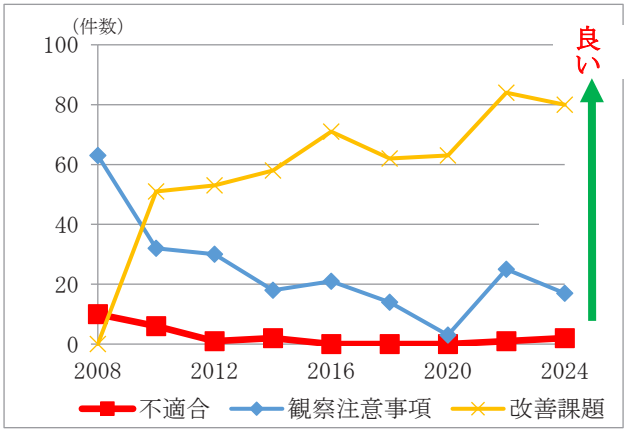


図 4-5-2　内部監査指摘数推移

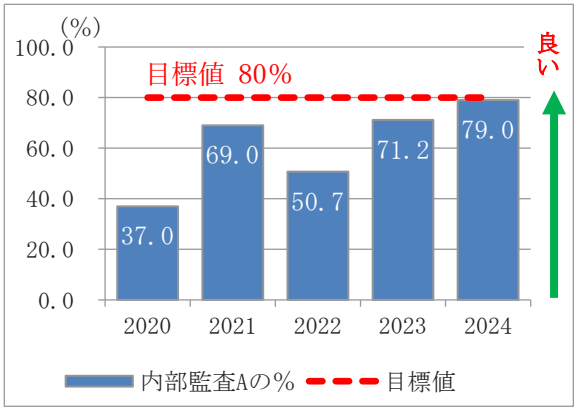


図 4-5-3　説明同意文書の同席者署名率

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4.5.5　今後の進め方

(1) 効果的な内部監査の仕組みを構築する

内部監査での指摘のフォローアップ体制を確立し、適切な改善策につなげ、PDCA を回していく。適切な課題を設定し、計画的に監査を進めるために、総合品質管理推進部として、TQM 推進室、医療安全対策室、感染対策室など質にかかわる部門が連携していく。

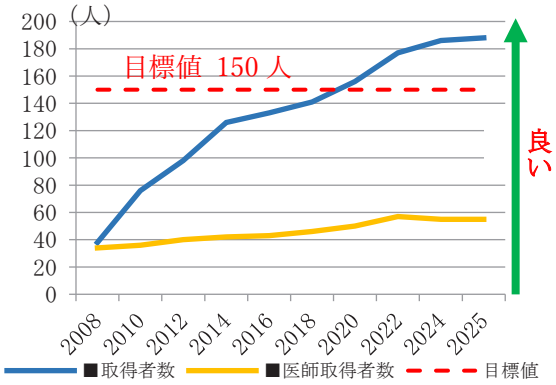


図 4-5-4 内部監査員数推移

(2) 内部監査の仕組みを活用し、カルテ監査の充実により、患者の理解を大切にした説明の徹底を図る

カルテ監査は、情報管理室と連携し、さらに監査の精度を高めていくことで、診療の質改善へ繋げていく。説明と同意についての取り組みは、患者満足へ繋がることが最終目標であり、患者満足度調査を継続し、効果の確認を行い評価していくことが必要と考えている。

(3) 内部監査を継続していくための工夫

監査員の力量向上は、有効な監査を継続する上で不可欠である。そのため、監査の成果や改善効果を可視化し、職員が監査の有効性を実感できるよう努めていく。これにより、内部監査を単なる点検活動にとどめるのではなく、自部署の業務を見直し、改善につなげる機会として活用していく。

4.6　臨床評価指標を基盤とした継続的改善型質保証の推進

4.6.1　概要

NHO は、2006 年度から医療の質を定量的に評価するための“ものさし”として、「臨床評価指標」の計測を開始した。開始当初はデータ収集を各病院が手作業で行っていたが、2010 年度から NHO 本部が傘下 140 病院の診療情報を収集するシステムを構築し、指標計測への運用を開始した。

当院では、2012 年度より、原則として各年度に 1 つの臨床評価指標を重点活動として取り上げ、業務改善活動を行っている（表 4-6-1）。その選定手順は以下のとおりである。まず、TQM 推進室が 110 項目の臨床評価指標を評価し、重症心身障害向けのものなどを除外したうえで、当院の診療内容に適合するか、当院として未達であるか、重点的に取り組む指標として適切かなどの観点から候補を絞り込む。次に、実施可能性等について担当部門と協議のうえ、対象指標を決定する。決定後は、TQM 推進室が中心となり、指定された部門および関連部署と定期的にミーティングを行い、目標達成に向けた活動計画を立案し、進捗状況を確認しながら、必要に応じて活動内容を追加している。結果は年度末の重点活動報告会で報告する。1 年間の活動で目標達成に至らなかった指標については、翌年度も継続して重点活動とするかどうかを TQM 推進室で検討し、マネジメントレビューへ報告したうえで、翌年度の重点活動につなげている。

表 4-6-1　当院で重点活動として取り上げた臨床評価指標

（年度）	
2020	がん患者周術期医科歯科連携実施率
2020-2021	広域スペクトル抗菌薬使用時の細菌培養実施率
2022-2023	安全管理が必要な医薬品に対する服薬指導の実施率
2024	脳卒中患者の地域連携パス使用率
2025	75歳以上の患者に対するベンゾジアゼピン系睡眠薬の不使用率

4.6.2　活動の重点

＝課題・問題点＝

(1) 患者が薬物療法の安全性や有用性を理解するうえで、服薬指導は重要である。特に、安全管理が必要な医薬品（ハイリスク薬）では、その意義が大きい。しかし、ハイリスク薬に重点を置いた服薬指導がどの程度実施されているかは明らかでなかった。

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(2) 脳卒中患者は急性期の治療終了後速やかに連携病院に転院させ、リハビリ等を継続すべきだが、それを効率的に行うための地域連携パスの利用率が低かった。

＝活動の重点＝

NHO 臨床評価指標の現状把握と改善を介して、当院の医療の質の改善を目指す。

(1) 薬剤部による「ハイリスク薬に対する服薬指導実施率」(2022 年度、2023 年度)

(2) 地域連携室による「脳卒中に対する地域連携パス使用率」(2024 年度)

4.6.3 実施状況

(1) ハイリスク薬に対する服薬指導実施率（目標：50%以上）

2022 年度の重点課題として、「ハイリスク薬に対する服薬指導実施率」が選定された。取り組み開始時の実施率は 43.8%であり、NHO 目標値である 50%以上に達していなかった。当院ではハイリスク薬の服薬指導件数を独自の管理指標とし、2022 年度は平均 620 件/月以上、全体 の服薬指導実施件数は平均 1,050 件/月以上を目標とした。その結果、2022 年度のハイリスク薬に対する服薬指導実施率は 47.7%で、NHO 目標値には到達しなかったため、2023 年度も継続して取り組む方針とした。これに伴い、2023 年度はハイリスク薬の服薬指導件数目標値を平均 700 件/月以上、全体の服薬指導実施件数の目標値を平均 1,100 件/月以上と、さらに高い値に設定した。

服薬指導業務には 18～20 人の薬剤師が関わっている（16 病棟に各 1～2 人を配置し、それを 3 チームに分け、それぞれにリーダー1 人を配置)。2022 年 4 月には、活動の重点を明確にするため、薬剤部内でアンケート調査を行った。その結果、ハイリスク薬使用患者への服薬指導を優先する意識が十分でないこと、どの薬剤がハイリスク薬であるかをリアルタイムに把握するツールがないこと、同一病棟担当チームの薬剤師がともに不在となり対応できない場合があることなど、病棟薬剤師の服薬指導に対する意識とシステムの両面に課題があることが判明した。これらの問題を改善するため、以下の活動を行った。

1) 薬剤部リーダー会議（月 1 回）において、ハイリスク薬使用患者への優先的な服薬指導実施を周知し、実施状況の把握・確認を行った。
2) ハイリスク薬使用患者をリアルタイムで把握できるシステムを構築し、運用を開始した（情報管理室と協働)。また、ハイリスク薬一覧を作成し、リーダー会議で情報共有を行った。
3) 同一チーム内で休暇が重ならないよう勤務調整を行った。
4) 6 か月目に中間評価、12 か月目に最終評価を実施した。

(2) 脳卒中患者に対する地域連携パス使用率（目標：50%以上）

脳卒中患者は、急性期病院での治療後、早期に転院し、連携病院で継続的にリハビリテーションや抗血小板薬・抗凝固薬内服、糖尿病や血圧の管理などを受けることが必要である。みやぎ医療福祉情報ネットワーク（MMWIN）を用いた地域連携パスを活用することによって、これらを効率的に進めることができる。しかし、当初は MMWIN の仕組みや活用方法が十分に理解されておらず、地域連携パスの利用率も低かった。この課題を改善するため、以下の活動を行った。

1) 対象病棟の看護師長および全退院調整看護師に対する説明会を実施した。
2) 連携病院への紹介に関する患者・家族向け資料を作成した。
3) 医師およびリハビリテーション科へ協力を依頼した。
4) MMWIN 連携会議に参加した。
5) 連携外病院に対して MMWIN の使用を推奨した。

4.6.4 効果

(1) ハイリスク薬に対する服薬指導実施率

図 4-6-1 に実施率の推移を示す。2014 年度に 18.8%であった実施率が、2016 年度に 44-6%へ急上昇したのは、診療報酬改定により病棟薬剤師の増員・配置が行われた結果である。その後、実施率は 40%台半ばで推移していたが、重点活動の取り組み開始後、2 年目の 2023 年度には 54.7%まで上昇し、目標値である 50%に到達した。また、2023 年度のハイリスク薬の薬剤管理指導実施件数は平均 799 件/月、全服薬指導件数は平均 1,231 件/月であり、いずれも目標に到達した。

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(2) 脳卒中患者に対する地域連携パス使用率

図 4-6-2 に実施率の推移を示す。2023 年度に 33%であった実施率が、2024 年度 55%に上昇した。全病棟看護師長、退院調整看護師、リハビリスタッフ、医師らが連携・協力したことで様々な職種から患者・家族へ連携病院の転院推奨を行うことができた。説明用紙の見直しを行い、それを目につきやすい場所に掲示したことで、連携病院への転院希望が増加した。また MMWIN との協働により、連携対象病院が増えたこともパス使用率の上昇につながった。

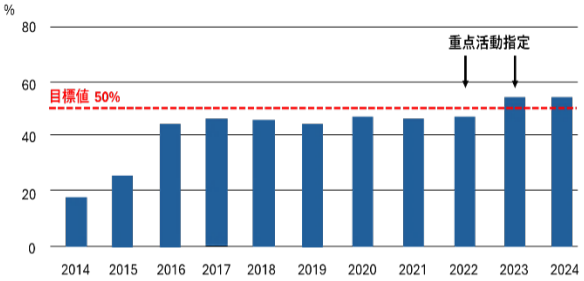


図 4-6-1　ハイリスク薬服薬指導実施

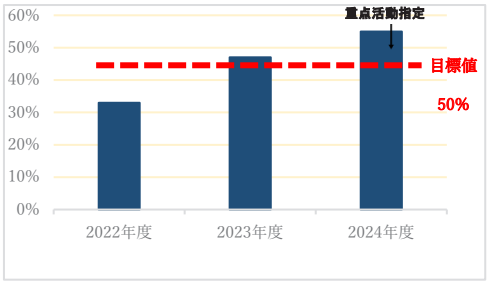


図 4-6-2 地域連携パス使用率推移

4.6.5　今後の進め方と今年度の新しい取り組み等について

今回提示した臨床評価指標では、いずれも改善活動の取り組み開始後に項目の実施率が上昇した。院内おける重点課題としての臨床評価指標の指定と計画・実行は有効な改善をもたらすことが実証されたと言える。

5　総合効果

当院は、2028 年ビジョンとして「地域に選ばれる高度急性期病院」、「職員が誇れる働きがいのある病院」を掲げ、これらを同時に実現する手段として TQM を当院全体の取り組みとして展開してきた。
本章では総括編 2-2 図 2-1「ビジョンー基本方針ー重点課題ー病院運営会議対応図」で示した経営方針及び重点課題に対し、これまでの TQM 活動がどの程度効果を上げたかについて、重点課題に対応する成果が出た指標を中心に総合的に評価する。

5.1　効果①　地域に選ばれる高度急性期病院としての効果

5.1.1　外部顧客からの評価（患者・地域医療機関）

重点課題 2025 のうち、「地域との医療連携と情報共有」および「社会のニーズに対応した病院経営」に対応する成果として、紹介患者数および救急車応需体制の改善が確認されている。
紹介患者数は年々増加しており、一時顧客である患者のみならず、二次顧客である地域医療機関からも選ばれるすなわち地域から選ばれる病院としての一定の成果が確認されている（図 5-1）。仙台市内における高度急性期医療需要が概ね横ばいである中、当院の紹介患者数が増加していることは、地域内における相対的な選好の結果と捉えている。救急車応需についても、救急科の人員確保、休日担当医の補強、救急外来および病棟の体制を見直すことで、応需台数は目標値 6,000 台に向けて着実に改善している（図 5-2）。これらは、顧客の声と事実に基づく改善が、選ばれる病院づくりにつながった結果である。

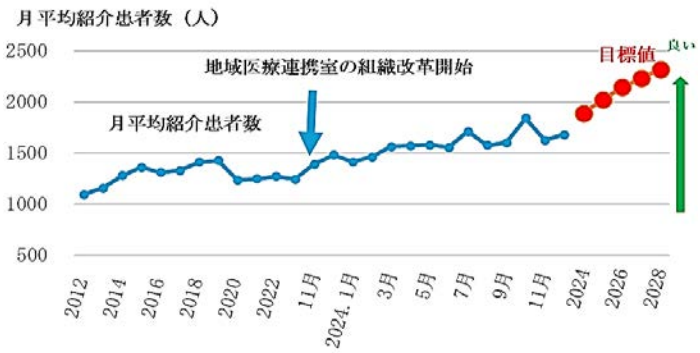


図 5-1　月間平均紹介患者数



図 5-2　救急受け入れ件数および応需

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5.1.2　新たな価値創造による差別化

ロボット手術は、地域における高度急性期医療の質を高めると同時に、当院の新たな価値創造の柱となっている。安全性を最優先とした多職種連携による導入・運用体制を構築した結果、2024 年度からはロボット 2 台体制となり、対象診療科・術式・手術件数はいずれも順調に拡大している（図 5-3）。
この取り組みは、高度医療と安全管理を両立させる TQM の考え方が、戦略的投資の成功要因となった一例と考えられる。

5.1.3 経営の安定化と質向上の両立

医業収支率は、2023 年 10 月に将来計画検討委員会を設置して以降、目標値 100%に向けて緩やかな改善トレンドを示している（図 5-4）。2028 年に医業収支が黒字となるための月平均紹介患者数 2,320 人を目標とし、改善活動を継続してきたが、当初設定した数値目標が現実的でない可能性を事実から認識し、前年比 5%増という達成可能性と挑戦性を両立させた目標へ修正したことは、数値目標を固定化せず、学習に基づき進化させる方針管理の成果である。
また、適正抗菌薬使用、ハイリスク薬剤への服薬指導、脳卒中に対する地域連携パス使用率といった臨床評価指標では、多職種が PDCA を回す仕組みが定着し、達成率は着実に向上している（図 5-6、5-7）。これらは、医療の質向上と経営安定がトレードオフではなく、相互に強化される関係であることを示している。

5.2　効果②　職員が誇れる働きがいのある病院づくりとしての効果

（重点課題 2025：3 質の高い医療従事者の育成、4 職員の働く環境の改善）

5.2.1 内部顧客からの評価（医師・看護師）

COVID-19 流行後に課題となった新人看護師離職率に対し、方針管理の下で多面的な対策を実施した結果、2024 年度は、6.6%という低水準を達成している。これは、人材定着を重要な品質課題と位置づけ、継続的に改善した成果である。また、臨床研修医教育においても、研修プログラムの継続的改善と指導体制強化により、マッチングにおける第一志望者数は増加し、全国ランキングでも 10 位前後を安定して維持している。これらの結果は、当院が医師・看護師双方から選ばれる働きがいのある病院として評価されていることを示している。

5.2.2 組織能力向上とマネジメント成熟度の向上

医療の質改善は病院価値と患者満足度を高める要素であるとともに、職員の誇りでもある。質を改善するための内部監査は、医師・看護師・メディカルスタッフ・事務職員による混成チームで病院全部門の取り組みとして実施している。TQM 推進室が中心となり、監査プログラム（監査項目の設定、監査計画）を確立したことで、課題の早期発見と迅速な改善が可能となった。一方で、職員の定期異動が多いため、内部監査員の数と力量を維持する、人材育成のための様々な仕組みを維持することにも力を入れている。内部監査は単なるチェック機能に留まらず、マネジメント能力向上の OJT、PDCA 思考の定着、部門横断的視点の育成として機能しており、組織全体の改善力向上に寄与している。

5.3　無形効果

TQM 導入により、従来の上意下達的な組織文化から、職員一人ひとりが現状を考え、改善を提案・実行する文化へと変化しつつある。品質向上、経営安定、組織連携が相互に関連しているという認識が、医師を含む職員全体に浸透してきた。当院では、北海道・東北地方の 20 のグループ病院間で定期的な人材異動が行われているが、TQM の考え方を身につけた職員が異動先で方針管理と改善活動を実践することで、グループ全体の医療の質と経営基盤の底上げに貢献している。また、改善力のある人材と評価を受ければキャリアアップにつながり、グループ病院の組織と職員の良い循環が生まれる。この人材循環は、TQM の無形効果として極めて重要な成果である。

6　将来計画

当院の経営における課題・問題点と対処状況については、2-2 経営方針とその展開で示した。前項の総合効果では、重点課題に対応する指標を中心に TQM 活動の成果を評価し、医療の質向上、業務改善、

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経営面の改善に一定の効果が認められた。これは、2-2-2 で示した課題・問題点に対し、方針に基づく改善活動が適切に機能した結果と考えられる。これらの取り組みは主として年度単位・短期的視点での改善において有効であったものの、外部環境の変化に対応した中長期的な経営基盤の強化という観点では、なお課題が残されている。

また、当院を取り巻く外部環境は依然として厳しく、仙台医療圏においては高度急性期医療需要が限定的である一方、病床数は相対的に多く、同規模・同機能の医療機関も存在している。このような状況においては、従来の改善活動の継続に加え、当院の強みを踏まえた組織能力の強化と方針管理の充実が必要である。このため、当院の TQM 活動における課題を整理し、それを強化・修正することで、中長期的に持続可能な経営基盤の確立を目指す。

(1) 中長期的視点を重視した方針管理

これまでの TQM 活動は、年度ごとの目標管理と日常業務の標準化、改善活動を中心に展開してきた。これらは短期的な改善には有効であったが、中長期的視点の方針管理は十分とは言えなかった。このため現在は、日常管理と方針管理の両立を図りつつ、方針管理のさらなる強化を進めている。その第一段階としてビジョン 2028 を策定しており、本年度はその中間年にあたる。今後は、ビジョンの達成度を指標に基づき評価し、その結果を後半期間の方針へ反映させるとともに、基本方針・重点課題・部門方針の整合性をより明確にしていく。

また、方針管理の浸透状況は、経営ヒアリングや、マネジメントレビューを通じて確認し、方針管理を単なる目標設定にとどめず、経営と現場活動を結びつける仕組みとして定着させていく。

(2) 検討グループ・委員会による部門横断的な課題解決

当院では、2024 年に将来計画検討委員会を再開し、2025 年には病院運営会議へ改組、基本方針・重点課題に紐づく検討グループを設置し、主として数値指標の改善に取り組んできた。しかし、方針との連動や活動プロセスの検討については必ずしも十分ではなかった。これらの活動は方針展開図として整理されている。今後は、数値改善に加え、活動プロセスや意思決定の仕組みも検討対象とし、重点課題と検討グループの対応関係をより明確にする。さらに、活動の標準化や他部門への横展開を進めることで組織全体としての問題解決能力の向上につなげていく（図 6-1）。

また、検討グループの活動成果を病院運営会議およびマネジメントレビューに確実に反映し、方針管理サイクルの中で継続的改善を図る。例えば、2025 年度のレビューで指摘された外来待ち時間の課題は、2026 年度の重点課題として設定し、部門横断での改善を進めている。既存の各種委員会についても、従来は日常管理を担う組織としての位置づけが強かったが、今後は方針管理の一翼を担う主体としての役割を明確にする。そのため、報告中心の運営から討議・意思決定を重視した運営への転換を図り、専門性の高い職員の主体的関与を促進していく。

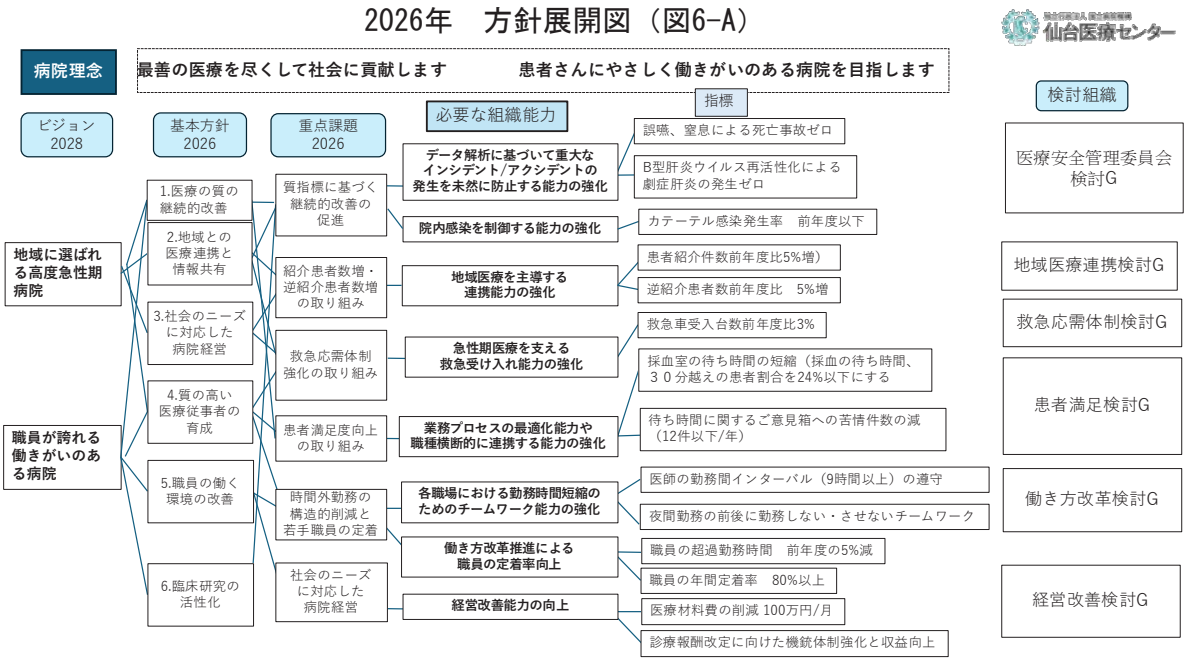


図 6-1 方針展開図(2026)

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(3) 安定的な人材育成と地域医療構想における役割

これらの方針管理の強化および部門横断的な課題解決を持続的に推進していくためには、それを支える人材基盤の整備が不可欠である。当院では、医師は大学人事により短期間で異動することが多く、その他職種についても北海道東北グループでの採用により転勤が前提となっている。このため、一定期間で人材が入れ替わる構造を有している。また、離職率には職種間で差があり、帰属意識やキャリア形成のあり方が影響していると考えられる。このような状況においては、個人に依存した体制ではなく、組織として知識・技術・改善活動を継承できる仕組みの構築が重要である。このような人材の流動性を踏まえ、NHO あるいは NHO 北海道東北グループに所属する利点を強調できるような仕組みが必要である。当院では、これまで、QC サークル活動、内部監査、教育体系の整備を通じて人材育成を進めてきたが、今後は、これらをさらに体系化し、標準化・文書化を通じて再現性の高い業務運営を確立する。

また、地域医療構想では、急性期拠点病院の選定が進む見込みであり、当院もその役割を担うことを目指す。一方で、近隣医療機関との機能分担や競争環境の変化も想定されるため、地域医療連携、応需体制、専門医療機能の強化を進め、当院の役割を明確にしていく必要がある。

以上の取り組みを通じて、TQM を基盤とした継続的改善を推進し、医療の質、安全、経営のバランスを図りながら、変化する医療環境に対応できる組織能力の強化を進めていく。

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２０２６年度

デミング賞
受賞報告講演要旨

SONA BLW Precision Forgings Limited, Driveline Division

Chapter 1 – Company Profile

1.1 Foundation Years of SONA Group

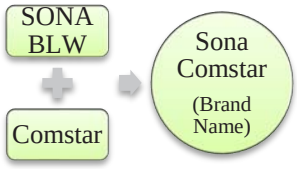
SONA Group was founded in 1988 by Late Dr. Surinder Kapur with establishment of 'Sona Koyo Steering Systems Limited'. **Sona Koyo Steering Systems Limited won 'The Deming Prize' in 2003.** SONA Group diversified in 1995 by forming 75:25 joint venture with Mitsubishi Materials of Japan thus establishing the company, **Sona Okegawa Precision Forgings**, for the manufacture of warm forged near net-shaped Bevel Gears for Differential applications in India. In 1998, company commenced production of Differential Bevel Gears at its first plant (Unit-I) in Gurugram, Haryana, India. During the years, the company added customers for Bevel Gears in different vehicle segments namely Passenger vehicles, Commercial vehicles and Off-Highway vehicles. The company also acquired initial capability for in-house manufacturing of Dies.


Warm Forged Gears

In 2005, the company started a second plant in the city of Pune, west of India. In 2008, Sona Okegawa acquired forging business division of Thyssen Krupp's (inventor of warm forging technology) having three plants in Germany and one plant in the USA. **Sona Okegawa Precision Forgings Limited (Gurugram Plant) won 'Award for TPM Excellence Category-A' in 2011 and 'Award for Excellence in Consistent TPM Commitment' in 2013**. Also in 2013, the company was renamed **SONA BLW Precision Forgings Limited (SONA BLW).**

1.2 Growth of SONA BLW

Since its inception, SONA BLW has expanded its product portfolio by adding new products and increasing its overseas customer base. The company has also strengthened its die-making and engineering capabilities. In 2017, the company acquired 25% stake of Mitsubishi Materials and became an independent company. The Gurugram plant (Unit-I) **expanded with the addition of two more units** (Unit-II and Unit-III). In 2018, SONA BLW **kicked off TQM Journey** for Business Excellence and adopted TQM practices across all functions.



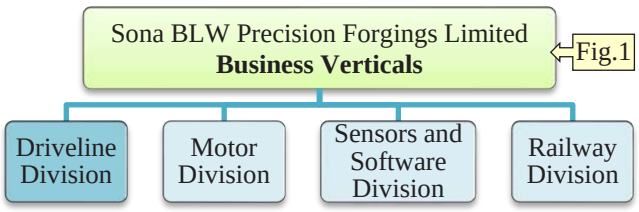
Company name (legal entity)
SONA BLW Precision Forgings Limited

In 2019, Blackstone (a US based Private Equity firm) acquired 66.3% stake in the Indian operations of the company. In the same year, SONA BLW acquired Comstar Automotive (a starter motor business formerly part of the Visteon Group), with a vision to develop powertrain products for electric vehicle (EV). Comstar operates in India, China, Mexico, and the USA, and manufactures conventional, micro-hybrid starter motors and later added EV traction motors, and motor control units. This acquisition led to the creation of the **Sona Comstar** brand.

Also in 2019, SONA BLW **diversified into aggregate products** and established the **Manesar plant, a state-of-the-art facility for manufacturing** Differential Assemblies and Final Drive Gears for the electric vehicle applications. In 2021, SONA BLW got listed in the Indian Stock Exchanges and became a public company. Blackstone fully exited the company in 2023.

A new **bigger plant in Chakan (Pune)** was built and got operationalized in 2022. This became a second manufacturing footprint similar to the Gurugram mother plant. In 2023, SONA BLW acquired Serbia based Radar Sensor solutions provider, named 'NOVELIC' that makes electronics and software systems for Advanced Driver Assistance Systems (ADAS), Automated Guided Vehicles (AGV), and industrial automation. In 2024, the company expanded its aggregate manufacturing capabilities by establishing a **Mexico plant** in Silao to produce differential assemblies. In the same year, Manesar plant (Unit-I) expanded with the addition of one more unit (Unit-II). In 2025, SONA BLW acquired the Railway Equipment Division from Escorts Kubota.

In summary, SONA BLW is an India based mobility systems and components manufacturer. The company designs, manufactures and supplies highly engineered, mission-critical automotive systems and components to customers worldwide across all major vehicle categories.



As shown in Fig.1, SONA BLW Precision Forgings Limited has four business verticals. The consolidated revenue of SONA BLW in the fiscal year April 2024 to March 2025 (F25) was INR 35,545 million (USD 391 million). The company enjoys the distinction of being one of the world's largest independent manufacturers of precision forged gears for differentials with a global market share of 8.7%* and being the producer of the world's lightest starter motor. *(* - calculated using CRISIL methodology in December 2025)*. Out of the four verticals, the **Driveline Division is the applying unit for The Deming Prize**.

1.3 Major Milestones of SONA BLW

Year	Milestone
1995	Incorporated as SONA Okegawa Precision Forgings Limited, a JV with Mitsubushi Materials

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1999	Started production at Gurugram Plant
2005	Started production at Pune plant
2011	**Received Award for TPM Excellence Category-A**
2013	**Renamed as SONA BLW Precision Forgings Limited**
2013	**Received Award for Excellence in Consistent TPM Commitment** (Gurugram Plant)
2017	**TQM journey begins**
2019	SONA BLW acquires Comstar and forms a new brand identity – **Sona Comstar**
2019	Launch of Manesar plant
2023	Launch of Chakan (Pune) plant
2024	Launch of **Mexico Plant** at Silao
2026	Achieved production **milestone of 500 million Gears** and **10 million Differential Assemblies** in March

1.4 Core Values of SONA BLW

There are four core values which define the way SONA BLW conducts its business. These core values are practiced by the people and form the organization culture. They are:

a) Integrity *(Always do the right thing. No matter what the cost. No matter if anyone is looking)*
b) Vitality *(Build better products)*
c) Frugality *(Build better products - more economically)*
d) Agility *(Build better and more economical products - faster)*

1.5 Presence across Globe

SONA BLW has twelve manufacturing facilities located in India (8), the USA (1), Mexico (2) and China (1).

Manufacturing Footprint - Driveline Division

SONA BLW – Driveline Division has 6 manufacturing plants in India (3 in Gurugram, 2 in Manesar, 1 in Pune) and 1 overseas plant (in Silao, Mexico).





Gurugram Plant (Mother Plant, Head Office)	Unit-I	Forging and Heat Treatment Operations, Tool and Die shop, All support functions shared with all plants (Engineering, Marketing, HR, Purchase)
	Unit-II	Raw Material Store, Billet cutting, Machining, Pre-Dispatch Inspection
	Unit-III	Hard Machining, Pre-Dispatch Inspection, Dispatch
Pune Plant		All operations like Gurugram Plant and Assembly of Differential Assembly
Manesar Plant	Unit-I	Gear Shop, Heat Treatment and Differential Assembly
	Unit-II	Housing Machining, Heat Treatment
Mexico		Housing Machining, Gear Shop, Differential Assembly

1.6 Products - Driveline Division:

Driveline Division started with manufacturing Differential Bevel Gears through precision forging. We progressed to make Differential Assembly for Off-Highway applications. We started manufacturing more value-added products in the forging component business and started supplying Bevel Gears for Electric Vehicle applications. We added Differential Assembly with Final Drive Gear for Battery Electric Vehicles. Now our product portfolio includes Spool Gear, Electronic Differential Lock, Epicyclic Gear Train, Intermediate Gear, Spiral Bevel Gears, Open Differential and Steering Bevel Box.

Product Category		Features	Applications
Precision Forged Gears		•	-Passenger vehicles -Commercial vehicles -Off-highway
Differential Assembly		•	-Passenger vehicles -Commercial vehicles -Off-highway

1.7 Business Environment

1.7.1 Industry Background

According to S&P Global Mobility, global light-vehicle sales reached 88.2 million units in CY 2024, a 1.7% increase over the previous year, driven by stabilizing supply chains and steady consumer demand. But subsequently major

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markets - North America, Europe, and Asia - experiencing challenges due to geopolitical tensions, supply chain issues, stagnation in electrification due to shift in electrification policies.
Persistent headwinds including conflict in Europe, Red Sea disruptions, elevated interest rates, trade policies and broader macroeconomic uncertainty, North America is showing tendency of contraction. European market is also constrained by recession risks, tighter credit and reduced EV subsidies.
While towards the end of 2025 and early 2026, Indian market continued to grow due to government policies and investment. The passenger vehicle market is showing moderate growth by 2-4%, commercial vehicles by 7%. The off-highway segment is continuing to show strong growth and expected to grow by 7%. However, the recent war in the middle east have added uncertainties that we are experiencing currently.
North American automobile electrification landscape is also undergoing a shift characterized by stagnation in battery electric vehicle (BEV) sales and the rise of hybrid vehicles, caused by policy-driven shifts following the reduction of incentives.
In our other market Europe, due to supply issues and policies, the electric vehicle programs are getting delayed and shifting towards hybrid vehicles due to compliance-driven requirements.

1.7.2 Customers
Our products are used in Drivetrain for transmission of power. Our customers comprise Domestic, International vehicle makers and Tier-1s catering to Passenger, Commercial and Off-highway vehicle categories.

1.7.3 Competition
Forged Bevel Gear capability exists with certain vehicle makers and some Tier-1 companies and SONA supplies Bevel Gears even to them. While SONA BLW is a pioneer in warm forging in India, there are other domestic forging companies trying to get into warm forged Bevel Gears. Our Marketing team continuously gathers information about the competition. We innovate and add more value to products to have an edge and be ahead.
We sign Long Term Agreements with our key customers to secure businesses and strengthen our relationship. We are continuously upgrading our technologies, skills and manufacturing capacities. We are reviewing our technology roadmap with a 5-year horizon, by mapping market, customer needs and future technologies.

Chapter 2 – Vision and Business Objectives

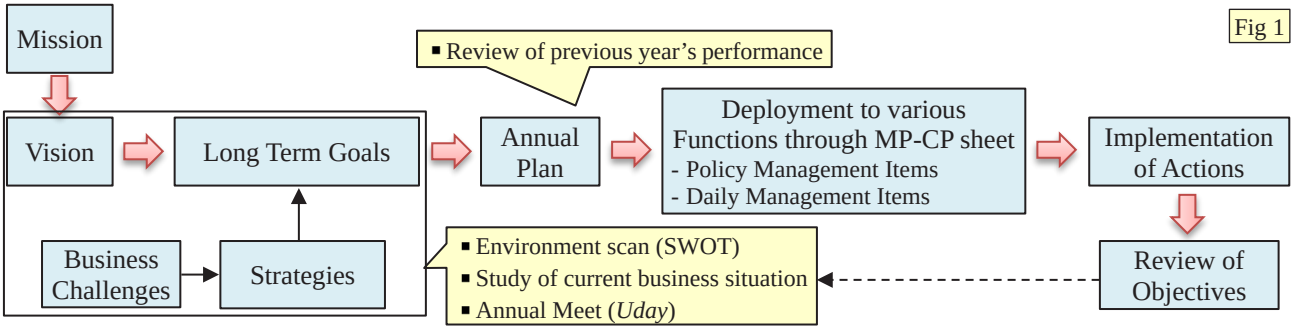
2.1 Background
In this chapter, we outline the process used to define and implement Vision, customer-focused long-term goals, and strategies adopted by SONA BLW (Driveline Division). The chapter also highlights the key challenges faced during the journey and provides an overview of the initiatives taken to overcome them.

2.2 Mission and Vision
We formed our Mission and Vision in F17 and periodically reviewed to access the gaps. We revised Vision in F25 and set it up till F27. The revisions are explained below.

Mission: Be a leader in technology for building products that enable the future of mobility.
Vision: To become a dominant driveline component and aggregate solution provider for our customers while expanding exposure to New Energy Vehicles (NEV).

2.3 Vision Realization Process
SONA BLW follows a structured and systematic approach to translate its Vision into actionable outcomes across the organization. This approach ensures strategic alignment, effective deployment, and continuous review, enabling the company to respond proactively to both internal and external business dynamics.
SONA BLW's process of Vision realization is explained through a schematic diagram below (*Fig. 1*):

Fig 1



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The vision realization process begins with a comprehensive assessment of the business environment. This assessment includes:

- An **environment scan** to understand external market conditions, competitive landscape, and industry trends.
- A study of the **current business situation**, evaluating operational performance, financial health, and overall market position.
- **Annual Meet (*Uday)*** to understand priorities and plans from the five-year rolling plan.

Strengths	Weaknesses
• Manufacture of warm forged near net shaped Bevel gears • Leading Manufacturer of Bevel Gears • Self Design and Testing Capability • Strong Customer Base – supplying to top Global OEMs for EVs • Inhouse Die manufacturing Capability • Relationship with customers • Fast ramp up of creating manufacturing capacities • Long association of employees with SONA	• Development Lead Time • Product Portfolio gaps • Customer Distribution • Data usage and analysis
Opportunities	**Threats**
• Entering in new markets and adding customers • New Business Models → Exploring new revenue models (adding products other than automobile industry) • Moving towards more valuable products • Explore products for new energy vehicles (hybrid, plug-in, fuel cells)	• Disruption in Global EV market • Rapid change in quality requirements • Economic and Trade policies • Change

***Uday (means 'To rise')**: Top management and functional heads jointly review the five-year strategic plan. Every year, team evaluates the previous year's performance, reviews achievements and gaps, and aligns on priorities and action plans for the coming year.*

These inputs along with **business challenges** help to identify the **strategies** required to meet the **long-term goals** of the organization.

An **Annual Plan** is developed in alignment with the long-term goals. The Annual Plan is prepared by incorporating inputs from the review of the previous year's plan.

The Annual Plan is then deployed across various functions in the form of **Managing Points (MPs) and Checking Points (CPs)**. These are monitored and reviewed by the respective owners at defined frequencies to ensure disciplined execution and timely corrective actions.

2.3.1 Business Challenges:

To achieve our long-term goals, we encountered challenges during the phase of rapid expansion. During this period, the company transitioned from being a component supplier to a provider of multiple driveline aggregate solutions to customers, significantly increasing both complexity and severity. The key challenges identified in F18 are outlined below:

a) **Rapid Expansion**: As customers integrated Precision Forged Bevel Gears into their New Energy vehicle programs and realized tangible benefits such as improved strength, reliability, performance, and reduced NVH. Encouraged by these advantages and SONA BLW's engineering capabilities, customers increasingly requested us to develop gears for a larger number of vehicle programs. This surge in demand required SONA BLW to rapidly scale its development, manufacturing, and support capabilities.

b) **Enhanced Complexity**: With a rapidly expanding customer base, SONA BLW faced a wide range of customer-specific requirements, including diverse product features, material specifications, quality standards, and unique packaging and logistics needs. The introduction of Differential Assemblies further increased complexity by adding challenges related to sourcing and managing multiple child parts. Additionally, as the export market grew, SONA BLW needed to strengthen capabilities across all business functions to support global customer operations.

c) **Increased Severity in Customer Requirements**: As SONA BLW demonstrated its core competencies, customer expectations evolved from a "Build to Print" approach to a "Build to Specification" model. Customers increasingly recognized SONA BLW as a technology partner and domain expert, seeking its involvement in early stages of future product designs. Expectations shifted with SONA BLW assuming full responsibility for design, testing, and validation. Consequently, the organization faced challenges in reducing development time and building testing capabilities.

Strategic Recalibration and Emerging Challenges (F25 onwards):

Up to F24, the organization continued to face significant challenges as mentioned above. We did the PDCA (Plan-Do-Check-Act) cycle post this period to recalibrate our strategies. This decision was also influenced by changes in the external environment, including geopolitical developments and effects on electrification of vehicles which required a proactive recalibration to sustain growth.

Since F25, the organization has been addressing the following key challenges:

a) **Drive Innovativeness**: SONA's market has been concentrated in certain geographies, from where most of its sales were realized. With a slowdown in EV demand, customer program delays, and new projects postponements, this posed a risk to maintain growth. The evolving external environment and changing customer preferences required us to recalibrate our product strategy and introduce new products and penetrate into new markets to look for new customers.

b) **Strengthen Agility**: Enhancing organizational agility is essential to remain competitive and resilient. While capacities had been created following customer growth projections and when those projections were not happening, a key challenge was in transforming these installed capacities into flexible, multi-model production lines.

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c) **Enhance Customer Success**: Customers expect to develop and launch products in shorter and shorter time at better competitive price. Meeting this expectation has become increasingly challenging. This demands continuous improvement in PQCD (Productivity, Quality, Cost, and Delivery) performance. In addition to this, leveraging new technology and adapting quickly to customer demands becomes inevitable.

2.3.2 Strategies:

To address the above new challenges and achieve long-term goals, we have developed the strategies listed in *Table 1*. These strategies are essential for SONA to overcome existing business issues and maintain business growth. The table also highlights the significance of each strategy for SONA.

Table 1

Strategies	Significance of Strategy
a) Adopting Technology in Advance	• To strengthen long-term competitiveness and continually enhance customer value o Proactively develop competencies to expand into new product categories and market segments o Adopt advanced manufacturing methods
b) Future-ready Quality Management	• Increasing new requirements, fast paced expansion and complex value chain demands a future-ready approach to Quality Management o Establish a robust, future-ready quality framework supporting current and next-generation mobility requirements o Anticipated future customer needs, build capabilities proactively and strengthen systems / processes for higher reliability
c) Meeting Evolving Delivery Requirements	• Rapid expansion led to complexities in supply chain o Synchronized Material Flow, Multi-model Manufacturing, Maintain Inventories and Alternate Sourcing
d) Building People Capability	• Acquiring and strengthening people's capabilities for changing business environment o Developing competencies and skills for business growth o Building organizational culture enhancement for employee involvement
e)	
f) Digital Transformation	• Need for better data management as business grows. This also requires scaling up and securing IT infrastructure. o Digitalization of processes to enable data driven decision making o Scaling technology systems, strengthening cybersecurity governance to protect data and ensure uninterrupted operations

The above strategies and initiatives taken in each are explained in General DTQMP Chapters (numbering 5 to 10).

Together, these strategies ensure SONA to be innovative, competitive, and achieve long-term goals of global market leadership in differential bevel gears, increased NEV revenue, and add products to portfolio to win customers.

2.3.3 Long Term Goals (Business Objectives):

A snapshot of long-term goals, along with year-wise targets and supported strategies, is shown below:

Long Term Goals (Business Objectives)	Plan							Strategies
	F17	F18	F20	F22	F24	F25	F26	
	A	T	T	T	T	T	T	
Global Market Share of Differential Bevel Gear	Data measuring started in F20			xx	xx	xx	xx	• Adopting Technology in advance • Future-ready Quality Management • Meeting Evolving Delivery Requirements
Revenue from NEV business	xx	xx	xx	xx	xx	xx	xx	• Adopting Technology in advance • Future-ready Quality Management • Managing Financial Discipline
Supplying to Global OEMs of NEVs	xx	xx	xx	xx	xx	xx	xx	• Adopting Technology in advance • Managing Financial Discipline • Digital Transformation
Product Portfolio (Number of products)	xx	xx	xx	xx	xx	xx	xx	• Adopting Technology in advance • Building People Capability

The above goals are set for a period of three years. These goals are reviewed in case there is significant change in external environment.

2.3.4 Annual Plan

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The annual plan is derived from the long-term goals which form the CEO Policy for the year. The CEO policy is then deployed to all functions.

Chapter 3 – Policy Management and Daily Management

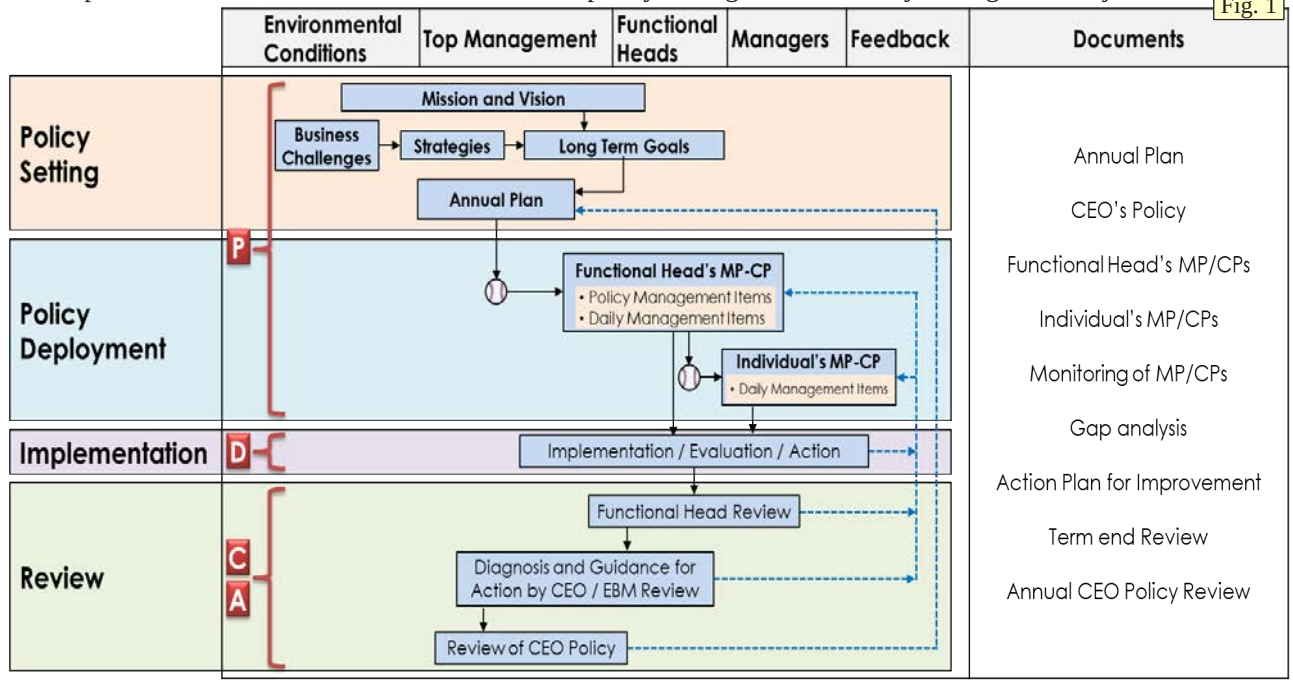
3.1 Background

The TQM journey in the SONA Group started in 1998 (Sona Koyo Steering Systems Limited) under the guidance of Japanese TQM Guru. After realizing the benefits, we decided to start the TQM journey in SONA BLW and kicked off the same in 2017. We deployed the policy and daily management across the organization in systematic manner under the guidance of Japanese Sensei.

3.2 Policy Management

The policy management process starts with Mission, Vision, determination of goals, deployment of actions leading to review of results. Objectives are derived from the Annual Plan (CEO Policy) for all functions. Functional Head's and Department Head's MP-CP sheet contains both policy management and daily management objectives.

Fig. 1



Legend: Operating Flow ⟶ Feedback - - -▶ Catch Ball

Policy Management is divided into four sections (as shown in *Fig. 1*) namely,

a) Policy Setting b) Policy Deployment c) Implementation d) Review

3.2.1 Policy Setting

The annual plan derived from the long-term goals (as mentioned in *Fig. 1*) forms the CEO Policy for the year. To improve every subsequent year's policy, inputs from previous year's Diagnosis are incorporated. Thus, the Annual Plan (CEO policy) sets the directions (guidelines) for organization for the coming financial year. The Annual Plan for F26 is shown below:

Truncated

Policy items	Objective	UOM	Actual (F25)	Target (F26)	Major Measures	Deployed to
Meeting Financial Targets	**EBITDA**	Rupees in Million	xx	xx	a) Capacity Utilization b) Improve Operational Cost Elements	ABC
Expanding Market and Product Portfolio	**New Order Intake Total**	Peak Annual Value in INR	xx	xx	New Business (sales) from new and existing customers	ABC EFG

3.2.2 Policy Deployment

CEO Policy is deployed to various functions in the form of MP-CP sheet (Managing Point and Checking Point). As an example, F26 CEO Policy contains the objective of "New Order Intake Total". To achieve the same, major measure taken was "New Business (sales) from new and existing customers", which was deployed to Head Marketing.

Managing Points and Checking Points (MP-CP of F26)				
Location: Gurugram	Department: **Marketing**	Name: EFG	Designation: VP	Reporting to: CEO

Truncated

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Role	To drive sustainable business growth and building customer relationships, while continuously understanding and responding to future mobility needs.								
Responsibilities	**MP No.**	**Managing Point**	**UOM**	**Target (F26)**	**CP No.**	**Checking Point**	**UOM**	**Target (F26)**	**Deployed to**
Order Booking	2	New Business (sales) from new and existing customers	Rupees in Million	xx	3	Customer Addition	Number/ Annum	4	HIJ
					4	RFQ generation (New Products)	Number/ Annum	12	

From Head Marketing, the Checking Point is deployed to 'Key Account Manager' which is shown below:

Managing Points and Checking Points (MP-CP of F26) Truncated								
Location: Gurugram	Department: **Marketing**	Name: HIJ	Designation: GM	Reporting to: EFG				
Role	Achieving sales while generating and converting RFQs.							
Responsibilities	**MP No.**	**Managing Point**	**UOM**	**Target (F26)**	**CP No.**	**Checking Point**	**UOM**	**Target (F26)**
Ensuring growth	6	Customer Addition a) Existing products b) New products	Number/ Annum	4	-	-	-	-

Similar process of deployment is followed across all functions, departments for Policy Management items.

3.2.3 Implementation

The objectives derived from Policy Management (PM) items are monitored by Functional and Departmental Head. The Daily Management (DM) items are monitored by individuals in standard formats in all departments. Each individual works on the implementation of actions identified to achieve his / her managing point or checking point. They check the achievement level of targets at defined frequency using graphs and Gantt chart. If any gap exists between the target and actual, action plan is made in the form of PDCA in 'Implementation Status' sheet, for corrective actions on MP or CP.

3.2.4 Review

The objective of review is to periodically track managing / checking points and take timely actions which will minimize the variations in results. Review mechanism aims to resolve issues through various meetings by involving management.

Stages of Review:

Frequency	Reviewer			Review Content
	CEO	COO	Functional Head	
Yearly				• **Annual Meet** (*Uday*)
Half-Yearly				• **Term End Review** / **Mid Term Review** to review the status of Annual Plan along with corrective action taken and its effectiveness
Monthly				• **Executive Board Meeting** (EBM) covering Technology roadmap, HR metrics, Go-to-Market, Financials, Capex

3.3 Impact of Policy Management

Policy management has played a pivotal role in driving sustained business growth. These efforts have directly contributed to strong financial growth, portfolio expansion, and enhanced market presence over the years. Few of the achievements are shown below:

- Customers increased by 2.1 times.
- 70 times growth between F23 to F25 from new customers and new products.
- Product portfolio increased by 5 times.
- Revenue improved by 3.2 times.
- EBIT increased by 3.7 times.
- Market share of Differential Bevel Gear improved by 1.9 times.

3.4 Daily Management

Daily Management (DM) Items (Managing Points and Checking Points) for monitoring routine activities are identified for each functional head till supervisor level in every function. These activities are ensured by following the standards / SOPs. If anomalies are observed, then actions are taken to avoid recurrence, and standards are revised if required. This DM practice is followed across all departments in Driveline Division

Department	**Level 1**	**Level 2**	**Level 3**	**Level 4** Truncated Sample

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Operation	Manufacturing Cost	Tool Cost	Cutting surface area per Insert	Tooling life against standard
		Heat Treatment Cost	Methanol Cost	Furnace wise Flow monitoring
			Steel Shots consumption	Full load/No load current monitoring for blaster wheels
Quality	COPQ	Inhouse Rejection	Process Capability improvement	Parameters monitoring through control chart
Purchase	Supplier rating	Supplier Rejection	Action implementation from SRM	

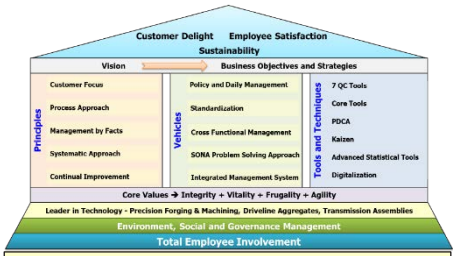
Table #1

Chapter 4 – TQM Introduction and Promotion

4.1 Why SONA BLW adopted TQM?

Sona Koyo Steering Systems Limited benefited by implementing TQM. Hence, SONA BLW also adopted TQM and applied the TQM principles across all units. SONA BLW is implementing the TQM under the guidance of Japanese Sensei.

4.2 TQM Framework (TQM House) and TQM Kick-off:



TQM Framework (TQM House)

To start TQM Journey, we first selected two model lines in manufacturing and two support functions for implementation of Daily Management activities in June 2017. We also developed **TQM House** as shown here.

After getting satisfactory results in model lines, we started adopting it across the company. On **18th September 2017**, **TQM implementation was formally kicked off** by Mr. Sunjay Kapur, then Managing Director, along with top management and Sona *Parivar* (Family) in the townhall meeting.



TQM Kick Off

4.3 TQM Governing Structure:

TQM governing structure at SONA BLW has three tiers, consisting of Business Excellence Council (TQM Apex Council) at Division level, TQM Promotion Committee at Function level and TQM Departmental Committee at Department level.

1) **Business Excellence Council (TQM Apex Council)**: Committee comprises of Chief Executive Officer (CEO), Chief Operating Officer (COO), Head - Corporate Quality Assurance (CQA) and TQM team. Evolving overall policies, guidelines and assessing TQM implementation status are the responsibilities of Apex council.
2) **TQM Promotion Committee**: Committee comprises of COO, Head - CQA, Plant Heads, Functional Heads, and TQM team. This committee provides support, guidance and ensures TQM practices in all functions/plants. Audits and reviews are conducted at predetermined frequency and ensure the closure of improvement points.
3) **TQM Departmental Committee**: The committee comprises of Plant Heads, Functional Heads, Section Heads, Supervisor and TQM team. To facilitate TQM implementation, each function has 'Department Coordinators'. This committee promotes TQM knowledge and motivates the people for implementation of TQM activities.

4.4 Major TQM Activities:

4.4.1 Establishment of Quality Management

a) **Policy Management (PM)**: As a part of Policy Management, Managing Points are deployed from CEO policy to functional heads and subsequently from functional heads to their reportees. At all levels, target setting process is carried out through catch ball sessions.
b) **Daily Management (DM)**: The MP-CP sheet contains Role related Managing points (DM items) and Policy related Managing points (PM items). For gaps observed between targets vs actuals, interim and permanent actions are initiated through "Plan Do Check Act" (PDCA).
c) **Cross Functional Management (CFM)**: CFM systems are being established and operated to achieve organizational objectives in a rapidly changing business environment. CFM enables effective coordination across functions to address complex issues that cannot be resolved within a single department. Multiple CFM teams are currently working on key focus areas such as gear-quality improvement, metallurgical control and advanced statistical problem-solving. The teams meet at defined intervals to review progress, analyze issues, and execute assigned actions. Clear objectives, timelines, and responsibilities are defined for each CFM theme.

4.4.2 Training on TQM Tools and Techniques

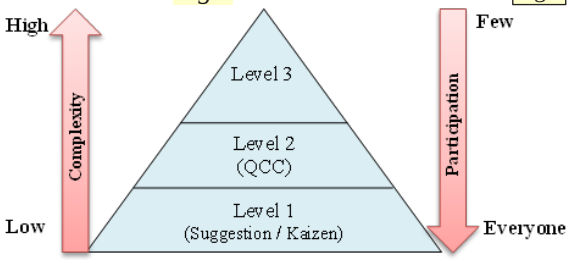
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At the start of this journey, **1S and 2S training** was conducted to improve basic shop-floor work conditions. Thereafter, Japanese Sensei conducted multiple training sessions to strengthen problem-solving capabilities (**QC Circle**, **QC Tools**, **QC story approach**), **Policy Management** and **Daily Management**. To improve process quality, training on **Standard Operating Procedures (SOPs)** and **Statistical Process Control (SPC)** was also provided. TPM training was conducted to implement the **'My Machine' concept (I Maintain – I Operate)** on the shop floor. Currently, the focus is on developing skills in **advanced statistical tools** and the **use of control-chart rules** for early identification of anomalies.

4.4.3 Formulation of Improvement Methodology

At SONA BLW, all improvements are classified under three levels as shown in *Fig.1*.

Fig.1



a) **Level 1**: It is Gemba improvement through suggestions and kaizens. The focus group is primarily operators (including contractual employees). Only implemented suggestions are considered as Kaizens.

b) **Level 2**: The next level is Quality Control Circle (QCC) with focus groups of operators and staff using scientific tools. The QC Circle prioritizes problems from the problem bank created from chronic issues in DM covering PQCDSM. Till F26, we have **completed >1,500 projects** across all locations.

c) **Level 3**: These are based on higher level complexity and impact of problems. In this level, advanced statistical tools, like DOE, Hypothesis testing, ANOVA, Multivariate analysis etc. are used. Till F26, we have **trained several employees** in these advanced methodologies and completed >15 **improvement projects**.

4.5 TQM Promotional Forums:

TQM is promoted to achieve business objectives through various platforms as below:

a) **Communication Meeting**: Communication Meetings are conducted every month by CEO. CEO shares information pertaining to the Company / Plant performance, highlights of the previous month, market conditions and distributes prizes for the best Kaizen and QCC projects.

b) **Reviews and Audits**: To sustain the TQM activities and monitor the departmental performance, periodic reviews and audits are conducted through **Quality Visits**. The review is conducted at Bi-monthly frequency by CEO / COO. Functional Heads review the TQM implementation within their respective functions and take actions, wherever improvements are required.

c) **Competitions**:
- **Internal Competition**: To promote TQM activities, QCC internal competitions are conducted on quarterly frequency. These competitions help in sharing knowledge among teams and also to motivate employees. The best QCC projects are rewarded as per the Reward and Recognition Policy.
- **External Competition**: The winners of QCC are nominated for external competitions, conducted by various agencies like Confederation of Indian Industry (CII) and Automotive Component Manufacturers Association (ACMA). By participating in such competitions, employees' morale improves and rewards received by them further motivate other employees. **Since F21, several teams participated in external competitions and won awards in external forums**.

d) **Nav-Parivartan Magazine**: It is a periodic magazine circulated to all employees. It contains thoughts of top management, knowledge sharing on TQM concepts and improvement stories.

e) **Knowledge Byte**: We also share knowledge on TQM concepts through emailers called **'Knowledge Byte'** to create quick awareness among employees. **Since F25, 12 Knowledge Bytes have been released**.

Chapter 5 – Adopting Technology in Advance

5.1 Overview

SONA had expanded rapidly and with increased competitive landscape, we remain committed to drive innovation and enhance customer success. To sustain our leadership, we proactively track emerging technologies and build the competencies needed to stay ahead. SONA BLW introduced many products and technologies which were first time in India such as warm forging technology for manufacturing of Bevel Gears, special Laser Welding technology. By continuously embracing cutting-edge technologies and developing products in advance, we have expanded our competitive edge. This enabled meaningful differentiation for customers and ensuring we remain a preferred partner as they grow and succeed.

5.2 Challenges to meet Strategy

- Early technology investment with returns not certain
- Dependency on customers for system level testing
- Choosing the relevant technological solution

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5.3 Business Challenges and Strategic Initiatives

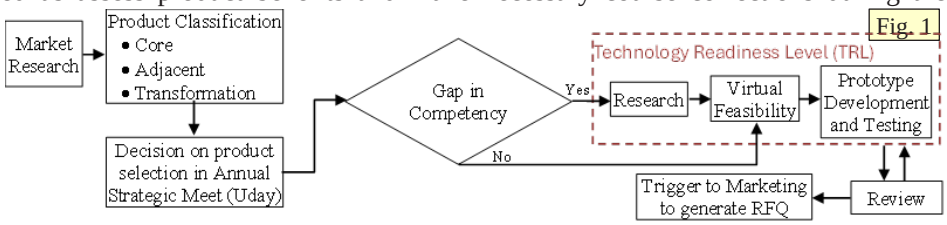
Business Challenges			Strategic Initiatives
DI	SA	ECS	
●		●	1) Proactively develop Competencies and build Products
●		●	2) Build value added products
	●	●	3) Adoption of Manufacturing Technologies
	●	●	4) Build Testing Competencies

DI - Drive Innovativeness | SA - Strengthen Agility | ECS - Enhance Customer Success

5.4 Major TQM Activities

5.4.1 Proactively develop Competencies and build Products

To remain competitive and become a future-ready organization we drive innovation in products and manufacturing processes. We assess market trends and evaluate global peers to understand the future direction of the industry. This enables us to identify the projects and processes to be adopted. The identified projects are reviewed by management in Annual Meet (*Uday*). The product development commences once projects are shortlisted and approved. Progress is closely monitored through weekly and monthly reviews. These reviews provided inputs for the next stages of development. They also helped us assess product benefits and make necessary course corrections during the development phase. The following process (*Fig. 1*) followed to develop competencies and build products:



The product development process converts our strategy into products across Core, Adjacent, and Transformational areas. It links value creation with how products are developed and what we offer to the market.

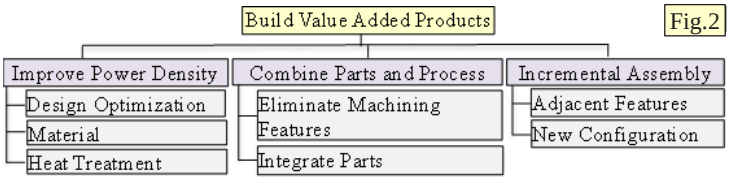
Technology and Product Strategy Across Core, Adjacent and Transformational Domains		
Value	**How**	**Products**
Redefining Business	**TRANSFORMATION** • Assess future market by scanning, benchmarking, co-development • Analyse gaps in technology, tools, competencies	Prdt 1 Prdt 2 Prdt 3
Upgrade for Value Creation	**ADJACENT** • Apply electronics intelligence focusing on vehicle safety • Alternate constructions for lightweighting and performance	Prdt 1 Prdt 2 Prdt 3

By proactively strengthening our design capability for 'X' gears and differential assemblies, we developed a significantly improved 'X' assembly which met expected durability life. This aligns with future Corporate Average Fuel Efficiency (CAFÉ III) norms effective in India from 2027, focusing on lightweight design to enhance efficiency and reduce transmission losses.

By using the above strategy, we **developed ~30 competencies which helped us to build ~25 products since F18**.

5.4.2 Build value added products

To be a technology partner with customer and remain competitive, we continuously add value to the core products by improving the power density and combine parts and processes, refer *Fig.2*. Each of these areas plays a fundamental role in achieving higher efficiency and reliability in our product offerings.

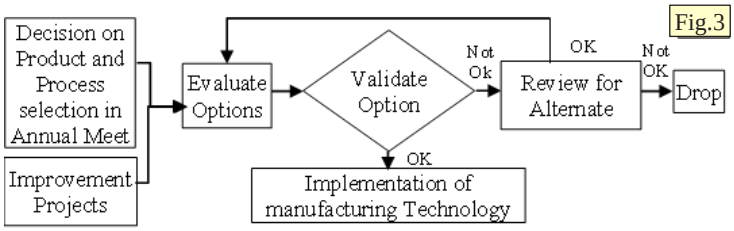


Using the process to enhance power density of gears (AT), we succeeded in producing bevel gears with an increased life up to ~2 times greater than that of traditional gears (Forged).

Our commitment to constant value addition (combine parts and processes) has helped us in the successful introduction of several products that are recognised as 'First in India'. These innovations have not only enhanced our product portfolio but have also contributed directly to sales. By enhancing the value of our core products through formed features, reduced machining, and part integration, we successfully introduced several first-in-India products. Their evolution into multiple customer variants demonstrates the strong impact and success of our value-addition strategy. By using the above strategy, we **developed 19 value added products since F18**.

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5.4.3 Adoption of Manufacturing Technologies



By adopting advanced manufacturing technologies ahead of time, we aim to address upcoming customer needs and adapt to shifting market trends in the areas of product quality and manufacturing efficiency. Our agile approach enables quick adaptation to changing customer requirements and ensures proactive readiness to enhance customer needs. This methodology not only accelerates time-to-market but also strengthens customer successes by providing solutions and maintaining high standards of quality. Process is explained in *Fig. 3*

5.4.4 Build Testing Capability

To strengthen agility and enhance customer success, we have invested in advanced test systems which ensure product test requirements. By keeping all design iterations and testing in-house, we have built confidence on product performance which helps us developing a reliable, validated product faster.

Since F18, we have been receiving product performance specification requirements from customers with no requirement for product testing. The product physical testing was scope of customers. We anticipated requirement to arise for physical testing and proactively build competencies. We started with durability testing in F10 and built further testing capabilities. **Now we are offering testing as a separate service to customers**. The generated test data has also helped us to develop products with reduced iterations and better performance predictability. For new adjacent and transformative products, we intend to develop testing capabilities in advance.

By using the above approach, we **developed several testing capabilities since F18.**

Chapter 6 – Future Ready Quality Management

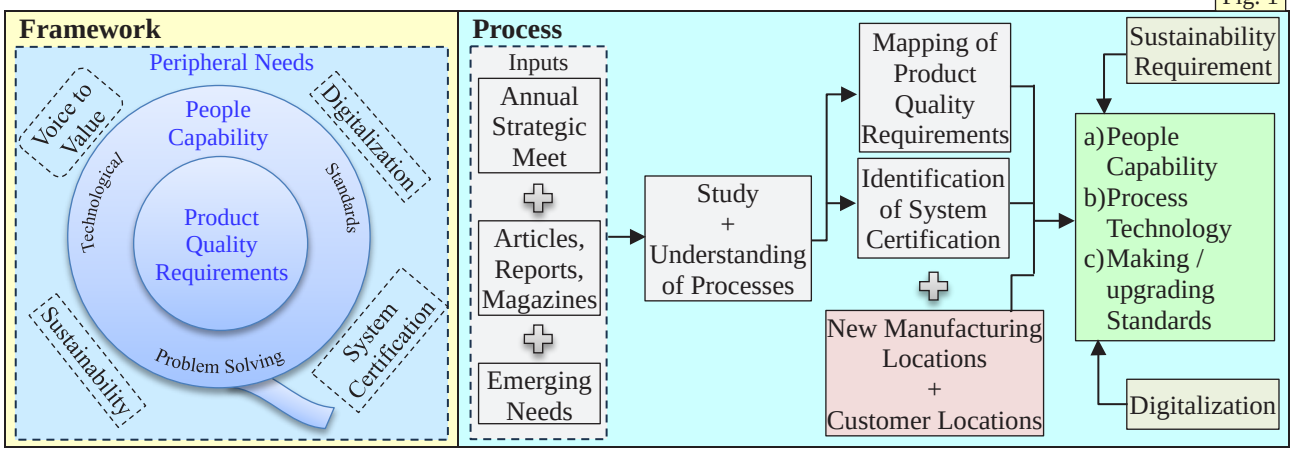
6.1 Overview

In an increasingly competitive and rapidly evolving automotive landscape, SONA BLW's growth strategy requires a truly future-ready approach to Quality Management. The industry's shift toward electrification coupled with rising customer sensitivity to NVH, efficiency, and durability has significantly elevated expectations for product performance, process capability, and system robustness.

At the same time, emerging demands such as green packaging, cybersecurity, and digitalization are also evolving as overall business quality requirements. Recognizing these trends, SONA proactively anticipates future customer requirements and begins building the necessary operational capabilities well in advance, including strong statistical foundations and digital enablers. Equally important is a proactive approach to capturing the voice of the customer and embedding lessons learned to drive continuous improvement across all functions.

The framework and process for future-ready quality management are explained below:

Fig. 1



The framework in *Fig. 1* represents a forward-looking approach to Quality Management. This framework adapts to evolving customer expectations, technological advancements, and global standards. At its core, the framework emphasizes that future-ready quality is not limited to meeting product requirements but also integrates people, processes, technology, digitalization and sustainability into a unified system of excellence.

The initiatives detailed in this chapter demonstrate how SONA is building a robust and future-ready quality framework that supports current business needs while preparing the organization for next-generation mobility requirements.

6.2 Challenges to meet the Strategy

- Upgradation of processes in rapidly demanding scenario.
- Systematic collection, analysis, and implementation of emerging customer requirements.

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- Effective data analysis and data management.

6.3 Business Challenges and Strategic Initiatives

Business Challenges			Strategic Initiatives
DI	SA	ECS	
●		●	Meeting Evolving Quality Requirements
●		●	Adopt Peripheral Needs
	●	●	Develop Capability in emerging technologies, standards, and smarter problem-solving
DI - Drive Innovativeness		SA - Strengthen Agility	ECS - Enhance Customer Success

6.4 Major TQM Activities

6.4.1 Meeting Evolving Quality Requirements

In *Fig. 1*, **Product Quality Requirements** is at the center of the framework. This shows that quality begins with clear expectations for performance, reliability, and durability. As customers transition to electrified fleets, their expectations for durability, efficiency, and NVH have increased. This shift demands higher product accuracy from us. The process shown in *Fig. 1* outlines a complete cycle that begins with gathering insights from multiple sources, such as strategic meet, articles, magazines, and emerging customer needs. After collecting these inputs, we study and understand the process in detail. We then proceed with mapping of product requirements.
The identified product quality requirements are for improving gear tooth accuracy, fit and function accuracy and metallurgical properties enhancement. Few improvements are explained below:

6.4.1.1 Bevel Gear Accuracy Improvement

Bevel Gear accuracy has improved through enhancements in Die quality and optimization of forging process parameters. In addition to many, two parameters identified as critical for achieving accuracy. By adopting these improvement in our forging process the current acceptable level of Gear quality DIN Class for ICE (Internal Combustion Engine) vehicles was improved to meet DIN Class for Electric vehicles needs . There are ongoing trials to meet higher accuracy levels of DIN.
The inputs are captured through a structured Future-Ready Quality Management process (*Fig. 1*), enabling us to address evolving product quality requirements in advance.

6.4.2 Adopt Peripheral Needs

In *Fig. 1*, **Peripheral Needs** on the outer ring reflect the expanding ecosystem of quality which comprises of:

a) Voice to Value	b) Digitalization	c) Sustainability	d) System Certification

These needs represent emerging customer expectations, market trends, and innovation drivers that influence future-ready quality management strategies.

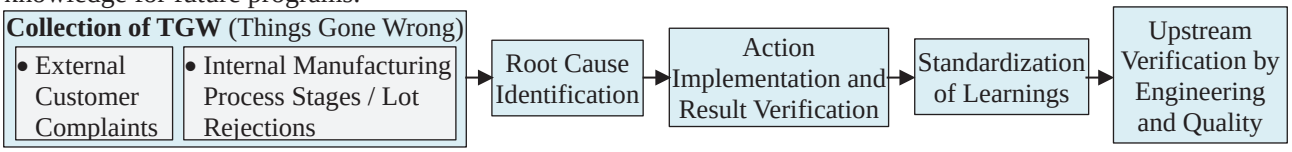
6.4.2.a) Voice to Value Creation

A) Customer Voice

Effectively capturing the Voice of the Customer enables us to understand customer needs and translate them into actionable improvements across products, processes, and systems. By embedding customer expectations into our quality planning and execution, we strengthen our capability to meet both current and future business requirements. We follow a systematic process from capturing customer voice to its successful implementation.
By using the above approach, we have **implemented Customer Voices** and updated or created **139 standards**. This has resulted in 70% reduction in **Customer Complaints**.

B) Lessons Learnt Implementation

With business expansion accelerating, we are onboarding new customers and launching products at a faster pace. To ensure faster and more stable ramp-ups, it is critical to systematically capture, analyze, and apply learnings from past failures. Implementing lessons learnt prevents recurrence of known issues, improves first-time-right performance, and strengthens product and process robustness.
A structured Lessons Learnt process has been established to convert 'Things Gone Wrong (TGW)' into preventive knowledge for future programs.



By capturing TGWs, identifying root causes, standardizing effective solutions, and deploying them proactively, the organization achieves faster ramp-ups, reduced quality risks, and improved customer satisfaction. This strengthens a culture of continuous learning, prevention, and operational excellence. Till F26, we have **captured 192 lessons learnt and standardized**.

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6.4.2.b) Digitalization

Digitalization has become essential for building resilient and future-ready organizations. By integrating physical processes with digital technologies, we are shifting from reactive to a predictive approach, autonomous, and self-correcting quality system. It enables the quality function to:

• Detect early signals of process deviation	• Predict defect occurrence before non-conformance occurs

Below are the enablers for Digital tools:

i. Online Data Capturing System	ii. Application	iii. Dashboard

With the use of Digital tools, it helps us in real-time data capturing, analytics, defect prevention, traceability of parts, fast response and fact-based decision making. These digital tools enhance agility in our processes and partnering in customer success.

6.4.2.c) Sustainability:

Sustainability makes us future-ready by aligning our operations with evolving environmental, regulatory, and customer expectations. Sustainable practices help us to protect the environment while creating long-term value for customers, society and new businesses for the organization.

Area	Actions taken	Benefits
Green Packaging	• Use of recyclable and returnable packaging	**42% parts transitioned to green packaging solutions**
Green Manufacturing	• Use of recycled steel as input raw material • Recovery of water from wastewater to use in process • Electric vehicles used for intra-plant material movement	- Till F26, 73% of raw material is from recycled steel - 100% movement on Electric vehicles
Green Energy	• Installation of 4 MW onsite solar powerplant • Commissioned 18.85 MW offsite solar power plant	Green Energy share improved to about 30%

By adopting the process for capturing peripheral requirements and its fulfilment enables us in being innovative in our actions so us to partner in customer success.

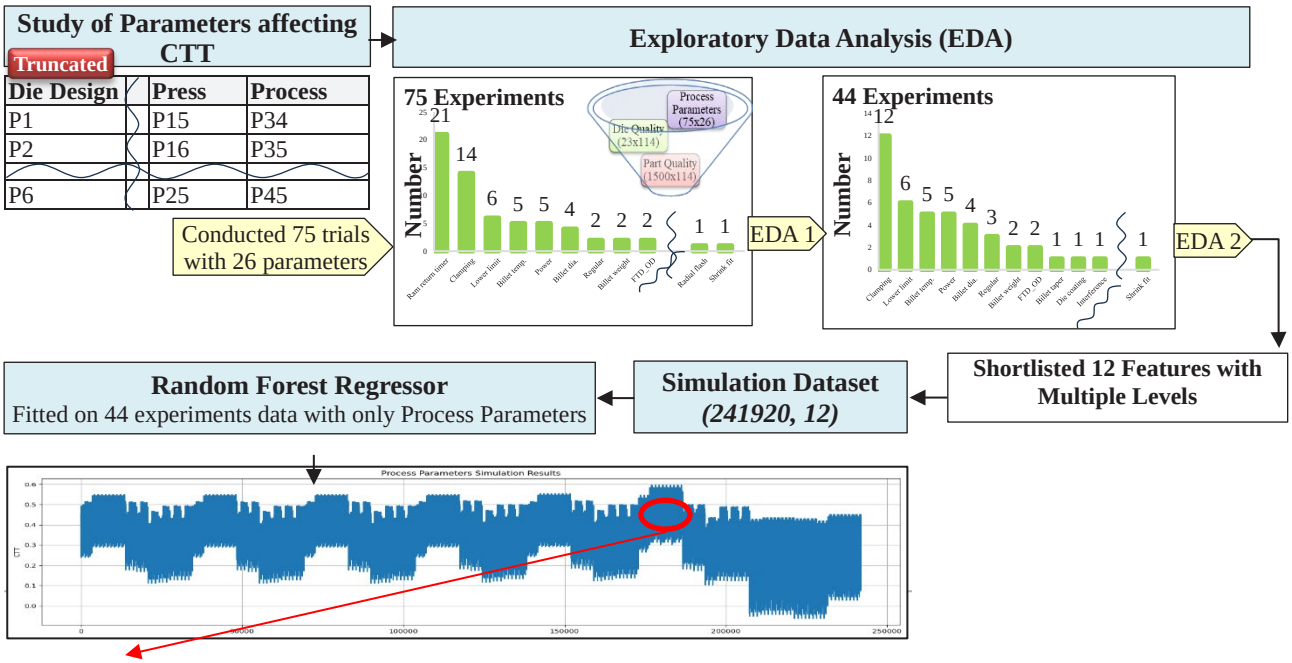
6.4.3 Develop Capability in emerging technologies, standards, and smarter problem-solving

As mentioned in *Fig. 1*, the next step is to build people capability on new technologies, processes, problem-solving, and standards which enables to fulfil future ready requirements.

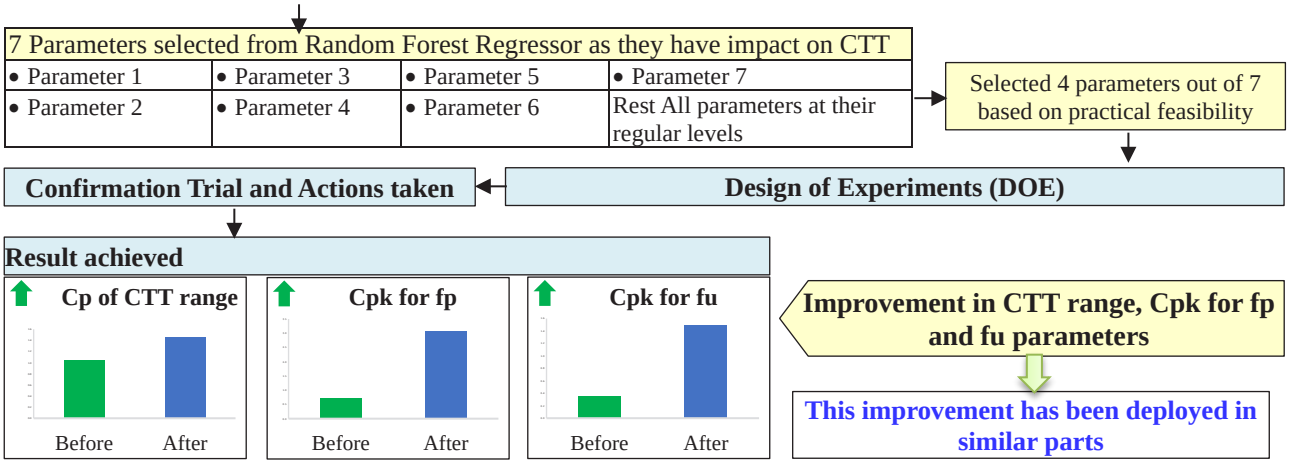
We are developing people's capability to meet various **standard requirements** which are essential for the organization. VDA 6.3 and CQI are specialized automotive industry process-audit and manufacturing capability standards that help organizations strengthen process reliability, product quality, and customer confidence.

Developing people capability in problem-solving is essential for building deeper analytical skills and structured thinking across the organization. By investing in advanced analytical tools such as DOE, ANOVA, and TRIZ, we are strengthening the competencies needed for the future.

As an example, one improvement case of is explained below showing the deeper analysis:



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In totality by using statistical tools, we have **trained multiple employees** in these advanced methodologies and completed **several improvement projects**.

Continuously building capability in process technology, implementing key industry standards, and using advanced statistical problem-solving tools enabled us to be agile. This strengthened process reliability, enhanced product quality making it possible for SONA to develop future-ready competencies across the organization.

Chapter 7 – Meeting Evolving Delivery Requirements

7.1 Overview

SONA BLW started supplies of Differential Bevel Gears and gradually expanded its product varieties including Divider Gears, Epicyclic Gears, Electronic Differential Locks, Differential Assemblies, and Intermediate Assemblies.

We are supplying 815 SKUs to 64 customers across 148 locations worldwide (refer *Fig.1*, *Fig.2* and *Fig.3*). Our growth was rapid across multiple customers, geographies, increased SKUs, multi delivery modes with varying customer demands. This increases operational and supply chain complexities. To address this, we have synchronized material flow, made manufacturing lines flexible, maintained inventory in warehouses near to customers and capacity enhancement at suppliers.

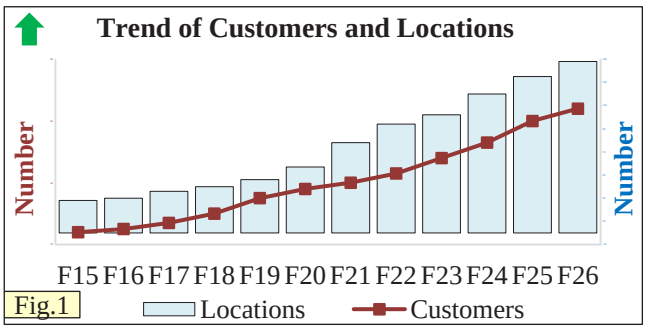


Fig.1

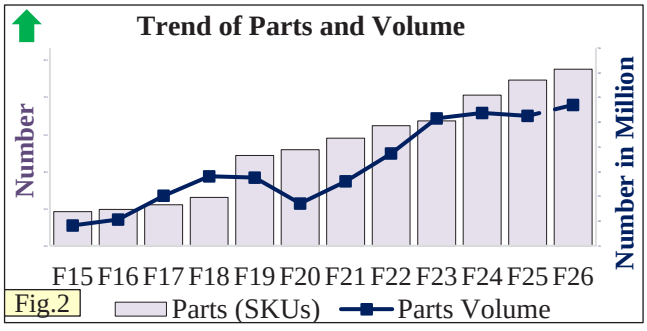


Fig.2

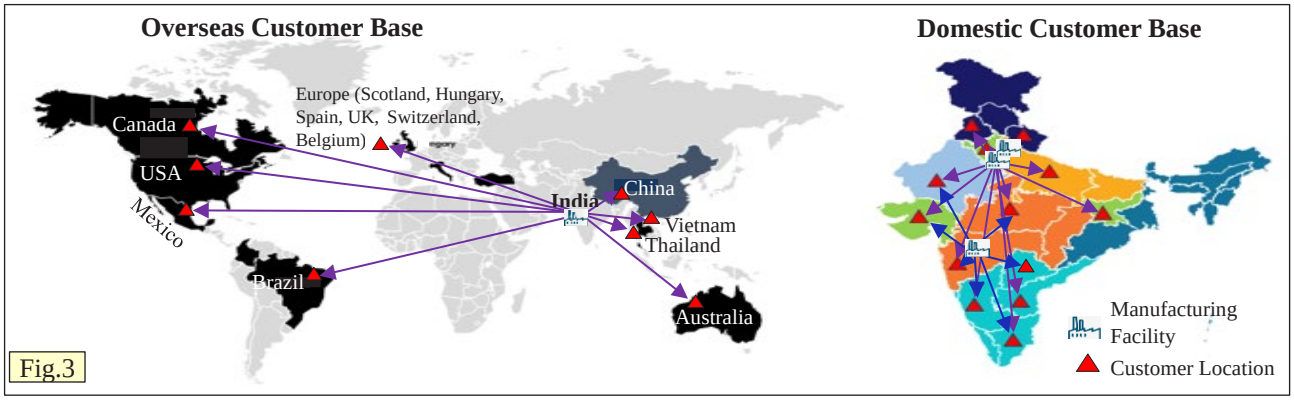
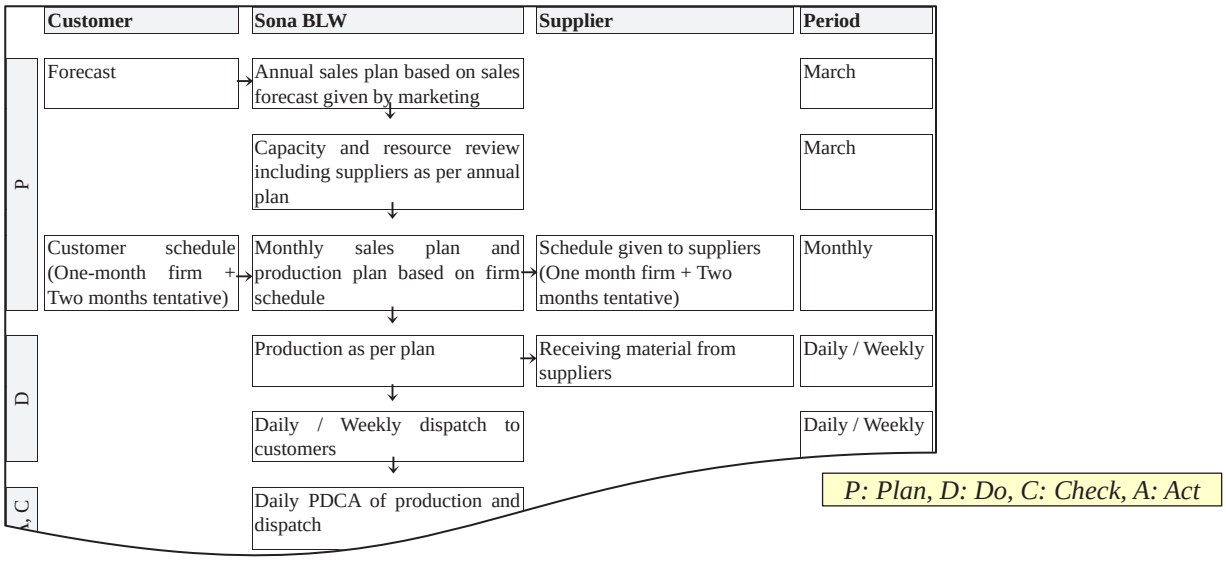


Fig.3

Delivery Management System:

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7.2 Challenges to meet Strategy

SONA BLW continues to expand rapidly its product varieties and customer base, introducing greater complexities across supply chain. Below are the challenges:

- Aligning operations and delivery systems to meet complex multi delivery modes and fluctuations.
- Sustaining inventory level at warehouse amid logistics route changes (Geo-political uncertainties).
- Dynamic capacity utilization to address diverse product demand.

7.3 Business Challenges and Strategic Initiatives

Business Challenges			Strategic Initiatives
DI	SA	ECS	
	●	●	1) Defining Delivery Management System through Multi Delivery Modes and Managing Delivery
	●		2) Creating Flexibility in Operations
●		●	3) Satisfying evolving Packaging, Logistics and Digital Requirements
	●		4) Dynamically Managing raw material requirement
DI – Drive Innovativeness		SA – Strengthen Agility	ECS – Enhance Customer Success

7.4 Major TQM Activities

7.4.1 Defining Delivery Management System through Multi Delivery Modes and Managing Delivery

SONA supplies to multiple customers across the globe through a supply chain that operates with multiple delivery modes.

With complex delivery modes and volatile market demands, agility in planning and flexible operational control across the supply chain have become essential. This directly supports our ability to enhance customer success. To address this challenge, we have taken the following actions:

7.4.1.1 Synchronized Material Flow	7.4.1.2 Reduced Turnaround Time (TAT)

7.4.1.2 Reduced Turnaround Time (TAT)

TAT refers to the time taken to deliver material from SONA to the customer. We observed significant variation in TAT, which affected warehouse inventory levels. To remain agile and enhance customer success, we are following the process below to reduce TAT:

Mapping of transit stages → Data collection of time taken in each transit stage → Study the data to find the abnormality → Identify the stages with improvement potential → Implement action and standardization

One example of **Customer DH for TAT reduction** by using above process is explained below:

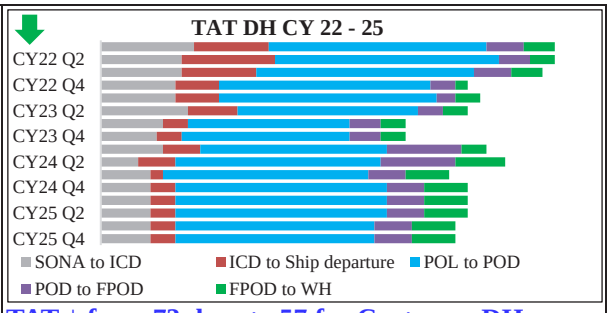
The following are the four stages of total transit time from SONA to Customers:

Stage-1: SONA to ICD	Stage-2: ICD to Ship departure	Stage-3: POL to POD (Shipment on water)	Stage-4: POD to FPOD Sea Port to ICD	Stage-5: ICD to warehouse

Note: ICD: Inland Container Depot; POL: Port of Loading; POD: Port of Discharge; FPOD: Final Port of Discharge

Findings from data	Actions Taken	Effects

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• Longer duration from SONA to POL • Shipment waiting at POL. • Shipments are not synchronized with vessel sailing. • Sailing through longer route via European ports.	• Changed ICD from Delhi to Garhi-Harsaru (Haryana) which is non-congested and nearer to SONA plant. • Plan and dispatch shipments from SONA in line with sailing schedule to avoid waiting time at POL. • Improved route optimization by avoiding EU transshipment ports and routing shipments via Spain (Tanger Med Port) which is less congested.	 **TAT ↓ from 73 days to 57 for Customer DH**

Similarly, we have implemented actions for **Domestic shipments** which resulted in **TAT reduction by 35%**.

By using the above process, we have improved **Delivery Rating from 96.5% (F18) to 99.8% (F26)**.

7.4.2 Creating Flexibility in Operations

As our SKUs, customer locations, and production volumes continue to increase, we must remain agile and create flexibility in our operations. To support this, we have implemented the following actions:

• Enabling equipment for multi-model Manufacturing	• Implementing one-piece flow	• Reducing setup time

Out of the above three actions, one is explained below:

7.4.2.1 Enabling equipment for multi-model Manufacturing

To manage the growing complexity of increasing SKUs and a larger customer base, it is essential to produce multiple parts on a single line and the same part on multiple lines. To enable this flexibility, we identified several improvement enablers across different shops, which are explained in the table below:

Truncated List

Forging	Heat Treatment	Machining	Coating	Differential Assembly
Holder diameters	Process parameters	Jigs and fixtures	Jigs and fixtures	Fixturing
Robotic jigs and fixtures	Loading pattern	Clamping method	Process parameters	Tooling
Clamping method	Material grade families	Club operations		Quick changeover

After identification of enablers, we implemented following actions:

• Commonization of Die holders and clamps	• Commonization of jigs, fixtures, steel diameters
• Commonized Recipe for manufacturing	• Changes in process sequence
• Making families of material grade	• Quick changeovers

By enabling equipment for multi-model manufacturing, we have improved **Number of SKUs/Equipment** and reduced **Batch size**.

7.4.3 Satisfying evolving Packaging, Logistics and Digital Requirements

To enhance customer success, we are committed to meeting customer-specific requirements in packaging, logistics, and digitalization. The following key actions have been taken to fulfil these requirements:

7.4.3.1 Commonization of Pallet Size

We **standardized the outer packaging for 147 parts** to maximize shipping volume and improve storage efficiency by aligning with European and American pallet standards. This initiative streamlined our processes, resulting in faster TAT and reduced inventory levels of packaging material.

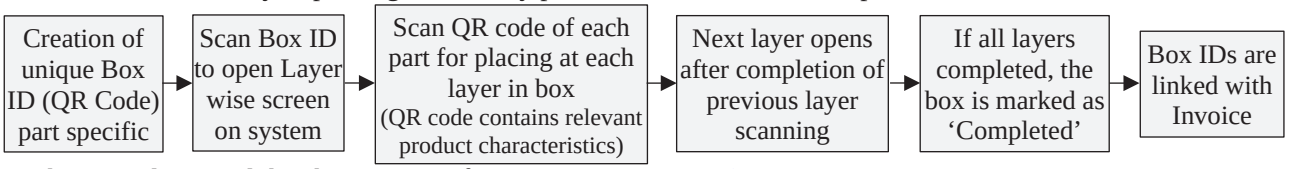
7.4.3.2 Fulfilment of customers' Digital Requirements

a) Electronic Data Interchange (EDI)/ Advance Shipment Notification (ASN) implementation

To meet customer requirements for moving from manual to digital supplier scheduling, we implemented EDI. Customers also requested digital shipment notes, which we deployed as per their needs. Over time, we **expanded EDI/ASN coverage from 12 customers to 37**, significantly strengthening digital integration across supply chain.

b) Digital Traceability of Assembly in Packaging

To enhance traceability, we proactively implemented an in-house–developed software at Manesar plant. This innovative solution enables retrieval of exact location of any part within packaging. It has also strengthened customer satisfaction by improving traceability performance. We follow the process outlined below:



We have implemented the above system for **12 customers covering 31 parts.**

Chapter 8 – Building People Capability

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8.1 Overview

To drive innovation and enhance customer success requires various capabilities and competencies to be built across the organization. As our units are multiplying, the requirements of competent people at different locations are also needed. So, we have strategised 'Building people capability' across all levels of the organisation.
We are developing employee competencies aligned with the business objectives and requirements identified in Annual Meet (*Uday*), strengthening cultural enablers and building an engaged workforce. We are developing an agile and resilient workforce through which we are addressing business challenges.

8.2 Challenges to meet Strategy

- Develop competencies to adapt to rapid technological changes
- Employee participation
- Consistent engagement

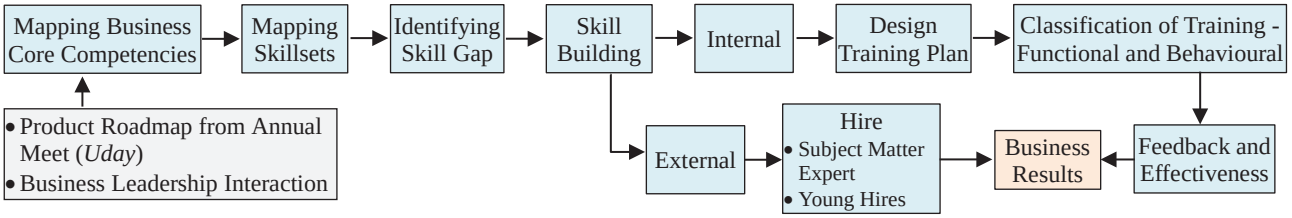
8.3 Business Challenges and Strategic Initiatives

Business Challenges			Strategic Initiatives
DI	SA	ECS	
●		●	1) Fulfill Human Resource talent to meet growth
	●	●	2) Organizational Cultural Enhancement
	●		3) Employee Engagement and Experience
DI - Drive Innovativeness		SA - Strengthen Agility	ECS - Enhance Customer Success

8.4 Major TQM Activities

8.4.1 Fulfill Human Resource talent to meet growth

With new products, technologies, and emerging customer expectations, the business complexities has increased significantly. This created a strong need to build capabilities by developing resources and strengthening existing competencies. To address this need, we followed a structured process of competency mapping and resource development, as outlined below:

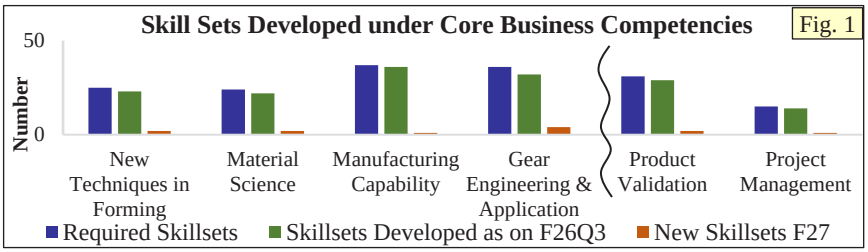


Business core competencies were mapped (such as New Techniques in Forming, Gear Engineering and Application, Material Science, Operation Excellence, Product Validation, Project Management and Core Tools) from the inputs collated during the annual meet and interaction with leadership team. Then, we mapped the skillsets under each competency. Based upon the skills requirement, we identified the resources and developed them through training programs. These resources were put into the new programs and work assignements to apply the learning. Wherever the skills were not readily available or could not be developed inside, they were met by hiring from outside to fill the gap. This continuous effort helped us in developing the resource to meet the customer requirements, add new technologies and adoption of new processes. The following table shows how we developed internal resources to support the business strategies:

Truncated Sample

Strategy	Role requirement and identification	Actions to build capability
Adopting Technology in Advance	Head of Gear Engineering	• Conducted competency assessments aligned with future-ready gear engineering. • Identified skill gaps and conducted internal and external training on VLFM, Product design feasibility, Product Management, Shot peening, DOE, Core tools, VDA, Data Analytics. Enabled hands-on application through enhanced **engineering leadership roles**.
Future-ready Quality Management	Leading Quality function of Differential Assemblies	• Conducted competency assessments aligned with future-ready quality expectations. • Identified skill gaps and conducted internal and external training on VLFM, DOE, VDA, CQI for Heat Treatment and Laser Welding. Enabled hands-on application through enhanced **quality leadership roles**.

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By following the above process, we developed resources internally under business core competencies as shown in *Fig. 1*. **88 resources developed for 174 distinct skill sets** (between F18 to F26).

Other than the business core competencies, we continuously focus on enhancing the skills for employee development and manufacturing excellence. The following focused development initiatives were taken to enhance the skills of employees for meeting the business growth:

a) **VSME** (Visionary Small and Medium Enterprise - Value Stream Mapping): The program is aimed to improve On-Time-In-Full (OTIF). This training is imparted to streamline the processes, improve overall efficiency, synchronization with customer demand, synchronizing delivery flows, 3S improvement (safety, short distance, space saving) and continuous improvement practices to enhance Delivery performance. This resulted in **On-Time-In-Full (OTIF) improvement**.

b) **Leadership Skills**: Identified employees are sent to Leadership skill development sessions to build the leadership qualities. Since F24, 36 participants attended various programs such as 'Leadership Development Program (II Edition) by ACMA', 'CEO (Creating the Extraordinary Organization) through TQM by Indian Society for Quality', 'VLFM', 'Certified Leadership Course on Public Relations and Corporate Communications by CII', 'Discover the Power Within' and 'Look beyond Breakthrough'.

In case internal development is not possible, then we externally hire candidates based on business and competency requirements. We have taken below actions:

a) **Hiring Subject Matter Experts (SMEs):** To **address specialized business needs** for niche or critical roles, job descriptions are made in alignment with required competencies. Recruitment was done after market mapping. We **built partnerships with the sourcing partners, industry associations and professional networks** to hire an expert. This helped us in **creating resource pools** and induct in core functions like Material Science, Business Analytics and Green field operations. **29 numbers of Subject Matter Experts hired since F18**.

b) **Young Hires *(Graduate Engineer Trainees and Management Trainees)*:** Competencies or skills requiring longer assimilation periods were identified, and engineers were recruited from institutes. A structured six-month internship program has been designed to provide holistic exposure across product design, manufacturing operations and quality. During this period, candidates' knowledge assimilation and attitude has been assessed periodically before absorption in regular grades as employees. Till date, **86 engineers hired**, including 30 in engineering department, 17 as manufacturing supervisors and remaining in various departments.

The above section explains the competency and skill development for staff. We are also doing the **Skill Enhancement of Operators** which is explained below.

Till 2018, the operator skill development was done through On the Job Training (OJT) which took longer for the operator to move to next level. In July 2018, 'DOJO' skill development centre was established. Every new operator begins their journey with a six-day DOJO program that covers eight standardized modules. The training curriculum has steadily evolved, with greater emphasis on process-related skills. The machine prototype in DOJO provides real time machine working experience. Since its establishment in 2019, DOJO has been upgraded every year as depicted in *Fig.2*.

Fig.2

F19 ⇒	F20 to F23 ⇒	F24 to F26
8 Modules • Company Overview • Safety DOJO • Product DOJO • Five Senses DOJO • Production Rule • Quality DOJO • Process DOJO • Maintenance DOJO	• **Gear Machining**: Hobbing, Shaping, Broaching, Milling • **Gear Grinding**: Grinding, Lapping, Honing, Shaving, Burnishing • Hot Part Handling • Defects Gallery • Fire Safety board • Packing DOJO	• Foot safety and PPE use simulator • Loose cloth simulator • Finger injury simulator • Forklift Driver safety DOJO • Embedded test • Paperless Evaluation

Post training, written assessment test is conducted to check the effectiveness. The skill enhancement process through DOJO improved operator's **Learning Assessment Score** in first attempt improved to **91%** (F26).

Skill enhancement is done through On the Job Training (OJT) and then skill evaluation is carried out. The overall **Skill Index improved to 2.24 (Dec-25), despite 1.7 times increase in operator strength**.

8.4.2 Organizational Cultural Enhancement

To strengthen agility and improve organization culture for customer success, there is a need to improve the organization culture by developing and encouraging employees to take data-driven decisions. To enhance organizational culture, following actions were taken:

1) Leadership Development Program	2) Strengthening Suggestion Scheme

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3) Building Continuous Improvement Culture through QCC	4) Strengthening Safety Culture

8.4.2.1 Leadership Development Program

We develop our managers through a focused leadership development program to realize the organization's growth strategy through Visionary Leadership for Manufacturing (VLFM) program. This program is now run by Confederation of Indian Industry (CII).

In 2007, the program was initially conceptualized between JICA (Japan International Cooperation Agency), CII, IIT (Indian Institute of Technology) and IIM (Indian Institute of Management) along with industry leaders including our founder Dr. Surinder Kapur and Prof. Shoji Shiba, an international expert in TQM and breakthrough management.

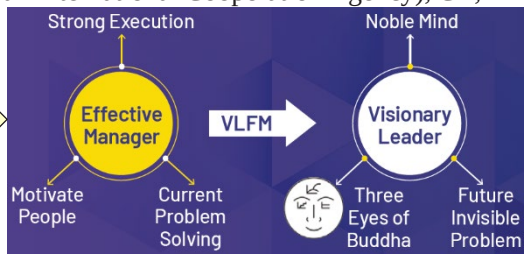


Fig. 3

The program transforms individuals through mindset change and structured skill building in a unique and effective learning environment. It enables participants to develop a deeper understanding of Breakthrough Management. The visual (*Fig. 3*) illustrates the leadership journey from an Effective Manager to a Visionary Leader through the VLFM journey.

The program helps participants shift their thinking from Small 'm' (only production oriented) to BIG 'M' (entire manufacturing environment) perspectives. This shift enables value creation and strengthens the business value chain. The program also instils key leadership disciplines, including a Customer First attitude, the habit of Listening, and ownership through the principle of 'The Buck Stops Here'. VLFM is a one-year program built on a 'Do and Demonstrate' learning approach. Each year, we nominate managers for the program to build a strong leadership pipeline. This initiative supports the company's ambitious growth objectives. **31 managers have completed the VLFM program** so far, 14 managers are now leading business or functional head roles.

8.4.2.2 Strengthening Suggestion Scheme

The Suggestion Scheme aims to encourage employees for sharing ideas on safety, quality, productivity, cost, and workplace improvement. To strengthen Suggestion Scheme, **Token Reward has been introduced** in F22. Over the years, the suggestion scheme and process got strengthened and the **suggestion/person/year improved by 5.2 times**.

8.4.2.3 Building Continuous Improvement Culture through QCC

The objective of quality circle is to build Kaizen culture and promote employee involvement. QCC empowers employees to identify, analyze and solve workplace problems in a structured and collaborative method. QCCs create a sense of ownership and accountability by giving frontline team members a voice in improving quality, productivity, safety, and cost. We conducted continuous training programs to enhance problem-solving skills.

As a result, **employee participation in QCC increased** despite 3.3 times increase in manpower. Since F21, many teams has represented the organization in various **external competitions** demonstrating organization's maturity in problem-solving.

Our efforts to create positive change **extend beyond organization**. We actively engage with different sections of the community, as outlined below:

Customer	• Established structured channels to share insights, best practices, and product knowledge. • Strengthened long-term customer partnerships, integrated them into product-development cycle. • Conducted awareness sessions for **8 customers** to date.
Supplier	• Conduct targeted training and capability-building workshops for suppliers. • Trained suppliers till date on various topics like 5S, Safety, Measurement System Analysis (MSA), Statistical Process Control (SPC).
Institutional Collaboration	• Supported two startups on rural diagnostics for women, space technology, H_2 mobility solutions. • Supported four early-stage mobility-technology startups with the potential to create over 100 jobs. • Provided educational scholarships to 15 women from underprivileged backgrounds.
Society	• **Computer Literacy Centres:** Focused on improving digital inclusion and computer literacy to underprivileged communities. Over **200 people** benefited from this program in the last **two years**. • **School Sanitation and Infrastructure:** Renovation of classrooms and washrooms at Government School in Gurugram.

8.4.2.4 Strengthening Safety Culture

Leadership demonstrates commitment to safety through their behaviour. The safety culture is driven by proactive hazard identification, behavioural reinforcement, and strong engineering controls. Safety systems and standards are implemented across all areas and locations. Continuous training and structured monitoring ensure sustained vigilance and support an incident-free work environment.

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All new joiners undergo mandatory safety training to understand workplace dos and don'ts. A Visitor Management System is in place to ensure visitor safety. All visitors complete safety training through a kiosk in the visitor lounge. Those entering the shop floor receive job-specific safety training in DOJO. In addition, Safety Flash is released within 24 hours of any incident and shared across all locations, from top management to down the line employees.

8.4.3 Employee Engagement and Experience

To strengthen agility and improve organization culture for customer success, there is a need to engage employees in engagement activities and reward them. To enhance participation in engagement activities and better experience for employees, following actions were taken:

8.4.3.1 Workforce Engagement and Satisfaction: Our workforce engagement strategy is structured around five pillars with focused initiatives under each pillar as depicted below (*Fig. 4*)

Fig. 4

Credibility	Respect	Fairness	Pride	Camaraderie
- Month Day Communication - TOC Meeting	- Safe Work Environment - Physical Wellbeing	- Performance Management System - Equitable Rewards	- Cultural Events - External Participation	- Sports Events - Team Building - Suggestions, Kaizens

All the above initiatives are planned and tracked through an Annual Engagement Calendar and executed during the year. Employee engagement effectiveness is assessed annually through an **Employee Satisfaction Survey (ESS)**, which provides an overall engagement score along with feedback. Each year, the survey captures the voice of employees. This feedback is analyzed to identify areas for improvement to refine and strengthen processes and engagement initiatives for the subsequent year, enabling continuous improvement. Some of the actions taken over the years are shown in *Fig. 5*.

Truncated List

Fig. 5

	F18	F19	F20	F21	F22	F23	F24	F25	F26
In-house Canteen									
Transportation Facility									
Birthday Celebration									
Short Leave									
24x7 Doctor Consultation									
Wellbeing Sessions									
Paternity Leave									

By taking above actions, we have **improved Employee Satisfaction Score** over the years despite 1.5 times increase in staff headcount.

8.4.3.2 Reward and Recognition (R&R): R&R scheme was launched in 2014 and has been promoted annually to appreciate exemplary employee performance. The scheme includes on-the-spot awards for immediate recognition, rolling trophies for team performance, certificates for unique contributions, and gift vouchers for sustained participation. These awards are presented during the monthly Communication Meet, where employees gather to celebrate achievements. The initiative has improved motivation and employee participation. In F24, the R&R criteria was revised to broaden its reach and recognize more employees. The focus shifted from line-based recognition to individual recognition. Participation in QCCs and suggestion schemes was added as merit criteria. Before the TQM journey, recognition programs mainly supported shop-floor motivation, service tenure, and manufacturing performance. During the TQM journey, additional recognition platforms were introduced, to support wider organizational engagement and continuous improvement. As a result, **Employee Recognition improved over the years**.

Chapter 9 – Managing Financial Discipline

9.1 Overview

Financial Discipline refers to the systematic framework on how SONA BLW plans, allocates, spends, and monitors its financial resources. This ensures that every financial decision, whether related to Investment, Working Capital, Borrowings or Liquidity Management is made prudently and aligned with short-term and long-term strategic objectives. Maintaining financial discipline creates stability, prudent use of financial resources, and enables corrective actions if any deviation occurs.

At SONA BLW, these financial decisions driven in a disciplined manner continuously have allowed us to remain resilient and sustain healthy margin in a dynamic business environment. By consistently using structured review mechanism, the organization ensures that financial resources allocation is prioritized for strategic investments such as advanced technologies and capacity expansion while mitigating risks at the right time. This disciplined approach helps us in maintaining and improving profitability and ensures that value creation for customers and stakeholders is maintained over the long term.

9.2 Challenges to meet Strategy

With dynamic business environment and expanding operations, we have been using TQM methodology to make prudent and faster decisions involving all relevant stakeholders to address the challenges below:

- Availability of real-time information/ standardized reports for decision making.

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- Interpretation of information from the report and benchmarking.
- Improved credit profile to leverage capital market.

9.3 Business Challenges and Strategic Initiatives

Business Challenges			Strategic Initiative
DI	SA	ECS	
	●		5) Annual Financial Planning and Monitoring
●	●		6) Investment Evaluation (Long term) and Financial Health
●		●	7) Funding strategic capability for future growth
	●		8) Short-term Financial Management and Reporting

DI - Drive Innovativeness | SA - Strengthen Agility | ECS - Enhance Customer Success

9.4 Major TQM Activities

9.4.1 Annual Financial Planning and Monitoring

The process of financial planning and monitoring comprises of three steps as mentioned below:

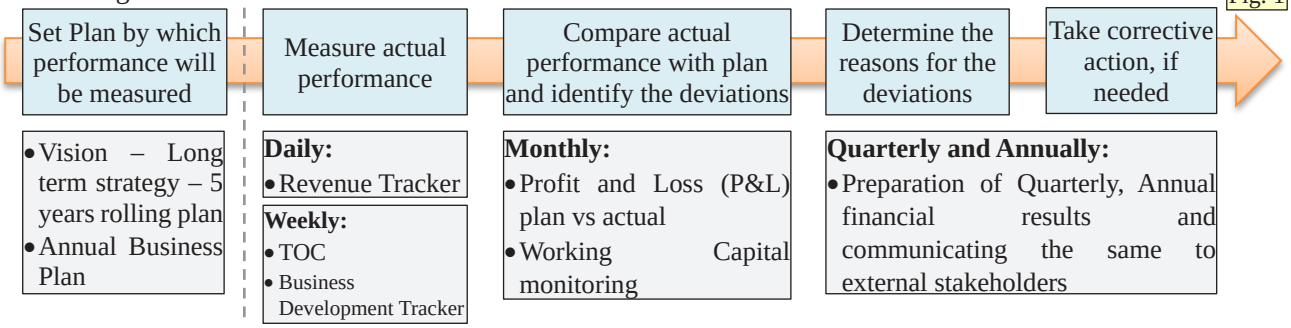
a) **Planning:** SONA BLW sets annual goals in line with its Vision and long-term goals. The revenue and capex targets are set for each division and plant by dividing the plan into Operational expenditure and capex.

b) **Monitoring and Review:** Sales value and cost heads are monitored against the annual business plan. Variable cost heads are reviewed weekly through ERP system and MIS is sent to make necessary action plans. Monthly Executive Board Meeting (EBM) and weekly review meeting (TOC) are held for variance reports and action plans.

c) Corrective Action: Department and plant heads create recovery plans or corrective actions, validated in review meetings, and are monitored by the Divisional Finance Team for regular implementation.

To maintain healthy operating margins, we follow a disciplined approach for cost monitoring across all major elements. These include raw materials, bought-out components, subcontracting, power and fuel, and other operational consumables. All cost elements are regularly aligned with the approved business plan to ensure stable profitability despite changing business conditions. A structured framework (*Fig. 1*) is used for review and monitoring:

Fig. 1



Strong financial discipline is supported by robust profitability analysis and timely financial reporting. These enable informed decision-making by all stakeholders. Profitability analysis helps assess financial performance by reviewing revenue streams and cost drivers, allowing focused actions to improve operational efficiency. Management and key internal teams actively participate in these reviews.

A daily revenue tracker is published for each business unit to monitor performance against the sales plan. Variable and semi-variable costs are reviewed weekly through TOC by tracking actuals and variances. This supports root-cause analysis and timely corrective actions to protect operating margins. Profit and Loss (P&L) statements, along with working-capital reviews, are conducted in monthly Executive Board Meetings to track performance against the annual business plan.

9.4.2 Investment Evaluation (Long Term) and Financial Health

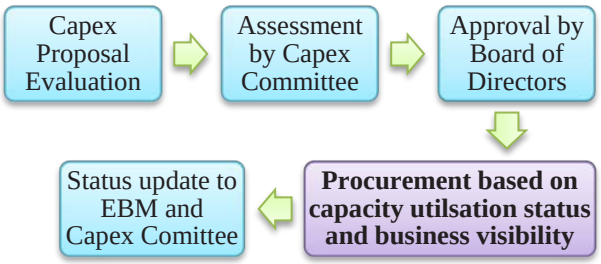
SONA BLW undertakes long-term investments to drive innovation and strengthen organizational agility. A structured evaluation process that assesses strategic alignment, financial viability, and impact on key parameters such as revenue growth, ROCE, and liquidity is used. This ensures disciplined capital allocation while sustaining long-term financial health and stable business growth.

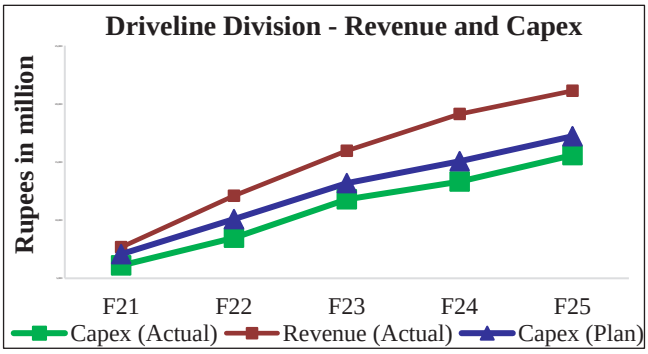
Monitoring Capex Investment

A defined Capex approval process is followed to decide on capital investments, which includes project evaluation and prioritization. The capex undergoes review at different levels and finally approved by Board of Directors (BOD). These approved Capex are then assigned to the business units.

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Steps for Capex Approval:





SONA BLW follows a systemic approach by linking actual commitment decisions with prevailing business visibility and assumptions. **Capital investments are triggered only when existing capacities approach optimal utilization and confirmed or projected business demand justifies the expansion**. This ensures that procurement is need-based, demand-driven, and financially prudent.

9.4.3 Funding strategic capability for future growth

Unlike revenue-generating capex for capacity expansion, investments in capability and technology building do not deliver immediate or direct revenue at the time of approval. The benefits are realized over time by strengthening technical capability, building customer confidence, and enhancing readiness for future business opportunities, as identified in the Annual Strategic Meet (Uday). These investment proposals are evaluated using a combined-return approach. Capability-building investments are assessed together with capacity-building capex, and the overall return is considered for decision-making.

Using this approach, investments were made in **four programs**. Out of these, **three have delivered results**, while the remaining programs are in progress.

Chapter 10 – Digital Transformation

10.1 Overview

SONA's digital transformation journey began with the need to accelerate business growth, improve operational reliability, and eliminate inefficiencies created by fragmented legacy systems. As customer expectations increased and processes became more complex, it was essential to build a **unified and scalable digital backbone** that could strengthen transparency, responsiveness, and long-term capability. To achieve this, Sona launched a structured modernization program focused on three priorities: **enhancing speed and agility, improving process visibility, and enabling data-driven decision making.**

The value-chain below shows that how various digital tools - **Automation**, **Dashboards** and **Artificial Intelligence / Machine Learning (AI/ML)** are now embedded across every stage of Sona's operations.

Digital Application		User
•Electronic Data Interchange (EDI) •Application Programme Interface (API) Integration		**Customer**
•Customer Segmentation Analysis		**Marketing**
•Product Lifecycle Management (PLM) – Design •Engineering Change Note (ECN) •Bill of Material (BOM) Management	•Engineering Workflow Automation •Computer Aided Design (CAD)/ Computer Aided Engineering (CAE) Simulation Tools	**Engineering**
•Project tracking and Software Tools		**R&D**
•Automated Purchase Order workflows in Enterprise Resource Planning (ERP) •Digital Supplier Rating		**Procurement**
•NCR + CAPA Management System •Vision Inspection AI	•Digital Test Recording •SPC Systems	**Quality**
•Auto-generated Advance Shipping Note (ASN) to customer •Warehouse Management System (WMS) - tracking, route optimization		**Sales & Logistics**
•EDI / API Integration •Computerized Feedback/survey System		**Customer Delivery**

Note: Green colour: Automation and Data Capture; Blue colour: Reports and Dashboards; Purple colour: AI/ML and GenAI

10.2 Challenges to meet Strategy

- Connecting multiple data sources across functions.
- Integration of operating technology and information technology networks.

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- Building a sustainable digital ecosystem to replace manual data handling.
- Leveraging data effectively for continuous improvement.

10.3 Business Challenges and Strategic Initiatives

Business Challenges			Strategic Initiatives
DI	SA	ECS	
●		●	1) Digitization of Operational Processes for Business Growth
	●	●	2) Upgrading and Scaling of Technology Systems for uninterrupted Operations
●		●	3) Data-Driven Decision Enablement
	●	●	4) Enhancing Cyber Resilience for Business continuity
DI - Drive Innovativeness		SA - Strengthen Agility	ECS - Enhance Customer Success

10.4 Major TQM Activities

10.4.1 Digitization of Operational Processes for Business Growth

Digitization of Operational Processes focused on systematically digitizing manufacturing operations to eliminate manual dependencies and create real-time visibility across the value chain. By embedding digital tools into daily operational processes, SONA implemented various initiatives in different phases as explained in *Fig.1*. This drives the innovativeness in our digital journey and support in enhancing the customer success. The linkage of each phase with Strategies is also explained in *Fig.1*.

Fig. 1

Evolution of Digitization in Operational Processes

		Strategies				
		1	2	3	4	5
Till F18	**Connected Machines** • Built basic OT/IT connectivity for machines • Standardized connectivity for mixed machine generations		•			
F20	**Integrated Operations** • Manufacturing Execution System • Enabled automated SAP operational postings • Operations line replication in new locations	•		•	•	•
F22	**Digital Traceability** • Scaled part/batch traceability system • Connected processes for end-to-end visibility		•	•	•	
F24	**Intelligence Systems** • Rolled out real time dashboards • Introduced closed loop improvements	•	•		•	
F26	**AI Smart Factory** • AI safety monitoring • Automated Guided Vehicles (AGVs)				•	
F28	**Agentic Operations** • Move Advanced toward agentic lifecycle support • Enabled automation via APIs and orchestration					

Note: 1 - Adopting Technology in Advance, 2 - Future-ready Quality Management, 3 - Meeting Evolving Delivery Requirements, 4 -Building People Capability, 5 - Managing Financial Discipline

Few examples of Integrated Operations on manufacturing execution system are explained below:

a) **Development of TPM Trak**: TPM Trak, an internal in-house developed MES application, provides **Real time Data**, **Dashboards**, **Analytics** and **Reports** for continual improvement in processes. In 'TPM Trak', the production parameters like OEE, downtime, line stoppage, energy consumption are tracked and displayed on Andons. The TPM Trak solution has been **successfully replicated at the Pune plant** ensuring standardization and uniform digital practices across locations.

b) **AR/VR (Augmented Reality/Virtual Reality) based Safety Training**: AR/VR based training was introduced to transform a traditional, classroom-driven fire-safety module into a fully digital, and immersive learning experience. This aid helps in training people without physical set up and so far, we have **trained 161 employees**. By embedding automation and intelligence at every manufacturing process, SONA has set a new benchmark for operational excellence.

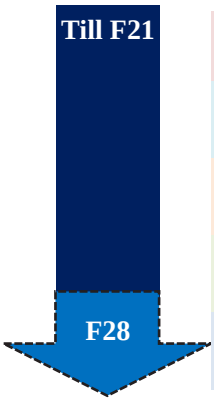


10.4.3 Data Driven Decision Enablement

For enhancing customer success, we need to utilize the captured data and take decisions by analysing the same. Over time, SONA's decision-enablement capability matured through a structured evolution from establishing a Data Foundation to building intuitive Operations Dashboards and progressing into Predictive Insights that forecast risks before they occur. SONA implemented various initiatives in different phases along with linkage of Strategies are explained in *Fig.2*. This enables accurate, insight-driven decisions that enhance responsiveness, reliability, and customer-focused performance across operations.

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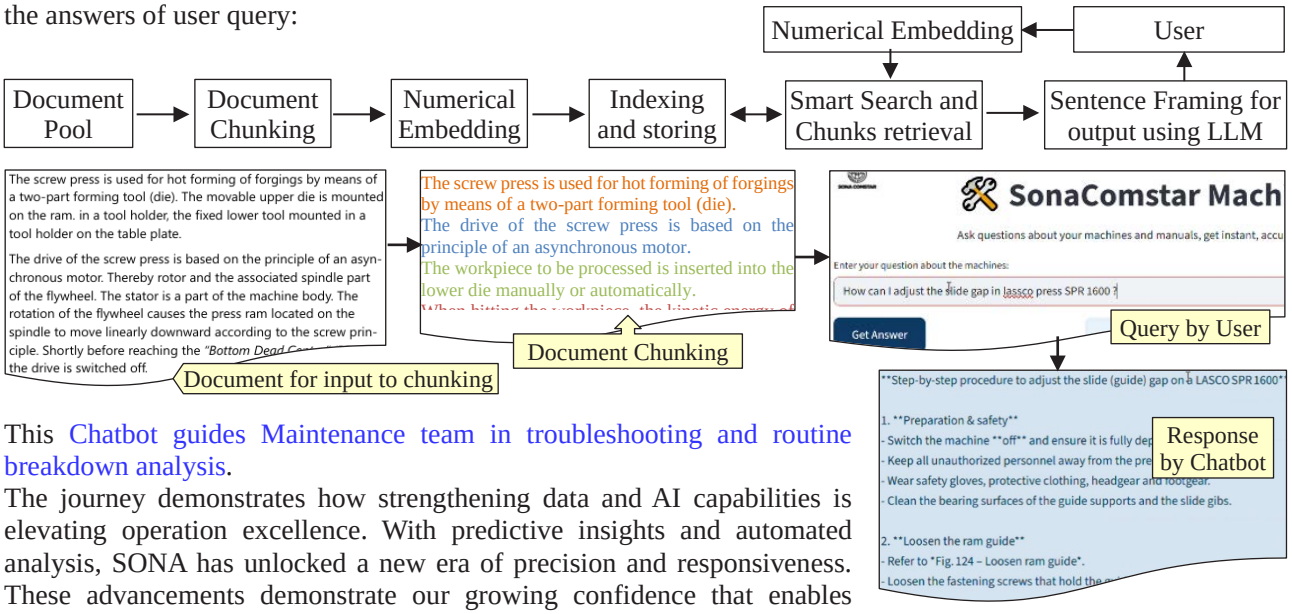
Evolution of Data Driven Decisions Fig. 2



		Strategies				
		1	2	3	4	5
Data Foundation	• Integrated OT/IT data into repositories • Data visibility in standard reports					
Operation Dashboards	• Self Service Business Intelligence enablement • Conversion of reports into Dashboards		•		•	•
Data Insights	• Descriptive Analytics on operational data • Deployment of Predictive Models	•	•	•	•	
AI Decisions	• Gen-AI enabled Chatbots				•	
AI Agents	• Agentic support across value chain (Design to Delivery)					

Note: 1 - Adopting Technology in Advance, 2 - Future-ready Quality Management, 3 - Meeting Evolving Delivery Requirements, 4 -Building People Capability, 5 - Managing Financial Discipline

One of the examples of AI Decisions on '**Gen-AI enabled Chatbots**' is explained below:
To reduce manual effort in troubleshooting and ensure faster access to accurate maintenance knowledge, an **AI-enabled Maintenance Manuals Assistant Chatbot** was developed. This solution helps maintenance team to quickly find troubleshooting steps and machine information. It converts scattered manuals into searchable, structured digital content for instant retrieval. The below process explains the steps followed by Chatbot for getting the answers of user query:



This Chatbot guides Maintenance team in troubleshooting and routine breakdown analysis.
The journey demonstrates how strengthening data and AI capabilities is elevating operation excellence. With predictive insights and automated analysis, SONA has unlocked a new era of precision and responsiveness. These advancements demonstrate our growing confidence that enables customer success.

10.4.4 Enhancing Cyber Resilience for Business continuity

The combination of technological advancements, increased connectivity, evolving cyber threats, and regulatory pressures has made cybersecurity a critical priority for organization. **Business Continuity Plan** (BCP) provides a structured framework for the organization to minimize downtime. We **created Disaster Recovery Sites** in different seismic zones in case of disruption due to any unpredictable circumstances. **Cyber security policies were rolled out in November 2021** and are being reviewed every year. The purpose of these policies is to specify the proper use of IT enabled processes and devices at the workplace.
Till now, we had covered 599 employees in various Cyber Security awareness sessions. With the implementation of above actions, we have improved our **Cyber Posture Assessment Score from 1.5 (F22) to 2.5 (F25)** out of 5 *(Global Automotive industry average is 2.5).*

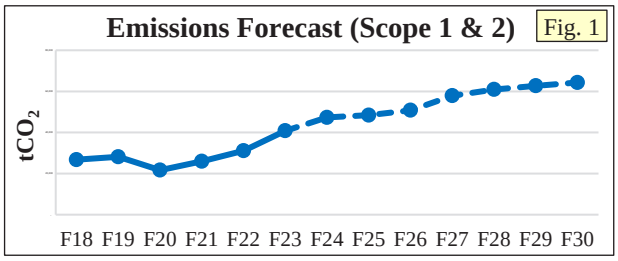
Chapter 11 – Sustainability and CSR

11.1 Overview

SONA BLW is growing at rapid phase which leads to high consumption of natural resources. This has an impact on mother nature. We use natural resources like water, energy and fuels in our manufacturing processes. With increased production, emissions were forecasted in F23, that will reach to 64,332 tCO_2 by F30 as shown in graph (*Fig. 1*).

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We are a purpose-led organization aiming to play a crucial role in accelerating the transition to greener and safer mobility. We are making a positive impact on society through our innovative products and technologies that eliminate or at least, significantly reduce vehicular emissions, improve safety, enhance automation and contribute to a more sustainable planet. We focus on reducing waste, increasing recycling and reusability, improving product durability to preserve natural resources and enabled us in enhancing customer success.



In addition to this, SONA BLW supports society by empowering women, encouraging entrepreneurs, and promoting education. Our Corporate Social Responsibility (CSR) strategy revolves around addressing critical social objectives, which cover areas such as education, access to food and medicine, livelihood enhancement, training programs, and economic opportunities aimed at empowering socially and economically disadvantaged individuals to attain self-sufficiency.

11.2 Challenges

- Ensuring sustainable manufacturing processes.
- Lack of systematic data capturing mechanism.
- Developing culture for near miss reporting.

11.3 Business Challenges and Strategic Initiatives

Business Challenges			Strategic Initiatives
DI	SA	ECS	
●	●		Reduce usage of Natural Resources
	●	●	Creating a Safe Workplace Environment
	●		Community and Social responsibility
DI - Drive Innovativeness		SA - Strengthen Agility	ECS - Enhance Customer Success

11.4 Major TQM Activities

11.4.1 Reduce usage of Natural Resources

Sustainable practices are helping us to reduce the environmental impact by minimizing waste and maximizing water and energy efficiency in processes. We are leveraging modern technologies for sustainable manufacturing processes. To reduce the consumption of natural resources, we have taken the following actions for efficient utilization of energy, water, and raw materials:

Focused Area	Energy / Green House Gas Emissions	Water	Land / Hazardous Waste
Actions taken	· Installation of 4 MW onsite and 18.85 MW offsite solar power plant · **Induction heater efficiency improvement** · Energy efficiency improved by upgrading equipment technology e.g. in Heat Treatment, Seal Quench Furnace (SQF) to Low pressure carburizing (LPC) furnace · Shifted from friction press to direct drive presses (10% more efficient) in Forge Shop	· Improving water efficiency through 5R and water balancing · **Reduce**: Waterless vacuum washing machine introduced · **Reuse**: **Process Waste water into treated water**, RO reject water used for flushing in urinals · **Recycle**: Sewage waste, Effluent waste, Die lube waste · **Recover**: AC drain water collection	· Installation of die lube treatment plant · Grinding sludge briquetting · Recyclable packaging · Landfill waste is pre-processed through authorized agency and used as raw materials for other industries
Results	**Green Energy share improved** about 30%. Emissions reduced by 12% till F26.	**Specific water consumption reduced** by 50% till F26.	**Zero Land-fill Waste generation**.

From the above actions, two initiatives are explained below in detail:

a) Improving Energy Efficiency in Forge Shop:

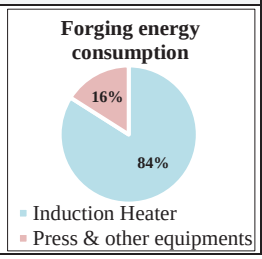
Forging process is an energy intensive process. Energy is used for heating the billet and forging the parts. Improving energy efficiency directly affects carbon emissions and operational costs. We have implemented various projects for improving efficiency, few are listed below:

a) Induction heater efficiency improvement
b) Billet vs coil diameter adherence

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c) Upgradation of Demineralized water pump from IE2 to IE5 *(IE – International Efficiency)*
d) Reduction of black billet discard by program logic modification

As an example, one of the projects on '**Induction heater efficiency improvement**' is explained below:

Background	Actions taken and Result achieved
• Induction heater consumes 84% of energy in forging to heat the billet. • Capacitor stores and generates power, currently having 2 capacitors of 200 µF each. 	• Induction heater's function and working principle studied for design modification to reduce capacitance • Coils modified by increasing the number of turns to increase Inductance • Induction heater **specific energy consumption reduced by 20%**.

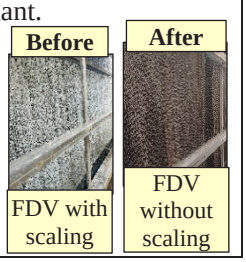
Similarly, we have implemented other actions in Forging which have resulted in reduction in specific energy consumption by 27%.

b) Improving Water Efficiency:

Underground water is depleting rapidly in Gurugram region by 17 meters in 9 years (26 meters in F14 to 37 meters in F23). Water efficiency becomes critical in these circumstances. We have implemented various projects for improving water efficiency. Some of the projects are listed below:

(a) Installation of Die lube treatment plant (DLTP)
(b) Zero Liquid Discharge (ZLD) set up installation
(c) Using treated water in Cooling Tower and Forced Draft Ventilation (FDV)

One of the improvement cases of '**Using treated water in Cooling Tower and FDV**' is explained below:

Background	Actions taken and Result achieved
• Till F25, we used to feed Cooling tower and FDV with fresh water having water TDS 700 – 800 ppm. • TDS creates scales and salt layers on cooling pads of cooling tower and FDV. • To improve cooling efficiency, sump water is discarded on weekly basis, and cooling pads require washing daily. This adds to **frequent water discarding** and resulted in **high fresh water consumption**.	• Process waste water converted to treated water (DM water) in waste water Treatment Plant. • The treated water used in Cooling tower and FDV instead of freshwater. This resulted in **8% saving in water consumption** and cooling pump **motor breakdown eliminated** due to no scales. 

Similarly, we have implemented other actions across plants which have resulted in reduction in specific water consumption by 50% till F26.

11.4.2 Creating a Safe Workplace Environment

A safe workplace is the foundation of a high-performance resilient, and sustainable organization. The work environment has a direct influence on the productivity, health, and well-being of everyone involved in the manufacturing process. A safe workplace not only protects people but also contributes to a more sustainable and environmentally responsible business model, we are doing following activities to create a safe workplace environment:

Focused Area	Air Quality	Noise	Workplace Safety
Actions taken	• Fume and dust collectors installed in various areas • Phytoremediation in die shop • Retrofit Emission Control Device (RECD) installed on Diesel Generator sets • Overhead cables moved to underground from Grid to plant • Diesel generator converted to dual fuel (Diesel + CNG)	• Canopy installation on shearing billet cutting machines • Acoustics chamber installed in Diesel generators • Anti-vibration pads installed under forging press • Rubber mats fitted on hoppers of billet loaders	• Real time monitoring of PPE adherence using video analytics in Raw Material Store at Gurugram • Improved Near miss reporting mechanism • Developed Forklift training module and trained drivers • Conducted Driver safety training for internal and supplier drivers • Regular health checkup for employees • Installed Automated External Defibrillator (AED)

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Results	• Tool and Die shop CO ppm improved • 60% reduction in PM 2.5 and NOx from Diesel Generator	• **Noise level reduced** in **Diesel Generator area**	• **Zero accident** in billet cutting area since F24 • **100% forklift drivers trained** for safe operation of forklift. • **~ 45 design changes** after near miss analysis

11.4.3 Community and Social Responsibility

Our Corporate Social Responsibility (CSR) strategy centres around sustainability through innovation, education, especially women's education, providing livelihood support through skill development programs, plantation and creating opportunities for those who are socially or economically marginalised.

Through our CSR initiatives, we are committed to creating meaningful and measurable social impact. We actively contribute to women empowerment, support and nurture the startup ecosystem, and promote educational opportunities for underprivileged sections of society.

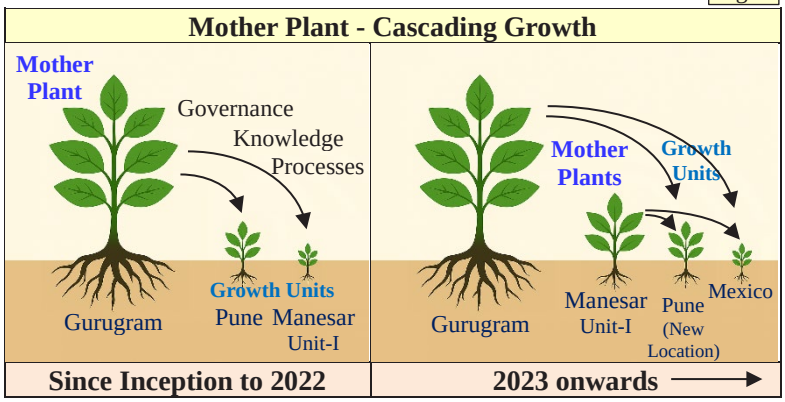
The below table summarizes the key activities undertaken:

Focused Area	Women Empowerment	Supporting Entrepreneurs	Promoting Education	Social campaigns
Activities done	• Promoting education for women scholars in STEM (Science, Technology, Engineering and Math) subjects at Ashoka University. • Developing infrastructure of local government schools.	• Construction of floor for innovation at IIM-Ahmedabad	• Made classrooms as Digital smart classes. • Installed solar power plant (capacity 10kWp). • Renovation of classrooms and washrooms at government schools.	• Tree plantation using Miyawaki technique • Organized voluntary Blood donation camps • Road safety awareness programs
Result	• **14 scholarships** to women scholars. • 8% increase in women student enrolment.	• **13 startups** are supported and funded. • 6000+ innovators/ entrepreneurs benefitted by incubation space.	• 925 children and 32 teachers in Govt. School provided potable water and digital learning aids.	• 68,767 trees planted. • 164 units of blood collected in last 3 years. • 700 people covered in road safety campaign.

Chapter 12 – Mother Plant - Cascading Growth

12.1 Overview

Fig. 1



During the rapid expansion, SONA BLW set up manufacturing units. This required transfer of knowledge, processes, and governance. We have evolved a structured approach over this period to develop new manufacturing units. The 'Mother Plant - Cascading Growth' describes the model in which one relevant mature core entity acts as a capability hub, systematically cascading processes, knowledge, and governance to a new unit. This enables setting up, scaling growth while maintaining consistency, quality, and control. The model focuses on creating units that can enable them to evolve towards operational self-sustenance and excellence while remaining aligned to the central strategy.

12.2 Need for a Mother Plant Approach

As business is continuously growing and needing setting up of new units, we need a systematic approach that enables setting up, scaling, and monitoring them for alignment with organizational priorities. We evolved the Mother Plant Cascading Model (*Fig. 1*). This model ensures that every new or expanding unit begins with required capabilities that will enable them to grow and excel.

This model has been transformed into a structured framework over a period of time which is described later. This approach has helped the newer units to be able to fulfil customer's requirements learning from the parent unit and achieving faster operational maturity. The implementation of proven flow, standardized manufacturing practices and experiential learning help newer units to overcome start up challenges and stabilize quickly.

Ongoing reviews and guidance ensure timely decision-making and alignment. Maneasr, Pune (Chakan) and Mexico have been set up with this methodology over a period of time.

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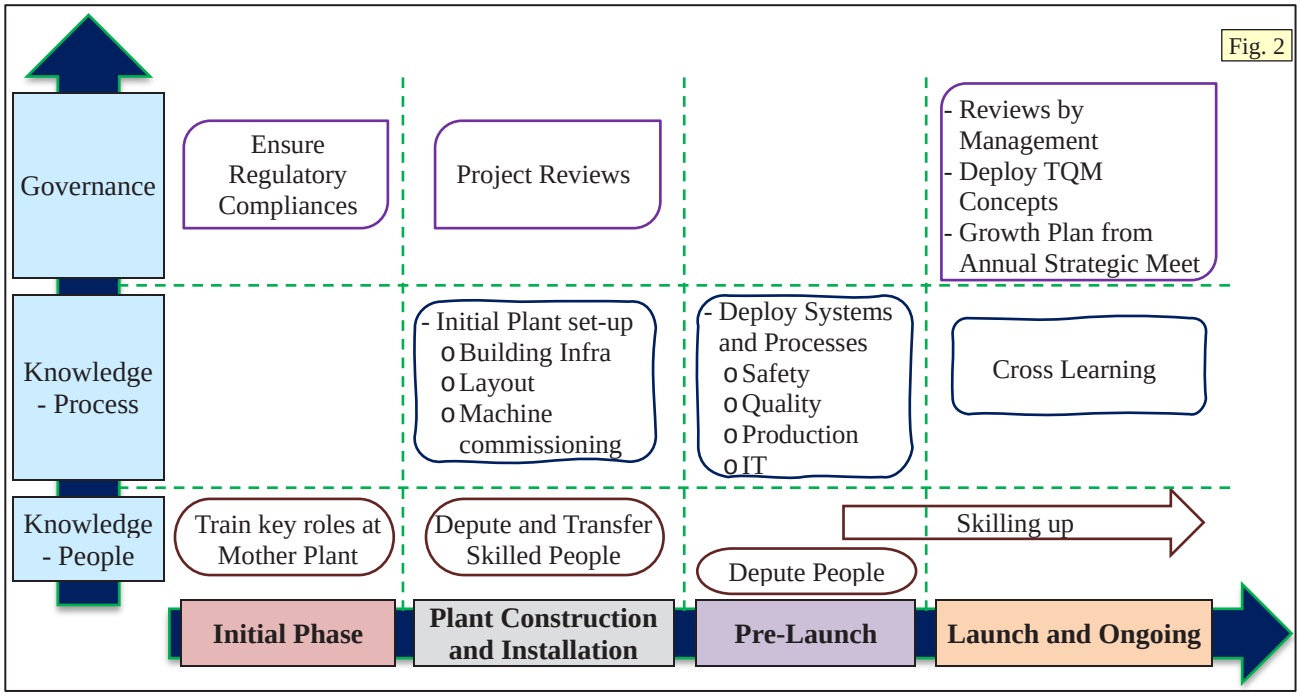
12.3.1 Support from Gurugram to Manesar Plant

In 2019, we set up a new plant at Manesar for manufacturing Differential Assemblies for EV customers. This plant is equipped with the latest technology and infrastructure to meet stringent and evolving quality requirements. We identified existing talent and developed them in-house for new roles in engineering, testing, validation, tooling, production, quality, and other core functions. The talent was developed through focused training programs, training at machine manufacturers and customer interactions.

- A core team of **five critical talents** was formed in 2018 to work on product design, Engineering, and prototype development.
- **Four Leaders** who were certified under the Visionary Leaders for Manufacturing (VLFM) program were developed for business and functional head roles.
- Between 2019 and 2020, 25 employees were trained for new roles in Engineering and Production.
  With the pre-development of talent in-house, we were able to set up the plant in 9 months and **start supplying Differential Assemblies in 11 months**. We have developed and transferred 65 employees to meet the growing customer demand and production requirements.
- Gurugram plant team helped in selecting the plant architecture, managing fabrication work, shifting machines from Gurugram, and commissioning the new plant.
- Regulatory Compliance requirements were shared, and timely implementation was ensured.
- Deployment of Safety systems, Quality systems and Production processes.
- The IT team contributed by deploying TPM Trak, implementing Industry 4.0 projects, setting up centralized data management, and installing essential applications and infrastructure.

From these learnings, we have developed a framework and applied during set up of new plants in Pune and Mexico. The framework is shown below:

Fig. 2



12.3.2 Support from Manesar to Mexico Plant

The Manesar team played a crucial role in supporting the Mexico plant by deploying a dedicated group for plant design, project execution, machine commissioning, and production activities.

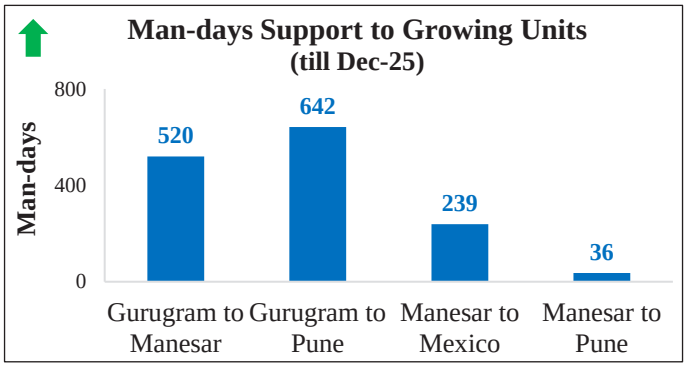
Initial Phase	• Ensured the fulfilment of all regulatory compliances at a newer geography.
Plant Construction and Installation	• Deputed 2 employees to Mexico to support the successful erection of the plant building. • Project team helped in selecting the plant architecture, managing fabrication work and shifting machines from Manesar. • Assisted with process design, equipment and layout finalization, and the sharing of standard practices across plants. • Regular project reviews by management (spent 49 man-days).
Pre-Launch	• Deputed 11 employees to Mexico (spent 190 man-days). • Handholding in proving out the metrology and metallurgy equipment.

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	• Deployment of quality systems, inspection standards and gauges. • Deployment of Safety and IT systems. • Support in customer audits. • Transferring 3 employees by Dec-26 for 3 years to strengthen the systems and processes.
Launch and Ongoing	• Production yet to start. • Deployment of TQM concepts.

The **directive from the Annual Strategic Meet** (*Uday*) to **establish a plant in Mexico** for meeting North American customer requirements was **executed flawlessly**. This was **achieved by following the cascading framework, irrespective of regional barriers**.

After implementing the framework at the Mexico Plant, we identified the need to include the 'adaptation of documents into the local language', which has now been incorporated in the framework.
Through systematic cascading of knowledge, processes, and people capability, the Mother Plant has significantly strengthened all growing units. The Mother Plant model has enabled seamless cascading of expertise, providing over 1,437 man-days of direct support to growing plants.

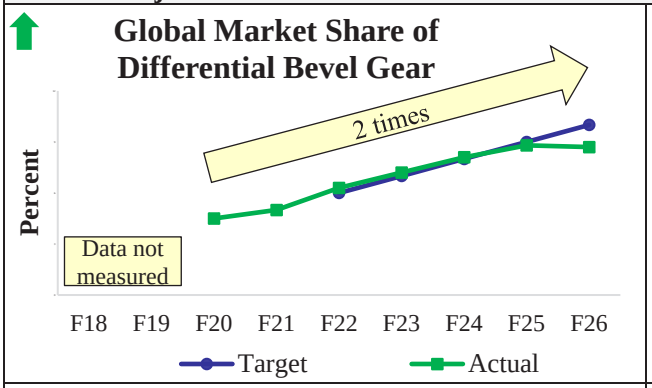


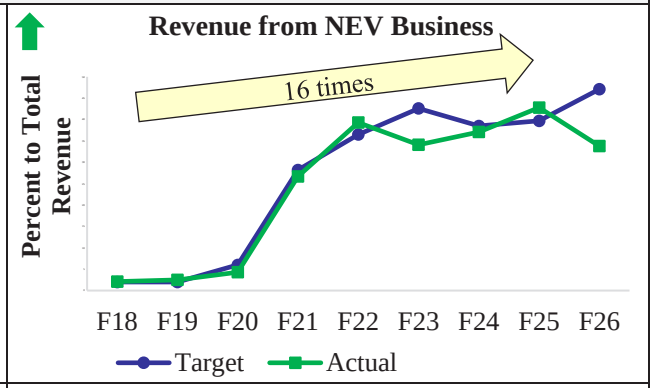
Chapter 13 – Effects of TQM and Future Plans

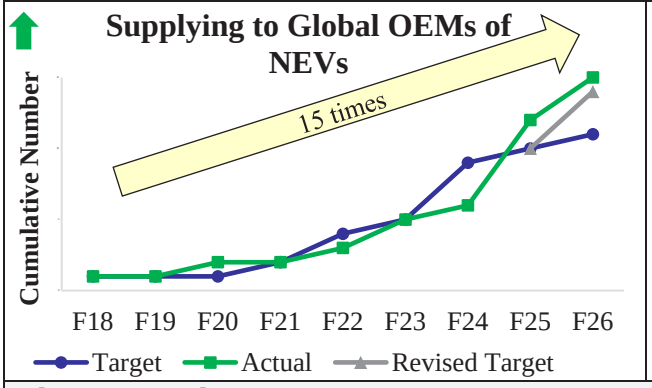
TQM is helping SONA BLW in achieving the Business Objectives and realizing the Vision. We achieved significant improvement in performance parameters against the stretched targets. The culture of TQM is spread across the organization, resulting in improvement in process performance (PQCDSM). Involvement of employees in improvement activities shows the acceptance of this culture throughout the organization.

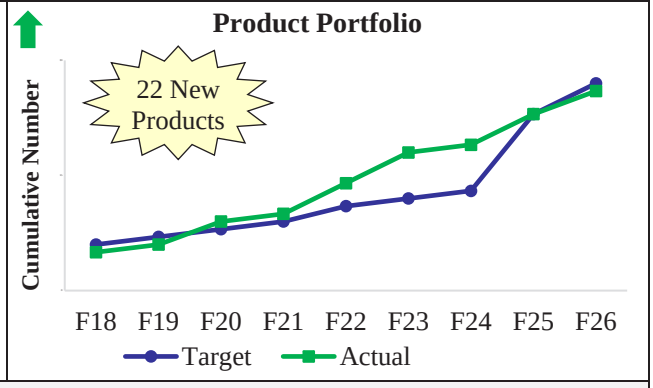
13.1 Effects – Business Objectives and Other Key Results

Business Objectives



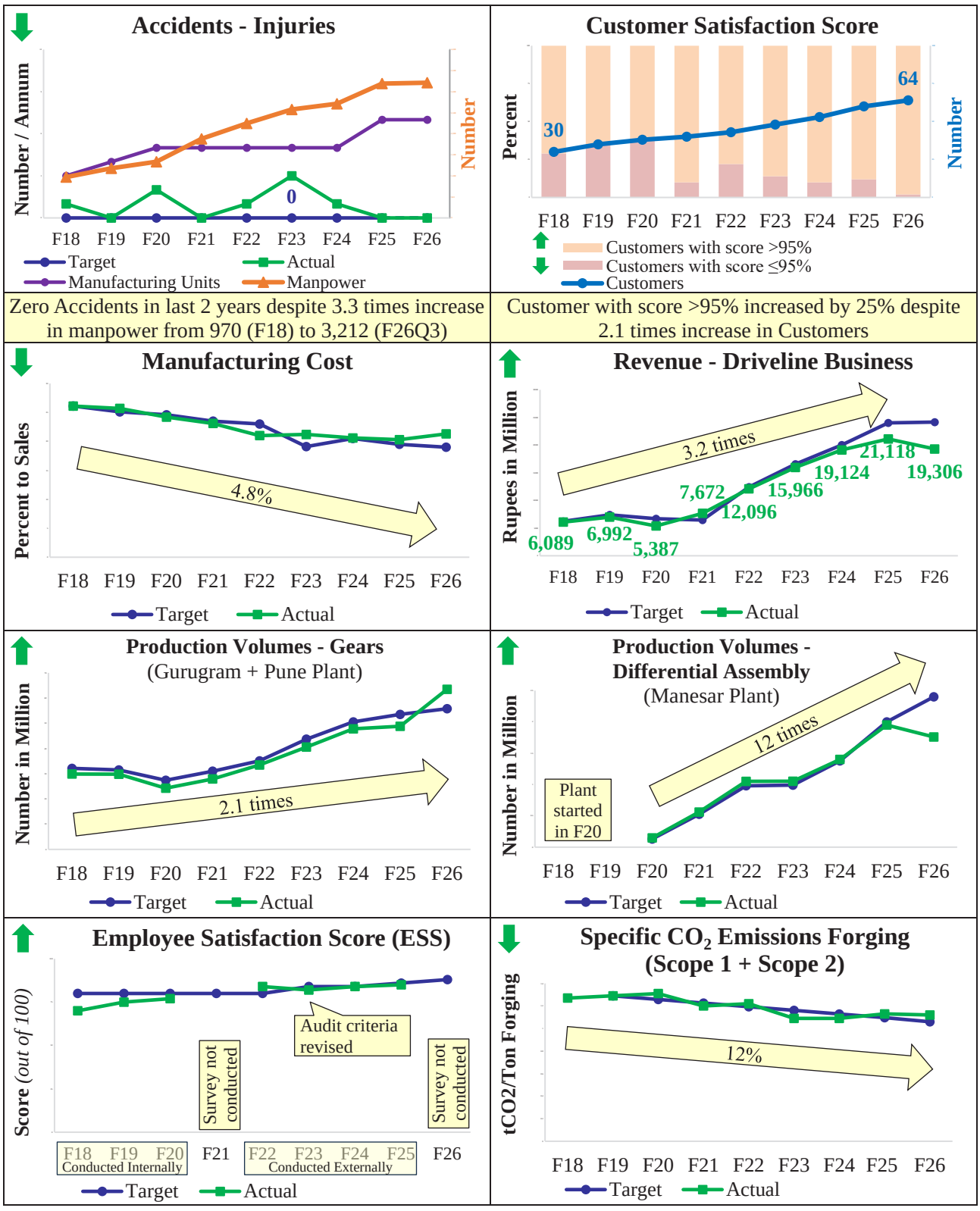






Other Key Results

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13.2 Future Plans to Achieve Vision and Further Strengthening TQM

- Continue leveraging TQM for realization of Vision and Customer oriented Business Objectives, Strategies.
- Institute a mechanism to measure the implementation status and achievement levels of the Strategies
- Deployment of TQM Strengthening Master Plan that identifies the organizational capabilities necessary to achieve the 2030 Long-Term Goals
- Annual assessment for effectiveness check of TQM tools deployment across locations covering all departments.
- Strengthen QCC culture in newer plants.
- Further strengthening of New Product Development process based on learning from past projects.

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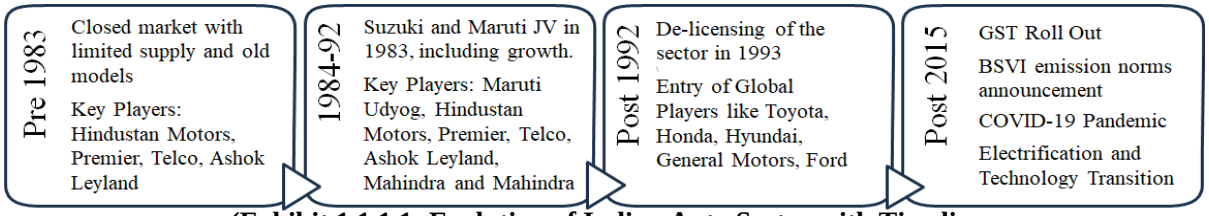
デミング賞
受賞報告講演要旨

Tata Toyo Radiator Limited

1. Outline of the Organization

1.1 Background

1.1.1 Automotive Industry in India: In FY25, the Indian auto industry is world's third largest by annual production at US$ 250 billion with an expected 8-10% year-on-year growth. The automotive industry is a pillar of the Indian economy and a key driver of macroeconomic growth and technological advancement. The evolution of Indian auto sector is captured in **Exhibit 1.1.1.1**



(Exhibit 1.1.1.1: Evolution of Indian Auto Sector with Timeline

1.1.2 Auto Component Industry in India: Automotive Components Manufacturers Association (ACMA) has helped to build a robust industry which serves the growing domestic market as well as export market. Over the last two decades, several initiatives launched by government have further helped to reinforce the position of Indian auto component industry. The size of the auto component industry is as shown in **Exhibit 1.1.2.1**

Overview of the Indian Auto Component Industry (FY19-25) *(All figures in US Dollar in Billion except percentage)*			
	FY19	FY25	CAGR% (FY19-25)
Total Turnover	57.1	80.2	5.83%
Export	15.2	22.9	7.07%
Import	17.7	22.4	4.00%

(Source- https://www.acma.in/

Exhibit 1.1.2.1: Overview of the Indian auto component

1.1.3 Organization Description.

Tata Toyo Radiator Ltd.: Tata Toyo Radiator Ltd (TTR) was established in 1998 to manufacture and supply aluminum radiators to OEMs in India. TTR is an independent company formed through a joint venture between Tata AutoComp Systems Limited (TACO) and T. Rad Co. Ltd, Japan with equity of 51% and 49% respectively as on FY26. Currently, TTR caters to a wide range of customers across automotive (CV, PV, 2W) and non-automotive (tractor and diesel generator) segments. TTR caters to domestic as well as export markets without any conflict/competition with the JV partner's overseas business. Over the years, TTR has expanded its product portfolio to provide complete Engine Cooling System solutions for Internal Combustion (ICE) engines in addition to heat exchangers required for Cabin ventilation and air conditioning (HVAC) systems. To address emerging market trends, it has started development and supplies of heat exchangers for all types of electric vehicles (EV) as well. Broadly, TTR product portfolio is categorized into 2 verticals, i.e. Powertrain Systems (ICE and EV) and HVAC Systems.

Brief about Joint Venture Partners:

Tata AutoComp Systems Ltd: Tata AutoComp Systems Ltd. was established in 1995 to bring auto component technologies into India to serve Indian Auto Industry. Tata AutoComp Systems Ltd. is in the business of design, development, manufacturing & supply auto-component products & services. It operates through its own Divisions, Subsidiaries and Joint Ventures (JV). Each one of these is called a Business Unit (BU) and has 22 business units with 68+ plants including 13 overseas plants.

T.RAD Co. Ltd: T.RAD Co. Ltd, formerly known as Toyo Radiator Co. Ltd. was founded in 1936 in Japan and renamed itself as T.RAD Co. Ltd in year 2005. It designs, manufactures, and sells heat exchangers in domestic and overseas markets. It is a leading heat exchanger manufacturer in Japan having sales revenue of over US$ 1 billion with 16 manufacturing plants globally (includes JVs and subsidiaries) and 3 R&D centers in Japan, US and India.

1.2 Vision, Mission and Core Values

Vision and Mission: TTR has evolved its vision and mission based on inputs from its JV partners. TTR's current vision, mission and core values are as follows. **Exhibit 1.2.1** (last revised in FY22):

Vision	By 2027, TTR will be number 1 supplier in India by heat exchanger quantity by addressing changing needs of industry and exceeding customer expectations.
Mission	To provide best in class heat exchange solutions for the betterment of society, preservation of environment while delivering value to all stake holders.

Core Values: TTR's core values are the principles and priorities that guide TTR's actions.

Core Values				
Integrity	**Excellence**	**Pioneering**	**Responsibility**	**Unity**

Exhibit 1.2.1: Vision, Mission and Core Values

1.3 TTR Business Model: TTR business model centers around business development, in-house designing, proto-typing, testing, manufacturing and supply of heat exchangers to ICE, EV and HVAC applications. TTR products are designed and developed based on customer technical inputs to deliver lightweight high performance and reliable products. Support functions like Quality, Finance, IT and HR drive functional excellence to meet customer needs.

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1.4 Market Segment: TTR is present in automotive (CV, PV, 2W) and non-automotive (Tractor and DG) segments. The CV segment is further sub segmented into Medium & Heavy (MHCV), Light (LCV) and Small (SCV). In addition to domestic market, TTR is considering increasing sales from export market. TTR also supplies to aftermarket and OE spare parts.

1.5 Products and Customers: TTR supplies various powertrain and HVAC products like radiators, intercoolers, heater cores, condensers, oil coolers, evaporators, exhaust gas recirculation (EGR) coolers, engine cooling systems (ECS), radiator fan motor shroud (RFM), condenser, radiator fan motor shroud (CRFM). TTR is expanding its product range for EV applications by introducing new products.

1.6 Manufacturing Capabilities: TTR has capacity to manufacture 10.1 million heat exchangers as of FY26. TTR has strategically set up manufacturing and assembly plants near to customer locations to offer value proposition. It has 08 plants in India and operates 02 warehouses, one in India and other in UK (**Refer Exhibit 1.6.1**). TTR uses T. RAD Japan made manufacturing equipment. TTR has enhanced its manufacturing capabilities with advanced technologies. The adoption of Industry 4.0, Manufacturing Execution Systems (MES), and AI-based defect detection reflects TTR's continuous improvement and digital transformation journey.

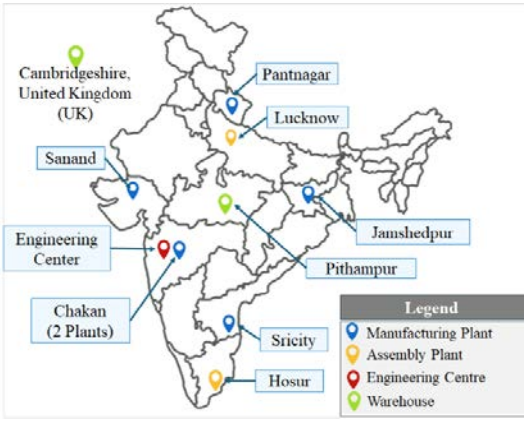


Exhibit 1.6.1: Plant and Warehouse Location

1.7 Engineering Capabilities: All TTR products are designed, developed, tested, validated, and manufactured in-house. TTR has a dedicated engineering center in Pune and is the first heat exchanger manufacturer in India with an ISO/IEC 17025 NABL-accredited product testing and material technology laboratory. Continuous upgrades in engineering capabilities have enabled TTR to deliver reliable, sustainable, and lightweight products meeting evolving industry regulations and customer demands. TTR is further strengthening its capabilities for future applications.

1.8 Organization Structure: The organizational structure of TTR is illustrated in **Exhibit 1.8.1**. TTR is led by the CEO, who reports to TTR's board of directors. The board comprises Directors from Tata AutoComp Systems Ltd., and T.RAD Co. Ltd, Japan. Our organization benefits from a predominantly young workforce, with 63% employees below 30 years age. TTR have a well-qualified staff with professional and technical degrees, ensuring a balanced blend of fresh talent and skilled expertise to drive operational excellence.



* Employee count including CEO. Employee with shared responsibilities (3 Nos.) counted in respective departments

Exhibit 1.8.1: Organization Structure as on 31st May'2026

1.9 Certifications: TTR has continuously improved its management systems by standardizing processes and systems, thereby establishing a strong foundation. **Exhibit 1.9.1** represents the external body and customer certifications that demonstrate the sustenance of these management systems.

External Body Certifications	**Year**	**Category**
ISO14001:2015 Environment Management System	2013	Safety
ISO/IEC 17025	2016	Testing Laboratory
ISO 45001:2018 Safety Management System	2016	Safety
IATF16949:2016 Quality Management System	2018	Quality
ISO 27001: 2022 Information Security Management System	2024	Information Security
Customer Certifications	**Year**	**Category**
MSA (TML)- Q	2016	Quality
Renault Nissan: ASES-Q	2016	Quality
Stellantis – NSA -Q	2020	Quality
MSES (Mahindra Supplier Evaluation Standard-B)	2025	Quality
JLRQ Certification	2025	Quality

Exhibit 1.9.1: Certifications-Customers and External Bodies

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1.10 Rewards and Recognition: TTR endeavours to build long-term partnerships with its customers, and its efforts to deliver value have been recognized through various awards and accolades. To encourage employee involvement in improvement activities, TTR promotes participation of both on-roll and off-roll employees in international, national, and regional-level competitions organized by professional bodies such as QCFI, CII, and ACMA, as well as its JV partners. Recent customer awards have been received from Toyota, Tata Motors and KOEL. **Exhibit 1.10.1** represents major recent awards.

Year	Customer Awards	Geography
2026	KOEL Pune EHS–ESG Contest- *Gold Award*	National
2025	Mahindra Powerol QC Story Competition - *Runner Up*	National
	Tata Motors- L2 & L3 Controls Implementation- *Runner Up*	National
	Toyota Kirloskar Supplier Association QCC- *Runner Up*	National
Year	**External Forum Awards**	**Geography**
2026	ICQCC – *2 Gold awards*	International
	NCQC – *4 Excellence awards & 1 Par excellence award*	National
	ISQ Advanced QC Story Competition – *Winner*	National
2025	ICQCC – *2 Gold awards*	International
	ACMA QC Competition – *3rd Position award*	National
Year	**JV Partner Awards**	**Geography**
2026	All T.RAD QC Competitions- *Winner*	International
	Tata AutoComp QCC Competitions – Winner	National
2025	All T.RAD QC Competitions- *Runner Up*	International
	Tata AutoComp QCC Competitions -*Winner*	National

Exhibit 1.10.1: Recent major awards from customers and external forum

1.11 Corporate Social Responsibility (CSR): TTR's CSR efforts have strengthened government schools and nearby communities through improved infrastructure, hygiene awareness, and well-rounded education in arts, sports, and yoga. During MTP3, TTR expanded CSR initiatives from 2 in MTP1 to 5, while volunteering hours per capita increased from 2 hours in MTP1 to 12 hours in MTP3, thereby building strong community trust and a scalable CSR model across locations.

1.12 Environmental Social Governance (ESG): TTR embedded ESG into its TQM-driven growth strategy through a cross-functional roadmap focused on energy efficiency, clean fuels, and renewable energy adoption. These initiatives reduced energy consumption from 1.92% to 1.23% of sales, lowered GHG intensity to 6.40 tCo2/Sales in FY26, and established Chakan as a benchmark with 3.5 MW solar at regulatory limits. TTR's leadership was recognized with the Gold Award at the ESG Contest 2026 by KOEL reinforcing its position ahead of competitors and commitment towards advanced ESG.

2. Business Objective and Strategies

2.1 Background: TTR revised its vision (**Refer Exhibit 1.2.1**) in FY22 to become no. 1 company by quantity by FY27. To achieve this TTR needs to grow domestic business as well as export business. For domestic business TTR plans to grow in passenger vehicles, 2-wheeler and tractor segments where TTR is having low market share. For export business growth, TTR plans to work on opportunities without competing with JV partners. TTR products are linked to emission regulations. With tightening emission norms, customers require increased heat dissipation without increasing weight and size of heat exchanger. TTR continues to innovate and develop new technology products which exceed customer expectations. As the industry shifts from ICE to EVs, it has created additional business opportunities for TTR as EVs need more heat exchangers. Accordingly, TTR has started developing new green sustainable products specific for EVs and introduced several first-in-India EV products. TTR is aiming to establish itself as EV heat-exchanger technology leader in India. As TTR business expands domestically and globally, TQM is the key enabler to meet business objectives and achieve the vision. TTR continues to innovate to meet customer expectations.

2.2 MTP 1| FY19-21 | TQM Introduction Phase: Before adopting TQM, TTR used the Balanced Scorecard (BSC) to track business and functional goals, focusing mainly on financial metrics with inadequate focus to customer and quality. After TQM introduction, TTR set its vision and mission in FY19 and introduced policy management in FY20 to set business objectives and strategies.

2.2.1 Remaining Issues from MTP-1:

- Customer Rejection PPM not met
- Customer milestone (PPAP) timeline adherence not met

During MTP1, the BS4 to BS6 transition on 1st April 2020 and the COVID-19 lockdown in March 2020 impacted auto industry. As a result, both customers and TTR experienced severe impacts on their business operations. TTR could not achieve sales and profitability targets, necessitating a revision of MTP targets for net sales and revenue.

2.3 MTP 2| FY22-24| TQM Establishment Phase

2.3.1 Vision and Mission

Post pandemic, as Indian economy began normalizing, growth was expected across automotive and non-automotive segment. TTR revised its vision based on the inputs from its joint venture partners. It has helped TTR bring alignment across organization to achieve required business growth by FY27. Since TTR is market leader in India in terms of revenue, the vision was formulated to achieve the position of market leader in terms of quantity by FY27.

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TTR's Vision and Mission:

Vision	By 2027, TTR will be number 1 supplier in India by heat exchanger quantity by addressing changing needs of industry and exceeding customer expectations.
Mission	To provide best in class heat exchange solutions for the betterment of society, preservation of environment while delivering value to all stake holders.

2.3.2 Vision, Mission and Business Objectives Linkage: To realize organization's new vision, TTR's objectives were redefined as shown in the table below **Exhibit 2.3.2.1.**

Vision	Business Objectives -KPI		Mission	Business Objectives - KPI
No. 1 Supplier in India by quantity	Net Sales		Best in Class heat exchanger Solutions	Internal Rejection/ Scrap
				Warranty Failure- 18 MIS
Changing needs of industry	New Products Development			IPRs generated
	Adherence to Technology Road Map		Value to all stake holders	Lost Time Incident
Exceeding Customer Expectations	Customer Rejection (PPM)			Sustainability Parameters not achieved Target
	Customers Rating Criteria Not Met			Employee Involvement
	Customer milestone (PPAP) timeline adherence			EBITDA

Exhibit 2.3.2.1 Vision, Mission and Business Objectives Linkage

2.3.3 Major Issues, Challenges and Key Strategies. In MTP2, TTR faced below issues and challenges, and strategies were formulated to address them. (**Refer Exhibit 2.3.3.1**)

Major Issues/Challenges	Strategy
Higher Customer Rejection	• Reduction of customer rejection using QC Story approach and through Customer Value Management. • Improving inspection methods to reduce defect-outflow to customers using Vertical Evaluation.

Exhibit 2.3.3.1: Major Issues, Challenges and Key Strategies for MTP2

2.3.4 In MTP2, TTR implemented Four Student Model (FSM) to evaluate business objectives and strategies. Objectives were refined based on key focus areas of the vision, while some continued from MTP1. The business objectives and strategies for MTP2 are outlined in the truncated table below (**Refer Exhibit 2.3.4.1**).

Key Focus Area from TTR's Vision	Objective	KPI *(UOM)*	Strategies	KPI *(UOM)*	FSM Type
Exceeding Customer Expectations	Improve customer Satisfaction	Customer Rejection *(PPM)*	Rejection reduction: Customer 1 • Problem-solving QC Story • Komatsu flag system • Customer value management	Customer Rejection Customer 1 *(PPM)*	C
			Rejection reduction: Customer 2 • Inspection improvement • Problem Solving QC Story	Customer Rejection Customer 2 *(PPM)*	C

2.3.5 Remaining Issues

- Customer rejection target not achieved
- Internal rejection target not achieved

2.4 MTP 3| FY25-27| TQM Consolidation Phase

2.4.1 Formulation of MTP 3: After TQM Diagnosis, TTR applied key learnings to revise its policy management process flow (**Refer Exhibit 3.7.1.1**) and to revisit the formulation of MTP3. Following inputs were used while revising MTP3:

1. New business objectives were added to improve linkage between the vision, mission, and existing objectives (Refer 2.4.1.1).
2. Learnings from MTP2 were reviewed using FSM, which helped identify remaining issues (Refer 2.4.1.2).
3. Learnings from TQM Diagnosis were identified and input taken in MTP3 revision process. (Refer 2.4.1.3).
4. External challenges and growth opportunities were identified through VOC, PESTLE, competitive positioning analysis, and SWOT (Refer 2.4.1.4).

Based on these inputs, strategies were developed to address the identified issues and challenges. These business objectives and strategies were subsequently cascaded from BU level to next working levels through the catch-ball process.

2.4.1.1 Vision, Mission and Business Objective Linkage: Based on the learnings from the TQM diagnosis, TTR revisited and strengthened linkage between its vision, mission, and business objectives. (**Refer Exhibit 2.4.1.1.1**)

Vision Element	Business Objectives KPI		Mission	Business Objectives KPI
	Market Share in Heat Exchanger			Customer Rejection

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No. 1 Supplier in India by quantity	(In terms of quantity)		Best in Class heat exchanger Solutions	First Pass Ratio
	Net Sales		Betterment of Society	***Gender Diversity**
Changing needs of industry	New Products Developed			CSR Per capita volunteer hours
	***Digitalization Road Map Adherence**		Preservation of Environment	ESG Score
Exceeding Customer Expectations	***Performance to weight ratio**			GHG Emission
	Key Customers (by revenue) giving Top Rating		Value to all stake holders	Employee Engagement Score
	Offering extended warranty to CV Segment (From 18 MIS to 36 MIS)			***% of competency gap closure**
	***NPD Time to Launch**			***Direct employee with skill>L2**
				EBITDA
Legend	***Objectives**	New Business Objective added based on TQM Diagnosis feedback		

Exhibit 2.4.1.1.1: Vision, Mission and Business Objective Linkage

2.4.1.2 Learnings from MTP2: Business objectives and strategies in MTP2 were reviewed using the FSM, and learnings were carried forward into MTP3. Key learnings from remaining issues (Refer 2.3.5) are summarized below:

- Customer Rejection: Child parts (supplier related) and process were top contributors.
- PPAP milestone delays, as unresolved points from earlier NPD gates continued to flow into PPAP, affecting timeline adherence.
- Internal Rejection: Risk mitigation plan for power backup to vacuum brazing furnace to be considered for processing special grade Stainless steel products.

2.4.1.3 Learnings from TQM Diagnosis feedback:

TQM Diagnosis Feedback	Learnings	Actions taken
Increase Gender diversity (female employee)	Overall organisational focus on gender diversity needs to be improved.	• Included as key objective in the business plan. • Create an inclusive work environment • Career development plan for female employees.
Accelerate the promotion of digitalization.	There is a scope for implementing digitalisation through development of structured process and plan.	• Organization wide digital roadmap developed. • A cross-functional governance created to promote digitalization.

2.4.1.4 Strategies to achieve Vision: In MTP3, growth in passenger vehicles, commercial vehicles, 2-wheelers, EVs and export market. To achieve FY27 vision, TTR analyzed potential opportunities in both domestic and export markets.

2.4.1.5 Export Market: The global growth in EVs created an opportunity for TTR to expand its EV product range and grow its export business. To achieve this, TTR identified export opportunities and TTR developed following strategy to grow export business (**Refer Exhibit 2.4.1.5.1**)

Segment	Strategy	Capability Required
Export	Export Growth through Product Development and Manufacturing of New-Generation Heat Exchangers	• Design and manufacturing capabilities • MES (Manufacturing Execution system)

2.4.1.6 Domestic Market: In MTP3, TTR identified market segment-wise growth opportunities in passenger vehicles, commercial vehicles, two-wheelers and tractor segment. TTR identified strategies to grow these market segments. (**Refer Exhibit 2.4.1.6.1**)

Segment	Strategy	Capability Required
Passenger Vehicle	Add new customers Add new products	Design, testing and manufacturing capabilities for new product
Commercial Vehicle	Increase Radiator market share in commercial vehicle segment by Offering extended warranty life	• Product Testing using RLDA • Analytical capability

2.4.1.7: EV Application: To cater to the changing needs of customers for EV application following strategies are adopted (**Refer Exhibit 2.4.1.7.1**)

Application	Strategy	Capability Required
EV	Add new customers Add new products	Design, testing and manufacturing capabilities for new technology

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2.4.1.8 Strategies to address remaining issues (Refer 2.3.5):

2.4.1.8.1 Customer Rejection: To prevent the defect outflow to customers and to prevent defect generation, following strategies were formulated:

- Shift defect detection to earlier stages by deploying GDAD matrix and enhancing inspector capability.
- Conversion of L1 to L2/L3 process controls critical processes.
- Variation reduction through process stability and capability improvement of SC/CC parameters.
- Improve design and development process for manufacturing process.
- PDCA in supplier part development and supplier PPAP process.

2.4.1.8.3 Internal Rejection/Scrap: To reduce the internal rejection, following strategies were formulated:

- Reduction of internal rejection in Chakan Plant and Sanand Plant.
- Establishment of Kaizen Cell under the guidance of TRAD Expats to address chronic issues.

2.4.1.9 Strategies to address internal challenges for MTP3

2.4.1.9.2 New Product Development (NPD) Index Improvement: To improve NPD effectiveness, TTR introduced NPD Index that combines multiple KPIs and provides a single score to monitor and improve NPD performance across programs. Following strategies were formulated to improve NPD Index.

- Creation of New Product Development Index
- Strengthening of Gate review system
- Improve NPD lead time to launch – SA & OA programs
- Improve quality level of new child parts.
- Prevention of defect occurrence in NPD

2.4.1.10 Summary of Business Objective and Strategies: Based on the learnings from MTP-2 (remaining issues and internal challenges), TQM Diagnosis feedback, and external challenges, business objectives and strategies for MTP-3 were formulated as shown in the table below (**Refer Exhibit 2.4.1.10.1**)

Linkage: Vision and Mission	Objective	KPI *(UOM)* Good Direction	Strategies	KPI *(UOM)* Good Direction	Strategy Type
Exceeding Customer Expectations	Strengthening of New product development process	New Product Development Index *(%)* ↑	Strengthening of Gate Review System	Customer milestone (PPAP) timeline adherence- SA, OA and B *(%)* ↑	Base Building
			Improve NPD Lead time to launch-SA & OA Program	Lead Time to launch- SA Program *(week)*↓	Base Building
				Lead Time to launch- OA Program *(week)*↓	Base Building
			Improve quality level of new child parts	PIST > 95% *(%)* ↑	Base Building
				All SC/CC Cpk>1.33 *(%)* ↑	
			Prevention of Defect outflow in NPD	Number of customer complaint/ Program *(Number)* ↓	Base Building
Best in Class heat exchanger Solutions	Improve customer Satisfaction	Customer Rejection *(PPM)* ↓	Strengthening of Detection system using vertical evaluation	Customer PPM due to defect out flow from final inspection *(PPM)* ↓	Base Building
			Conversion of L1 to L2/L3 process controls for critical processes.	No. of parameters (*Number)*↑	Base Building
			Reduction of Supplier Rejection using problem solving QC Story Approach	Supplier Rejection *(PPM)* ↓	Base Building
			Process capability of all SC/CC characteristics Cpk>1.33	SC/CC parameters with Cpk>1.33 (*Number)*↑	Base Building

Exhibit 2.4.1.10.1: Business Objective and Strategies Table-MTP3

3. TQM Promotion

3.1 Background:

TTR introduced TQM in FY19, with FY18 considered the pre-TQM baseline for business performance. TQM was implemented in a phased manner, beginning with the Introduction Phase in MTP-1 (FY19–FY21), followed by the Establishment Phase in MTP-2 (FY22–FY24). TTR is currently in the Consolidation Phase (MTP-3 (FY25–FY27). In FY25, the TQM Diagnosis provided valuable insights to further strengthen TQM systems. TTR aims to further embed the TQM culture and continuously enhance organizational capabilities to achieve business objectives.

3.1.1 Need for TQM

During pre-TQM, TTR had internal issues of high customer rejection, low profitability and external challenges such as regulatory changes. To address these issues and challenges, achieve customer satisfaction and sustainable growth, TTR adopted an organization-wide Total Quality Management (TQM) approach.

TTR is challenging the Deming Prize to promote and inculcate a culture of Total Quality Management across the entire value chain. This initiative has strengthened TTR's leadership position in India by building robust organizational capabilities that deliver greater value to customers and society. The Deming Prize serves as a milestone to assess how effectively TTR is practicing TQM to achieve its goals. It will also help in institutionalizing, promoting, and strengthening TQM practices now and in the future.

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3.2 History of TQM:

TQM Phases		MTP 1 (FY19-21) Introduction Phase	MTP 2 (FY22-24) Establishment Phase	MTP 3 (FY25-27) Consolidation Phase
Business Objective		Improve customer satisfaction and achieve sustainable business growth	Improve customer satisfaction and achieve sustainable business growth	Achieve TTR's vision by exceeding customer expectations and achieve sustainable business growth
TQM Objective		Establish TQM practices aligning with business objective	Sustain and improve TQM practices to achieve objectives and strategies.	Strengthen TQM systems as a key enabler to achieve business objectives
Key Challenges in TQM Promotion		• TQM awareness across all levels • Improving employee involvement in KAIZEN, QCC and QC Story	• TQM promotion in support functions • Achievement of policy items • Improving employee involvement in QCC	• Improving PM process in terms of alignment of business objective and strategies • Continuous improvement of DWM and QC Circle • Involvement of supporting function in QC Stories • Resolving high impact & complex chronic issues
Organizational Capabilities	People	• TQM awareness training for all employees • Training in policy management, DWM and QC Circle	• Introduction and execution of 4 academies • Individual wise Competency Mapping	• PDCA of Competency development process • Integration of TQM training with Individual wise Competency Mapping • Certified DWM Assessor and Problem-Solving Champions, QC Circle trainings
	TQM Systems	• Formation of TQM Promotion Organization Structure • Setting Vision and Mission, • Introduction of Policy Management • DWM Implementation in Operations • Introduction of Kaizen, QC Circle, QC Story, Komatsu Flag System, QAM	• **Policy management –** Mid Term plan, FSM Evaluation, MP-CP Deployment • DWM –DWM in Support function, DWM assessment • QC Circle Improvement • Use of problem-solving QC story • CFM establishment	• **Policy Management:** Develop PM Manual, formats and target setting procedure, Annual Business Plan • **Daily Work Management:** DWM Manual and standard revision, abnormality framework • **Total Employee Involvement:** PDCA of TEI Framework and QC Circle, Digitization of TEI • **Cross Functional Management:** Develop manual for CFM, MSC of all CFMs

3.2.1 Improvements based on TQM Diagnosis Feedback: Feedback from Deming Examiners was categorized (high, medium, low priority) for action planning and actions were implemented based on the learnings. (**Refer Exhibit 3.2.1.1**) 01 actionable point related to mission will be completed by FY27.

Action Summary	High	Medium	Low	Total
Actionable Points	26	8	4	38
Closed Points	25	8	4	37

Exhibit 3.2.1.1: Status of TQM Diagnosis Feedback

3.3 TQM Promotion Structure: The TQM promotion structure comprises the TQM Council, followed by the Plant and Department Steering Committees (**Refer Exhibit 3.3.1**). The TQM Council is led by the CEO of TTR, while the Plant and Department Steering Committees are led by their respective heads, supported by TQM champions for TQM implementation. In MTP3, DWM assessors were added to the structure. Roles and responsibilities for each level are defined.

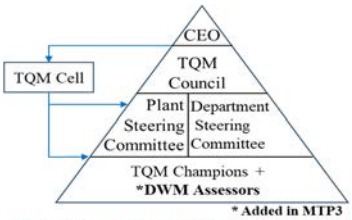


Exhibit 3.3.1: TQM Promotion Structure

3.4 TQM Model: In FY19, TTR developed its own model for TQM, which has evolved over the years. In MTP3, knowledge management has been added to focus on the capturing and utilization of knowledge in organization. The current version is shown in **Exhibit 3.4.1**. At the top of the TQM framework are TTR's vision and mission, with leadership defining customer focused strategies aligned across the organization. The TQM model is built on three pillars: Focused Methodologies, TQM Vehicles, and Review and Assessment. The 7S framework enhances the workplace experience and societal value through sustainability, while organizational capabilities enable continuous improvement, and transformation. Tata Values and commitment to society form the foundation of the TQM House.

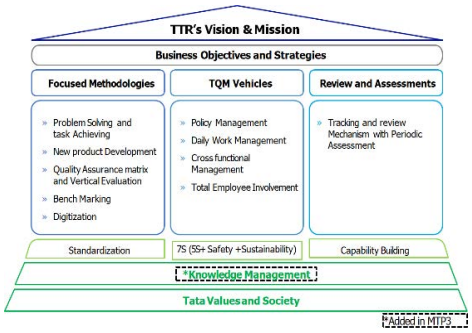


Exhibit 3.4.1: TQM Model

3.5 TQM Promotion: TTR initiated its TQM promotion journey with TQM Kick-off in FY19, followed by structured awareness activities such as display boards, quizzes, games, poster competitions, and slogan contests to drive employee engagement. **Exhibit 3.5.1** shows MTP-wise promotional activities.

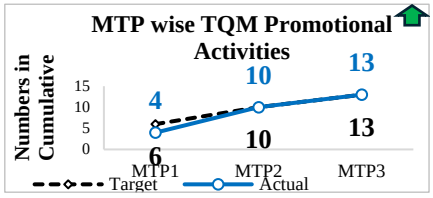


Exhibit 3.4.1: MTP wise TQM Promotional Activities (Cumulative)

3.5.a Visits to Deming Prize & Deming Grand Prize Winners: Visits to Deming Prize-winning companies, both Japanese and Indian, such as Toyota Japan and TVS Motors, were arranged for TTR employees. These visits

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include top management, key leaders, and TQM champions. The best practices learned from these visits are then implemented at TTR.

3.6 TQM Education: TTR launched a focused TQM education drive across all levels in FY19. Since then, TQM training has been conducted by external experts for employees across all cadres, based on their roles, to support business growth. Senior leadership's exposure to global quality practices is enabled through JUSE programs, ISQ conferences, and visits to Deming Prize–awarded companies. In MTP3, based on feedback from the TQM Diagnosis, TTR integrated TQM training into the employee competency framework through role-based competencies for individual employees (Refer Chapter 5.4). TQM training was also extended to direct employees through the skill development process. Internal experts were developed, including 16 certified DWM Assessors, 32 Problem-Solving Champions, and 46 employees trained in Task Achieving QC Story and QFD. **Exhibit 3.6.1** presents the cadre-wise and department-wise training matrix.



Exhibit 3.6.1: Cadre-wise TQM Training

3.7 TQM Vehicles

3.7.1 Policy Management: TTR's policy management has evolved from a result-oriented Balanced Scorecard approach in the pre-TQM phase to a process-driven TQM framework. **Exhibit 3.7.1.1** shows the year-on-year improvements made in the policy management process based on learnings from previous years.

Period	Learnings	Improvement in PM Process	Year
MTP 1 (FY19-21)	• Tracking of limited set of KPIs • Inadequate focus on customer and quality KPIs	Introduction of Policy Management Process	FY20
		Introduction of Customer Competition Analysis, PESTEL, SWOT analysis.	FY21
MTP 2 (FY22-24)	• Strategies to achieve objectives were not identified adequately • Combined evaluation of objective and strategies was not done	FSM Analysis for annual policies	FY22
		Revision of PM process flow	FY24
		Introduction of catch ball process and annual policy deployment through MP-CP	FY24
MTP 3 (FY25-27)	**TQM Diagnosis Feedback** • Most KPIs remain unachieved • PM Process: significant gaps in verifying comprehension among lower-level employees.	Revision of PM Process Flow	FY25
		Development of PM and Target Setting Manual	FY26
		Strengthening of Catch Ball Process, FSM Analysis, Year-End Policy Diagnosis	FY26
		Process development for bottom issues, suggestions	FY26

Exhibit 3.7.1.1: Year-on-Year improvements in Policy Management (PM) process

3.7.1.a Effectiveness of Policy Management: The progress of policy management is reviewed using the FSM to check how well the strategies are implemented and how effective they are (**Refer Exhibit 3.7.1.a.1**). The percentage of "Student A" cases have increased from 14% in FY21 to 49% in FY26 at the BU level.

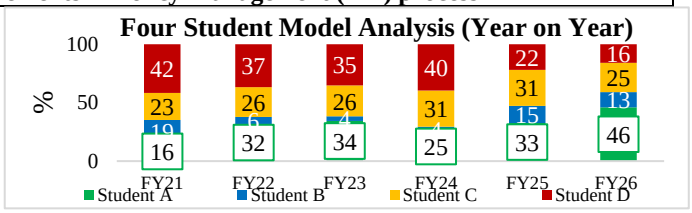


Exhibit 3.7.1.a.1: FSM Analysis

3.7.2 Daily Work Management (DWM): TTR's DWM evolved from KRA-based monitoring in pre-TQM phase to DWM framework introduced in FY19. It is further refined during MTP-2 through introducing DWM Manual. In MTP3, DWM framework is further strengthened by incorporating abnormality handling framework and learnings from TQM Diagnosis and internal assessment. **Exhibit 3.7.2.1** illustrates the Daily Work Management process flow followed by TTR in FY26. **Exhibit 3.7.2.2** shows year-on-year improvements made in the DWM process based on learnings from previous years.

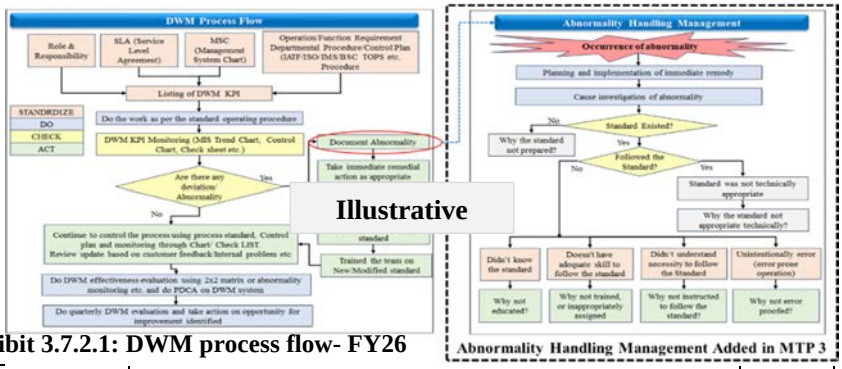


Exhibit 3.7.2.1: DWM process flow- FY26

Period	Learnings	Improvement in DWM Process	Year
MTP 1 (FY19-21)	KRA management was the practice to track functional performance.	Introduction of DWM: Operation and QA	FY20
		Individual roles and responsibility standardization	FY21
		DWM KPIs deployment using the MP-CP concept.	
MTP 2 (FY22-24)	• Lack of clarity of KPIs for PM and DWM in the MPCP sheet	DWM in supporting function	FY22
		DWM manual and DWM deck developed	FY24

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	• The expectation of the next process was not being addressed	Service Level Agreement Sign Off started	FY24
MTP 3 (FY25-27)	**TQM Diagnosis Feedback** • No distinction between PM and DWM KPIs **Other learnings of DWM (Internal Audits Observation)** • Inadequate abnormality analysis • DWM deck non-compliance	DWM manual revision	FY25
		Annual Business Plan process revised	FY25
		DWM abnormality framework developed	FY26
		Certified Internal DWM Assessor Developed	FY26
		DWM Assessment check sheet revision	FY26
		Guidelines for DWM deck compliance developed	FY26

Exhibit 3.7.2.2: Year-on-Year improvements in Daily Work Management (DWM) process

3.7.2.a DWM Effectiveness: DWM assessments are conducted to evaluate the effectiveness of DWM across the organization (**Refer Exhibit 3.7.2.a.1**). The DWM assessment criteria have evolved over the years to ensure continuous improvement. Year on year, DWM KPIs and standards have consistently improved (**Refer Exhibit 3.7.2.a.2**).

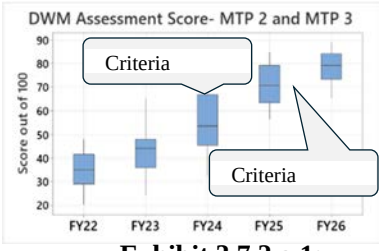


Exhibit 3.7.2.a.1: DWM Assessment

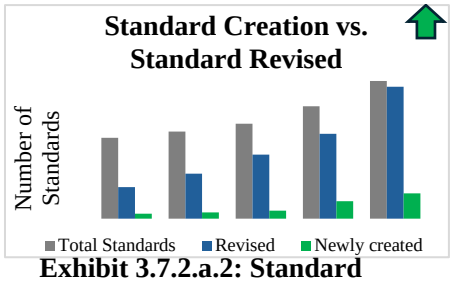


Exhibit 3.7.2.a.2: Standard revision

3.7.3 Total Employee Involvement (TEI): Before TQM, improvements were driven mainly through suggestion schemes and the 8D methodology. With TQM, TTR introduced a structured improvement system by introducing QC Circle activities and training for all employees. Based on the learnings from MTP1, TEI framework was introduced in FY24 and further strengthened in MTP-3. To address execution-type projects in supporting functions, Task Execution QC Story was also introduced in FY26 (**Refer Exhibit 3.7.3.1**).



Exhibit 3.7.3.1: TEI Framework

Exhibit 3.7.3.2 shows year-on-year improvements made in the TEI based on learnings from previous years.

Period	Learnings	Improvement in TEI	Year
MTP 1 (FY19-21)	• Low Awareness amongst employee for TEI • Low Involvement in Kaizen and QC Circle	QC Circle Kick Off	FY19
		Training of employees on Kaizen and QC Circle	FY19
		TEI Promotional activities implemented: Poster, Slogan Competition	FY20
MTP 2 (FY22-24)	• Lack of understanding on TEI • Tracking employee participation was not available	Development of TEI framework and Manual	FY24
		Individual wise tracking for participation in Improvement Projects	FY24
		Participation in Internal and External Competition	FY24
MTP 3 (FY25-27)	**TQM Diagnosis Feedback** • Increase QC story approach • Track more KPIs related to TEI • QC Circle expansion to non-manufacturing department • Broadening the use of AI	QC Story Projects on Digitalization: AI based inspection	FY25
		Task Execution QC Story included in TEI	FY25
		QC Story Projects on Digitalization: MES	FY26
		Training in Problem Solving and Task Achieving QC Story- External	FY26
		QC Circle implementation in non-manufacturing department	FY26

Exhibit 3.7.3.2: Year-on-Year improvements in Total Employee Involvement Framework

3.7.3.1. Digitalization of TEI: To reduce manual tracking of improvement projects, TTR developed a digital portal in three phases. Phase 1 covered Kaizen, Phase 2 expanded to QC Circle and QC Story, and Phase 3 will enable auto-calculation of TEI scores with real-time dashboards. The portal enables quick feedback and provides real-time visibility to all employees (**Refer Exhibit 3.7.3.1.1**).

Phase	Phase Description	Year
Phase I	Kaizen Digital Portal Introduction	Apr'25
Phase II	TEI Digital Portal Introduction	Dec'25
Phase III	Real time TEI calculation and Dashboard	Jun'26

Exhibit 3.7.3.1.1: TEI Digitalization Phased

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3.7.4 Knowledge Management: At TTR, information is systematically collected and analysed from both external sources and within the organization to ensure that insights, learnings, and best practices are retained and utilized to improve business information

3.7.5 Cross Functional Management: To establish a sustainable management system, TTR has implemented Cross-Functional Management (CFM) across key processes. These teams enable collaboration across functions and plants to achieve common objectives. Each CFM theme is led by the respective CFM leader and reviewed periodically by the CEO to ensure alignment and effectiveness. **Exhibits 3.7.5.1** illustrate the current CFM structure.

CFM	BD, Sales & Mktg.	Eng and R &D	PM	Oper.	ME	QA	VD, STA, & Pur.	HR	IT	Fin.	ESG
Safety	□	□	□	■◢	□	□	□	□	□	□	□
Quality Assurance	○	■	□	■	□	■◢	■	○	○	○	
New Product Development	□	■	■◢	□	■	■	■	○	○	○	○
Cost Management	□	□		■	□	□	■	□	○	■◢	
Digitalization	○	■	○	□	■	○	○	○	■◢	□	○
Employee Capability	□	□	□	□	□	□	□	■◢	□	□	○
ESG Management		■	○	■	□	○	□	□	○		■◢

■- Strong Relationship □- Moderate Relationship ○- Weak Relationship ◢- CFM Leader

BD, Sales and Mktg.: Business Development, Sales and Marketing, **Eng and R&D**- Engineering, Research and Development, **PM**- Program Management, **Oper.**- Operation, **ME**- Manufacturing Engineering, **QA**- Quality Assurance, **VD, STA & Purchase**- Vendor Development, Supplier Quality and Purchase, **HR**- Human Resource, **IT**- Information Technology, **Fin.**- Finance,

Exhibit 3.7.5.1: CFM Structure

3.8 External / Internal Convention: TTR promotes continuous improvement by encouraging teams to participate in internal and external conventions. Top teams are nominated for regional, national, and international forums such as ACMA, QCFI, ISQ, CII, and customer competitions. As shown in **Exhibit 3.8.1,** improvement-related awards increased from 1 in FY20 to 41 in FY26.

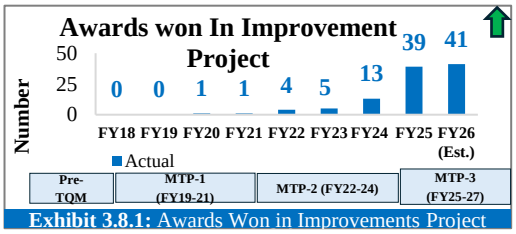


Exhibit 3.8.1: Awards Won in Improvements Project

3.9 Effects of TQM Promotion:

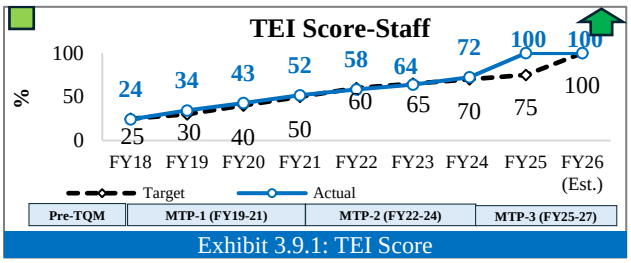


Exhibit 3.9.1: TEI Score

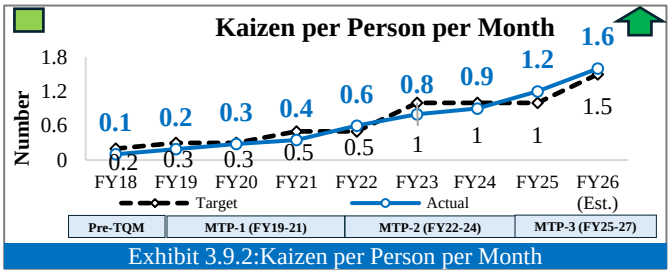


Exhibit 3.9.2:Kaizen per Person per Month

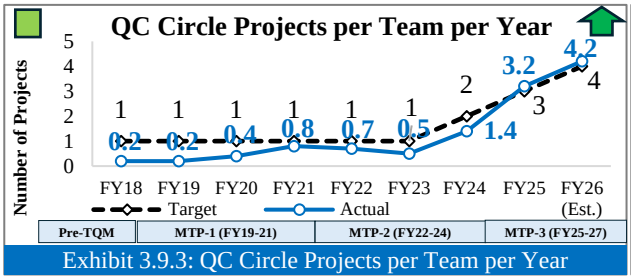


Exhibit 3.9.3: QC Circle Projects per Team per Year

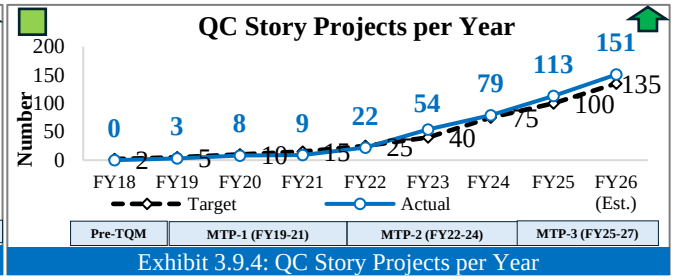


Exhibit 3.9.4: QC Story Projects per Year

3.10 Business objectives and application of TQM vehicles and techniques: Exhibit No. 3.10.1 indicates various TQM vehicles, methodologies and tools utilized to accomplish the business objectives.

Linkage: Vision and Mission	Objective	KPI	TQM Vehicle				Focused Methodologies							Other TQM Tools and Methodology						
			PM	DWM	CFM	TEI	PSQC	TAQS	NPD	VE	QAM	Benchmarking	Digital	QCC	Kaizen	TEQS	QFD	T-Matrix	SPC	Flag System
Exceeding Customer Expectations	Achieve top rating for Key Customers	Key Customers (by revenue) giving Top Rating	■	■	■	■	■	■		■	■			□	□		□	□	□	□
	Improve market share for CV Segment	Radiator market share for CV Segment	■	□	■	■		□	■			■				■	■	■		
	Strengthening of New product development process	New Product Development Index	■	■	■	■	■	■	■				■				■	■		
Addressing Changing Needs of Industry	Development of New products as per industry needs	New Products Development	■	■	■	■		■	■			■					■	■		
	Creating Digital Enterprise	Digitalization Road Map Adherence	□	■	■	■		■	■			□	■			□				
Best in Class heat exchanger Solutions	Improve customer Satisfaction	Customer Rejection	■	■	■	■	■		□	■	■			□	■				■	■
	Built Quality in Process	First Pass Ratio	■	■	■	■	■			■	■			■	■				■	□
Preservation of Environment	Create Sustainable Operations	GHG Intensity (Scope 1 and Scope 2)	■	■	■	■	■	■				□		□	□	■				
Betterment of Society	Drive Organizational Values & Culture	Gender Diversity- all employee	■	■	□	■	□													
		CSR Per capita volunteer hours	■	■																

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4. Practice of Challenging Strategy

4.1 Title: Offering extended warranty life to Customer in CV Segment (From 18 MIS to 36 MIS)

4.1.1 Background: As part of MTP-3 objective to improve radiator market share in CV segment, TTR planned to implement strategy of offering extended warranty to CV segment from 18 MIS to 36 MIS. At the end of MTP-2, TTR market share in CV segment was XX% and it was planned to be increased to YY% by FY27. In FY 24, Customer A was highest contributor in TTR's CV segment sale.

BSVI emission norms were introduced on 1st April 2020. During the same period COVID-19 lockdown happened. TTR ensured consistent supply and operational support to Customer A, which enabled TTR to increase its share of business (SOB) with Customer A. However, TTR faced field failures in radiators. This has reduced Customer A SOB from FY22 to FY24. Field failures were resolved through design changes & structured problem-solving QC story project. Offering extended warranty life from 18 MIS to 36 MIS is initiated with Customer A followed by remaining customers.

4.1.1.1 Voice of customer: During MTP-2, TTR interacted with Customer A and collated VOC to gather feedback on product performance and emerging needs. Customer A expressed need for increased warranty at reduced product pricing. TTR translated this VOC into clear product specifications using QFD.

4.1.1.2 Competitor Benchmarking: TTR conducted benchmark studies against competitors in the automotive segment to evaluate SMART Core–based products. TTR outperformed competitors in product size and performance while offering comparable warranty coverage (**Refer Exhibit 4.1.1.2.1)**. TTR targeted to offer extended warranty life for CV segment customers starting with Customer A being major customer in FY23.

Parameter	UOM	Commercial Vehicle		
		TTR	Comp. 1	Comp.2
Emission Norms	Bharat Stage	BS6	BS6	BS6
Core Thickness	mm	XX	AA	BB
Technology	NA	B-tube	B-tube	B-tube
Performance (Heat Rejection)	Performance to Weight Ratio Reduction	XX	No Change	BB
	Part Weight Reduction	XX	No Change	BB
Warranty Life	MIS	18	18	18
Legends	Best performance with respect to performance to weight ratio and part weight			

Exhibit 4.1.1.2.1: Competitor Benchmarking

4.1.2 Understand the problem: TTR faced warranty failures of Tank crack and Tube leakage in Customer A. These problems are resolved using structured problem-solving QC story approach. Failures after corrective action are monitored and there are no repeat failures.

To achieve 36 MIS warranty life target for the commercial vehicle segment, TTR analyzed past field failures through "Claims by ownership" for MTP 2 period. The analysis identified Product Planning, Manufacturing & Design responsibilities. Product Planning and Design-related defects were further analyzed using the T-Matrix, Supplier process and TTR process-related defects were analyzed through the GDAD matrix.

4.1.3 Set up the Task:

4.1.3.1 Collection of real-world usage patterns using road load data acquisition: To understand the real-world usage profile of product, TTR adopted Gemba-based approach in collaboration with the end user and conducted Road Load Data Acquisition (RLDA) studies on running vehicles in field. The vehicle was operated for actual operating conditions, encompassing city traffic, national highways, straight highway stretches, and rough-road environments, including mining applications. Field data was collected and analyzed to identify opportunities for product design improvement and to validate performance under real-world usage conditions.

4.1.4. Explore and select the scenario:

4.1.4.1 Converting customer voice into product specifications using Quality function deployment:

TTR translated key customer requirements into detailed product specifications to enhance design and meet expectations for extended warranty life, reduced size, and lower weight. Using input from RLDA data and QFD analysis (**Refer Exhibit 4.1.4.1.1**), product design specifications and validation requirements were identified and implemented for continuous improvement.

Quality Function Deployment for Ashwamedha Atulya Radiator

VOC	System Characteristics	Heat Rejection (KW)	Core thickness (mm)	Core Type (Tube technology)	Fin pitch	MS Material thickness	Air-side pressure drop (RAD)	FAN size	Fin type
Quality Importance Score		69	179	147	123	169	59	91	59
Quality Weight Score		1.9	4.7	3.9	3.4	4.2	1.7	2.2	1.7
Priority									
Competitive analysis:									

4.1.5 Implement Scenario:

4.1.5.1 Design improvement and soft simulation: Based on inputs from the T-Matrix, QFD, and RLDA, the product design was developed and validated through CAE and FEA simulations, resulting in an optimization of stress levels and improved overall design robustness.

Below are few examples of design modification shown in **Exhibit 4.1.5.1.2**

Input	Cause	Before	After	Benefit
Corner tube failure **Input from:** T-Matrix	Design Failure a) Thermal Cycle fatigue b) High stress due to vehicle vibrations	Fixed Joint	Fully floating Joint **(Patent Filed)**	1.Radiator is free to expand and contract 2.Rubber Bushes are provided to damp the forces due to vibration.

Exhibit 4.1.5.1.2: Design Improvement based on inputs from T-Matrix, QFD and RLDA

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4.1.5.3 Process related actions: Following actions were implemented.

a. DOE for core band size and type optimization.
b. Poka-Yoke implementation for core band verification
c. Run chart for fin height monitoring
d. DOE for brazing process parameter optimization

4.1.6 Check: Design Validation Test: The test facilities were equipped using data obtained through Road Load Data Acquisition (RLDA). Based on this real-world usage data, the new design was validated to ensure reliable performance under actual operating conditions.

4.1.7 Process design modification to achieve 36 MIS warranty: To meet the 36-month MIS warranty life requirement, the brazing process specifications were revised to change number of consecutive convolutions unbrazed.

4.1.8. Standardization and conclusion:

4.1.8.1 Received design approval from Customer: By following successful product design validation, TTR proposed a new design to Customer A and conducted vehicle-level testing. Based on its performance under actual operating conditions, Customer A approved the design and new design offered with a warranty period of 36 MIS or 3 lakh km from November 2022.

4.1.8.2 Delivering Enhanced Customer Value Through Extended Warranty and Cost Optimization: TTR implemented the new design and offered an extended warranty life from 18 MIS to 36 MIS, delivering a superior value proposition. This improvement provided TTR with a strong competitive advantage and helped to increase share of business with Customer A.

4.1.9 Overall Effects:

4.1.9.1. Tangible Effects

- Warranty failure reduced
- Warranty Cost Reduced

4.1.9.2 Intangible Effects	4.1. 10 Organizational Capabilities Acquired	4.1.11 Future Plan
• Enhanced customer trust through proven long-term reliability • Stronger brand reputation as a leader in quality and durability	• Advanced Product Validation Capability through RLDA and vehicle-level testing • Strengthened Process Control Expertise in Critical manufacturing operations	• Offer 36MIS to major OEMs

4.2 Title: Export Growth Through Product Development and Manufacturing of New-Generation Heat Exchangers

4.2.1 Background: In line with TTR's vision to achieve market leadership by quantity, TTR identified export market as a potential growth area. The order booking potential of export market is 20 times higher in FY27 compared to FY24. Hence, TTR decided to build the capability of new-generation heat exchanger to serve export market.

4.2.1.1 Strategy to achieve export growth: TTR identified export opportunities which will not conflict with its JV partner's global operations. Using the Ansoff Matrix, TTR identified Customer B and Customer C as potential customers. To secure business from Customer B and Customer C, TTR had to expand its product portfolio from conventional to new-generation heat exchangers. For this, TTR need to develop its capabilities to design and manufacture new-generation heat exchangers. TTR will be the first heat exchanger company in India with capability to manufacture these advanced products.

4.2.2 Challenges and Plan:

TTR did not have the capabilities to design, develop and manufacture new-generation heat exchanger products. TTR captured customer expectations and analyzed internal challenges and growth opportunities.

4.2.3 Implementation Plan: Based on expectations and internal challenges, KPIs were set. (Refer **Exhibit 4.2.3.1**)

Category	Challenges	Strategy	KPI *(UOM) Good Direction*
Internal Challenge	No prior experience in process design, development, and manufacturing	S1. Site assessment and selection for plant development	Site selection and development as per target *(numbers of weeks)* ↓
		S2. Improve program review system through MSP implementation	Project development as per target *(numbers of weeks)* ↓
		S3. New process development through people capability building and using NPD tools (DFM, DOE & PFMEA)	People capability index *(index)* ↑
			First time right *(%)* ↑
			Stable processes *(numbers)* ↑
			Critical (CC) parameters CpK >1.67 *(numbers)* ↑
			Internal Rejection *(% to sales)* ↓
			L3 controls designed *(numbers)* ↑

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4.2.4 Implementation

S1. Site Assessment and Selection for Plant Development

A. Site assessment for plant development: TTR selected Ready-to-use industrial shed (Rented) choice, as it offered the fastest start to operations, based on assessment criteria. (**Refer Exhibit 4.2.4.S1.A.1**)

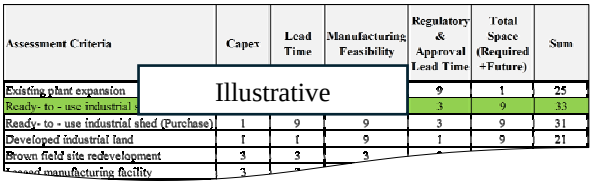


Exhibit 4.2.4.S1.A.1: Site Assessment for plant development

B. Site selection & development: TTR modified the site selection and development procedure. TTR evaluated ready-to-use rental industrial sheds based on the selection criteria. (**Refer Exhibit 4.2.4.S1.B.1**). Feasibility to put Zero Litre Discharge [ZLD] ETP plant was considered EHS & Safety Infrastracture. This helped in achieving development lead time of 26 weeks.

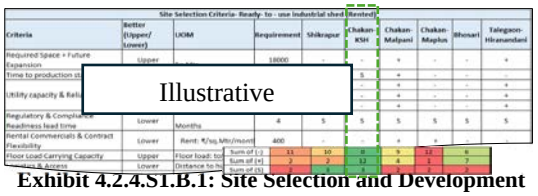


Exhibit 4.2.4.S1.B.1: Site Selection and Development

S2. Improve Program Review System through MSP Implementation: Considering complexity of the project, MSC of NPD was revised for review system of SA Program (**Refer Exhibit 4.2.4.S2.1**). TTR introduced MSP (Micosoft Projects) software to track critical paths and eliminate gaps between project teams.

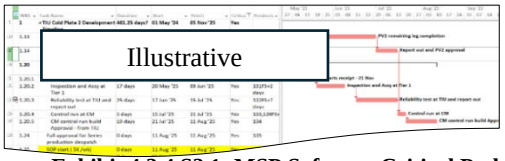


Exhibit 4.2.4.S2.1: MSP Software Critical Path

S3. New Process Development through people capability building and using NPD tools

A. Process design and development:

Process: Modified process planning, POC/proto builds, and customer feedback were leveraged to reduce risks, while robotic lines, process simulation, supplier reviews, and enhanced FAT checkpoints ensured safe, robust, and capable production readiness.

People: Built a competent workforce through deployment of experienced personnel, targeted hiring, specialized training, supplier-end learning during FAT, and dedicated on-site supplier support to ensure successful process implementation and capability development.

NPD Tools: Design For Manufacturing (DFM), Past Trouble Database (PTDB), VDA PFMEA.

Outcome: Process trials, parameter validation, and process optimization done with the help of statistical tools. All the learnings standardized by preparing process manuals.

B. Supplier selection for new process equipment:

TTR evaluated 43 overseas and domestic equipment suppliers with relevant experience. Using funnel elimination method (**Refer Exhibit 4.2.4.S3.B.1**), 12 suppliers were shortlisted.

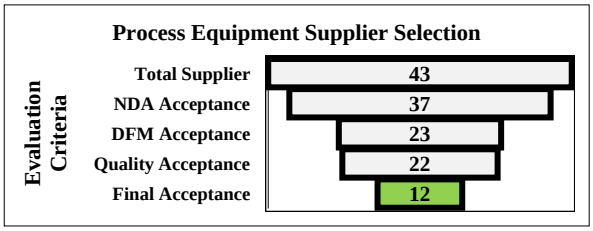


Exhibit 4.2.4.S3.B.1: Supplier Evaluation & Selection

S4. Process Digitization for End-To-End Traceability

MES platform selected based on Gartner's Magic Quadrant report, VOC and VOB. XX processes digitized establishing end-to-end traceability from dispatch invoice to child part invoice. (**Details in Departmental DTQMP 5.1 – 5.7 Application case study**).

S6. Child Parts Tolerance Stack-up Analysis

TTR addressed child part design challenges related to joints, materials, performance, and machining with benchmarking and simulation-based analysis. **Refer Exhibit 4.2.4.S6.1** for details.

Challenges	Design Strategy	Method	Tool used	Result
First time right product	Reconfirm performance specs & margins	CFD (Computational Fluid Dynamic)	Ansys Fluent	Performance specifications have sufficient margin.
	Reconfirm burst pressure	CAE	Abaqus	Burst pressure spec Burst pressure found Ok.

Exhibit 4.2.4.S6.1: Child Part Design Challenges and Solutions

S7. Supplier Selection for Child Part Development

Considering machining and casting processes for child part, new supplier selection was required. TTR evaluated 34 suppliers. Using funnel elimination method, 8 suppliers were shortlisted based on defined evaluation criteria. .

4.2.5 Results: **Refer Exhibit 4.2.5.1** for results achieved against the KPIs set for the project.

Category	Challenges	Strategy	KPI *(UOM) Good Direction*	Actual
Internal Challenge	No prior experience in process design, development, and manufacturing	S1. Site assessment and selection for plant development	Site selection and development as per target *(numbers of weeks)* ↓	
		S2. Improve program review system through MSP implementation	Project development as per target *(numbers of weeks)* ↓	
		S3. New process development through people capability building and using NPD tools (DFM, DOE & PFMEA)	People capability index *(index)* ↑	
			First time right *(%)* ↑	
			Stable processes *(numbers)* ↑	
			Critical (CC) parameters CpK >1.67 *(numbers)* ↑	

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4.2.5.1 Tangible Benefits

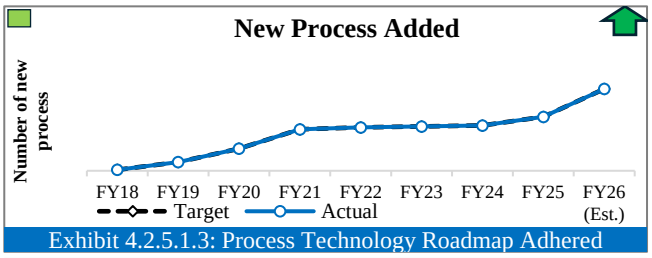


Exhibit 4.2.5.1.3: Process Technology Roadmap Adhered

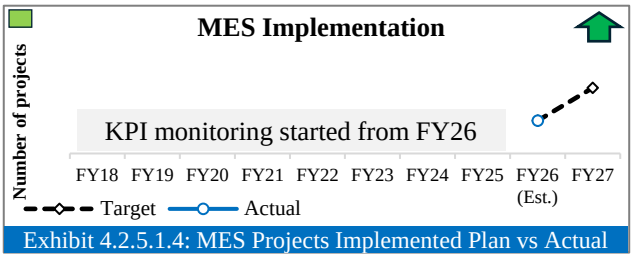


Exhibit 4.2.5.1.4: MES Projects Implemented Plan vs Actual

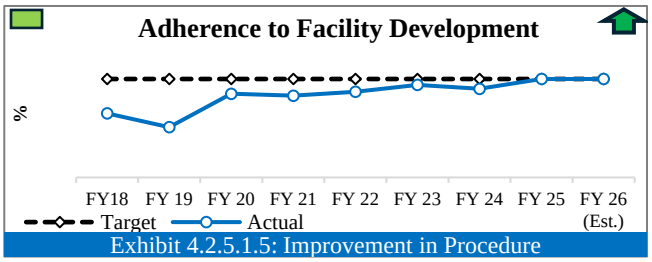


Exhibit 4.2.5.1.5: Improvement in Procedure

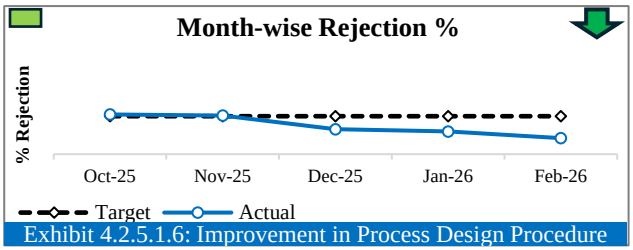


Exhibit 4.2.5.1.6: Improvement in Process Design Procedure

4.2.5.2 Intangible Benefits

- Improved organizational learning & technical capability
- Cultural shift toward digital & data-driven operations

4.2.6 Capability Building

4.2.6 Capability Building

4.2.5.2 Intangible Benefits	4.2.6 Capability Building
• Improved learning and technical capabilities. • Cultural shift towards digital driven operations.	• **Technology**: Stamping, Machining, Casting Simulation. • **Process Capability:** DFM, VDA PFMEA.

4.2.7 Conclusion and Future Plan

With the completion of the Customer B project, TTR is the first company to manufacture new generation heat exchanger (product X) domestically, strengthening its capability. Learnings standardized through PTDB and process manuals. Now, TTR is engaging with global and domestic OEMs for co-development of new-generation heat exchangers.

4.3. Challenging Strategy: Expanding EV product portfolio- Development of High-Performance Condenser.

4.3.1 Background: To improve quality of life, to reduce air and noise pollution from ICE vehicles, and to meet stringent emmision norms, customers are developing Electric/Hybrid Vehicles (EVs). The global EV market is expected to reach 50 million vehicles by FY30, with India projected to reach 1 million by FY30 (*Source- Bain & Company*). As EVs require ~12 heat exchangers versus 7 in ICE vehicles, this offers significant business opportunity. To achieve our vision of becoming India's No.1 heat exchanger supplier by quantity, TTR must develop range of EV heat exchangers.

Based on product and market requirement study, TTR has identified 22 heat exchangers that need to be developed. One of them was high-performance condenser to address increasing demand in EVs.

4.3.2 Understand Problem.

EVs require higher capacity condensers as it supports multiple thermal loads from battery, in addition to cabin cooling requirement. Making the condenser bigger in size with existing designs, can meet high performance. But customer want smaller and lighter designs. So, new condenser design is needed. Problems to resolve are-

1) Meet high-performance requirement with reduced size. 2) Review and address problems of current designs.

4.3.3 Set up the Task.

The objective is to define clear improvement areas for developing new condenser design. Product specifications are identified from QFD **(Refer Exhibit 4.3.3.1),** Design related defects in existing design are analysed with T-Matrix **(Refer Exhibit 4.3.3.2)**. Design goals (**Refer Exhibit 4.3.3.3**) are set based on inputs from QFD and major defect from T-Matrix.

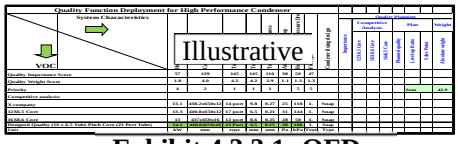


Exhibit 4.3.3.1: QFD

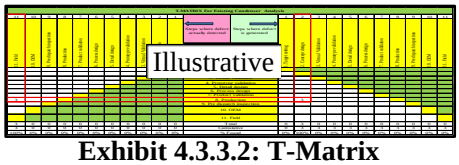


Exhibit 4.3.3.2: T-Matrix

	Input	Better	Target (Customer Requirements)
1	Meet heat dissipation and performance requirement. (From QFD)	↑	1) Heat Dissipation
		↓	2) Refrigerant pressure drop Max
		↓	3) Air pressure drop

Exhibit 4.3.3.3: Design Goals

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4.3.4 Explore and Select Scenario: Based on design goals, various concepts with tube and core geometries are prepared **(Refer Exhibit 4.3.4.1).** Advantages and disadvantages are evaluated for each concept. Concept evaluation is done with Pugh Matrix **(Refer Exhibit 4.3.4.2.).**

#	Concept	Advantages and Disadvantages
1	Optimize Width (W) and Height (H) in existing core.	**Advantages:** Can meet the performance, Less mfg. Investment **Disadvantages:** Can not meet packaging & Weight target of customer.
2	Optimize Thickness of Core	**Advantages:** Can meet the performance, **Disadvantages:** Can not package, cannot meet weight target, High mfg. Investment

Exhibit 4.3.4.1: Concept evaluation

PUGH Matrix for design improvement in condenser			
Criteria	**Concept Selection**		
	Optimize Size	**Optimize core thk**	**Optimise Tp & increase No. of windows**
High heat dissipation rate	+	-	+
Low pressure drop	+	+	-
No leak at baffle	S	S	S
Sum (S)	**2**	**2**	**3**
Sum (+)	**3**	**3**	**4**
Sum (-)	**4**	**4**	**2**

Exhibit 4.3.4.2: Evaluation

4.3.5 Implement Scenario (Product Design and Development):

4.3.5.1 Challenges faced and Action taken: Challenges identified based on QFD, and the actions taken are mentioned in **Exhibit 4.3.5.1.1**

#.	Challenges Faced	Action Taken
1	Packaging limited by existing vehicle mounting points and available space.	Size of condenser is made compact with optimized tube pitch core design and all other vehicle mounting points are maintained.

Exhibit 4.3.5.1.1: Challenges Faced and Action

4.3.5.2 CAD Packaging Study, DFMEA activity:

Packaging checks & DMU checks were completed by IQA-1 to ensure vehicle packaging. Design Review and DFMEA completed with CFT and drawings were released for prototype manufacturing.

4.3.5.3 FEA Analysis:

Vibration Analysis is conducted at YY as against XX normally used for Passenger class, city running vehicle. Modal analysis is introduced for first time to check the resonance frequency and ensure that it is significantly above the allowable frequency.

4.3.5.4 CFD Analysis: CFD analysis in Coil Designer is carried out to check the refrigerant side pressure drop & performance for 4-pass condenser with multi-phase fluid flow and air side pressure drop is simulated using software (AccuSolve).

4.3.5.5 Prototype Performance Verification: Prototype soft tooled sample was tested in wind tunnel for performance test and verified with simulation results

4.3.5.6 Durability Testing: Vibration test performed as per JIS Standard, at XX level.

#	Customer Requirements	Better	Improvement (%)
1	1) Heat Dissipation (kW)	↑	Better by 5.7%
	3) Air side Pressure drop (Pa)	↓	Better by 12.9 %
3	1) Burst Pressure	↑	Better by 5%

Exhibit 4.3.5.6.1: Vibration Test Setup

4.3.6 Confirm Effects

4.3.6.1 Technical results:

4.3.6.2 Quality Results: All design defect identified in **Exhibit 4.3.3.2** are eliminated. Design guidelines are updated. No defects are repeated in condensers. **Refer Exhibit 4.3.6.2.1**

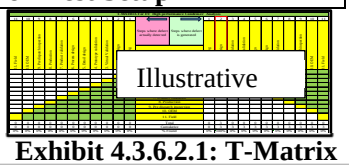


Exhibit 4.3.6.2.1: T-Matrix

Design Improvement based on inputs from T-Matrix and QFD			
Input (Source)	**Cause**	**Actions**	**Benefit**
Tube Design (QFD)	To meet, 1 Heat dissipation	Number of ports optimized from XX to YY	Stronger for durability
Tube Pitch (QFD)	2 Refrigerant side Pressure drop 3 Over all size requirement	Tube Size optimized from XX to YY	

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4.3.6.3 Tangible Benefits:

- Sales Projects- 20X in YY Years
- Number of New Product Development- XX Numbers

4.3.6.4 Intangible Benefits

• Enhanced customer confidence.	• Innovation culture & mind set.
• Early mover advantage for EV application.	• Improved brand & market perception.

4.3.7 Capability Building and Skill Enhancement:

1) Competency acquired for refrigerant pressure drop with 3D CFD
2) Competency acquired for Modal Analysis.
3) Skills acquire to use TQM tools like QFD and T-Matrix.

4.3.8 Remaining Issues & Future plan

Remaining Issues	Future plan
• Horizontal deployment of condenser tube sizing.	• Extending the high-performance Core for all EV Application & High-end ICE Application as well.
• Development of remaining EV products	• Designing & developing product as per RLDA

4.4 Title: Increase volume of 2-Wheeler Segment

4.4.1 Background: In alignment to TTR's vision of achieving market leadership by quantity, TTR has identified 2-Wheeler segment as a potential growth area where market share is projected to increase from XX% in FY24 to YY% in FY27 in terms of no. of heat exchangers.

4.4.2 Understand the problem:

4.4.2.1 Voice-of-Customer:

- "Explore localization for cost competitiveness"
- "Improve on-time delivery performance".
- "We want suppliers for multiple product"

4.4.2.2 Competition Benchmarking: TTR did benchmarking of competition to analyze competitive advantages and opportunities to improve its product. (**Refer Exhibit 4.4.2.2.1**)

Competition Analysis at MTP -2	TTR	Comp 1	Comp 2	Proposed TTR Strategy
Technical Performance	Higher performance	Lower differentiation	Proven products	Product benchmarking
Delivery	Single- location plant	Multi-location plants	Multi-location plants	Capacity enhancement. Warehouse addition

Exhibit 4.4.2.2.1: Competition Benchmarking

4.4.3 Set up the tasks: TTR has studied the Indian 2-Wheeler market segment. It was already present in the PV, CV and tractor segments of Customer D. Hence, TTR had an opportunity to enter the Customer D 2-wheeler segment. TTR presence in Customer E and global presence of JV partner provided opportunity for TTR to enter 2-Wheeler businesses of potential customers. TTR prioritized engagement with these customers to gain entry and expand its addressable market. Other two major customer were considered for the future (post FY27). TTR is present only in Customer E with 100% share of business. To achieve the required growth, TTR had to increase its addressable market by the addition of new customers. Using the Ansoff matrix, TTR further analyzed the potential for growth.

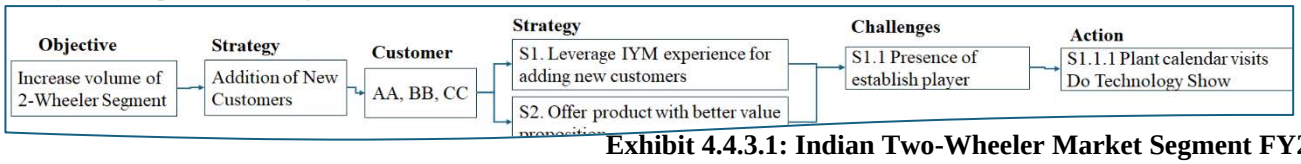


Exhibit 4.4.3.1: Indian Two-Wheeler Market Segment FY24

4.4.4 Explore and select the scenario: Competition was already established where TTR was targeting entry. Hence TTR identified customer-wise challenges and accordingly formulated the strategies (**Refer Exhibit 4.4.4.1**)

4.4.5 Implement the scenario:

4.4.5.S1 Leverage experience with IYM and add new customers:

- Plans for calendar visits to customer touchpoints (Sourcing, Development and Design).
- Joint visits with representatives from JV Partner T.RAD and TACO for strong business pitch
- Presentation demonstrating value proposition. Discussion yielded valuable customer insights and feedback.
- Technology shows at in-house premises, customer sites and forums like Bharat Auto Expo.

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These activities helped improve brand visibility, customer goodwill and awareness on TTR 2-Wheeler presence.

4.4.5.S1 Offer JV Partner Technology: TTR focused on gaining market share through leveraging technological advantages of JV partner's globally proven product. TTR was already present in 2- Wheeler segment with product. To improve value proposition, TTR did detailed benchmarking of its product against competitor offerings to improve the product design.

4.4.5.S2 Offer product with better value proposition: TTR used QFD to convert VOC into a product specification and did the benchmarking of products with the competitor (**Refer Exhibit 4.4.5.S2.1)**. Using Pugh Matrix TTR selected and developed a design performing better than the competitor. (**Refer Exhibit 4.4.5.S2.2)**.

4.4.5.S3 Cost Competitiveness: To ensure cost competitiveness in product offering, TTR focused on localization initiatives. TTR imported child part which impacted product costs to customers. With technical support from our JV partner, TTR developed child part with local supplier and introduced it in customers for their upcoming 2 - Wheeler models.

Quality Function Deployment for 2-Wheeler Fan Motor

VOC \ System Characteristics	Air Flow	Current	Motor Rotation	Life	Fan Dia suitbale	Weight
Priority	1	2	3	4	5	6
Competitive analysis:						

Exhibit 4.4.5.S2.1: Example of QFD for Fan Motor

Pugh Matrix for design improvement in 2- Wheeler Fan Motor

Criteria	Concept Selection		
	Used BCW motor	Use competitior	Develop MC37 motor
Air flow	-	-	+
Current Consumption	-	-	+
Motor Speed	S		

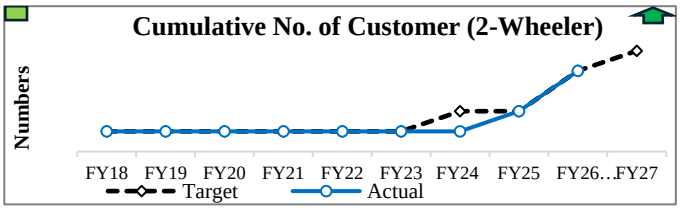
Exhibit 4.4.5.S2.2: Example of Pugh Matrix for Fan Motor

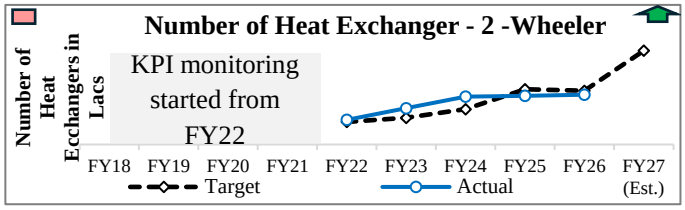
4.4.5.S4 Entry into New Product, New Customer: 2-Wheeler OEMs prefer suppliers as having capability multiple products. Entry into the new product would open additional X unit market potential for TTR. TTR has already received RFQ from new customers out of which one customer order expected in FY27. TTR is currently developing new product through technology transfer from its JV partner.

4.4.5.S5 Capacity Enhancement: In line with Year-on-Year growth projections and future demand from existing and potential customers, TTR plans to expand manufacturing capacity ~2 times units/day through addition of manual and automated core builders along with Pre-ALT and Post-ALT machines. To support outstation customers and ensure uninterrupted supply, TTR operates warehouses near to customer locations.

4.4.5.S6 On time new product variant development: TTR has focused on the on-time development of product variants in line with customer requirements. Cross-functional management of new product development (refer Chapter 5.2 – Management of New Product Development) ensured that product variant development was completed on time, with no delays to the customer's product launch.

4.4.6 Confirm the effects: Refer **Exhibit 4.4.6.1 and 4.4.6.2**





4.4.7 Transfer to Daily work Management:

- SOP written for expansion in existing markets and opportunities in new markets (Horizontal deployment)
- Started weekly status review of registered RFQ along with JV partner and TTR design team

4.4.8 Conclusion and Future plans

- Generated order booking of ~ 120% of plan in FY 26 converting new enquiries

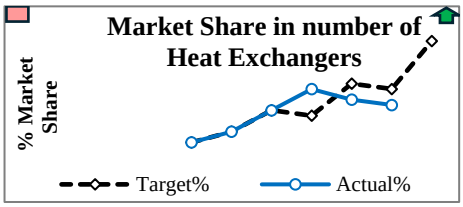


Exhibit 4.4.9.1.1: Market share in number of Heat exchanger (2-Wheeler)

4.4.9 Overall effects:

4.4.9.1. Tangible Effects

- Improved market share. **Refer Exhibit 4.4.9.1.1**

4.4.9.2. Intangible Effects

- Entry into new products would open up multiple opportunities for future business with new customers
- Entry into new customers would open up multiple opportunities for future business new products.

4.4.10. Organizational Capabilities Acquired:

- Progressing from manual core assembly to automated core assembly set up
- Replacement of manual cleaning through shot blasting for powder coated radiator assemblies.

4.4.11. Remaining Problems and Future Plan

Remaining Problem	Future Plan	Beyond FY27
Convert order booking into sales	• New Product Development • Localization of Child Part	Add new customers:
Expand TTR market Coverage	• Making entry into new business	

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5: Practice of Base Building Strategy

5.1 Title: Management of Quality

5.1.1 Background: In the pre-TQM phase, TTR ensured product quality mainly through inspection. During MTP-1, TTR transitioned to a Cross-Functional Management approach ensuring Quality Assurance and Quality Management across all functions, from Q1 to Q11, as illustrated in **Exhibit 5.1.1.1**.

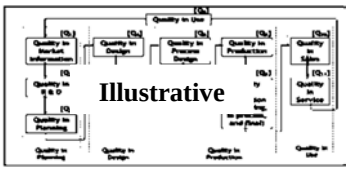


Exhibit 5.1.1.1: Quality Assurance System

5.1.2 Quality Assurance System

TTR uses Quality Assurance System Chart as CFM approach **Refer Exhibit 5.1.2.1** for elaborating role of each function in QA. This CFM approach identifies activities carried out at every stage, KPIs, check points & work standard to be followed by each function. TTR has adopted VE, QAM, Flag System, Problem Solving QC story, Task Achieving QC story as TQM tools to ensure Product & Process Quality.

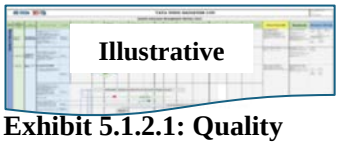
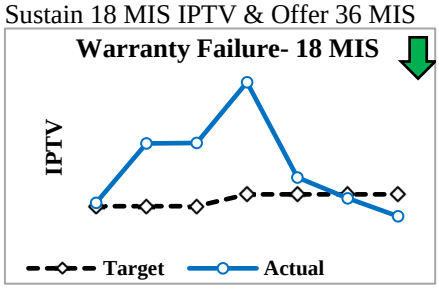
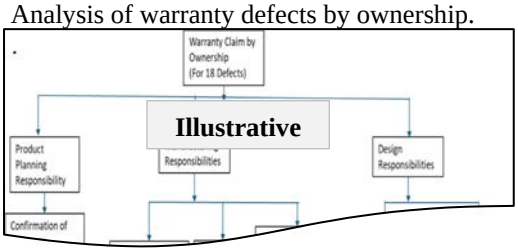


Exhibit 5.1.2.1: Quality Assurance System Chart

5.1.3 History of Focused Activities -

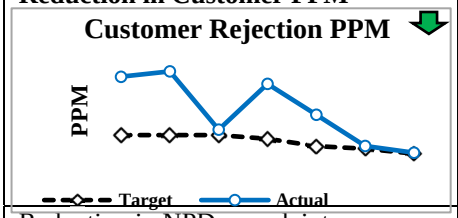
TQM Phase	MTP1 (FY19-21)	MTP2 (FY22-24)	MTP3 (FY25-27)
Objectives	Improve customer satisfaction by Reducing, 1.Warranty failures (18 MIS) following a revised calculation method. 2.Customer PPM 3.Supplier PPM 4.Internal rejection 5.No. of customer rating criteria not met	Improve customer satisfaction by reducing, 1- Warranty failure (18MIS) 2- Customer PPM 3.Supplier PPM 4.Internal rejection 5.Number of customers rating criteria not met	Exceeding Customer Expectations by, 1.Increase no. of key customers giving top rating 2.Reduce warranty IPTV for 36 MIS 3.Customer PPM 4. Improve first Pass Ratio 5.Supplier PPM reduction 6. Reduce average no. of complaints per project in NPD parts.
Focused Activities	1. Warranty IPTV calculation method revised 2. Failure reduction through Problem Solving Approach 3. Elimination of top defect using Komatsu Flag System. 4. VE/QAM and problem-solving approach for chronic issues.	1.IQA-1 & 2 implementation. 2.Failure reduction through problem solving approach. 3.using VE to reduce defect outflow 4. Customer Rejection using Customer value management 5."Utkarsh" program to improve Supplier capability	**A. Prevention of Defect outflow** A1. Inspector capability improvement A2. Early defect detection through VE and GDAD matrix **B. Prevention of Defect Occurrence** B1. Process stability and capability improvement of SC, CC parameters. B2 Built Quality in Process **C. Supplier capability improvement**
Effects	Objectives / Baseline FY18 / Target FY21 / Actual FY21 IPTV-18 MIS: 0.64 / 1 / 5.74 Customer PPM: 336	Objectives / Baseline FY21 / Target FY24 / Actual FY24 IPTV-18 MIS: 5.74 / 1 / 0.07 Customer PPM: 307	Objective / Baseline (FY24) / Target (FY26) / Actual (FY26 Est.) * Number of Key Customers giving top rating: 7 / 7 / 8 *Warranty PTV 36 MIS: NA / 0.5 / 0.1 Customer rejection PPM: 29
Remaining Issues	Not Achieved Objective • Warranty IPTV • Customer PPM • Supplier PPM • Internal rejection.	Not Achieved Objective • Supplier PPM • In ternal Rejection	Not Achieved Objective • Customer Rejection • Supplier PPM • Number of customer complaint. • Internal Rejection

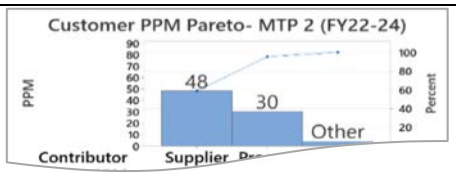
5.1.4 Focused Activities (MTP-3 FY25-27):

Challenges for MTP-3	Analysis of MTP-2	Focused Activities
Sustain 18 MIS IPTV & Offer 36 MIS  Note: IPTV Calculation as per vehicle manufacturing month	Analysis of warranty defects by ownership.  **Inference:** XX contribution is due to Product Planning Responsibility	**A. Prevention of Defect outflow** A1. Inspector capability improvement A2. Early-stage detection through GDAD matrix **B. Prevention of Defect Occurrence** A1. Process stability and capability improvement of SC, CC parameters.

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Reduction in Customer PPM

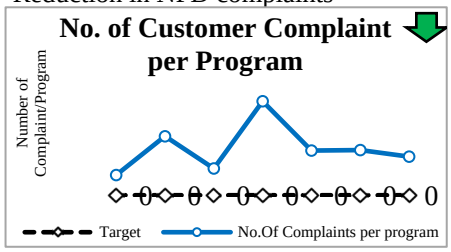




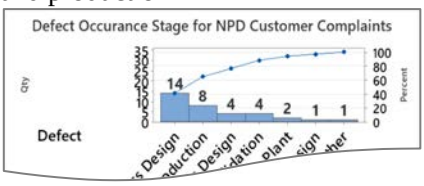
Inference : Top contribution in Customer PPM is due to Supplier parts

A2 Built Quality in Process
a) Improving controls on SC, CC parameters from L1 to L3
b) Defect Reduction using structured problem-solving QC story.
c)Establishment of Kaizen cell under the guidance of TRAD Expats to address chronic issues.
d) Strengthening mfg. process design & development process.
e) Strengthening Internal PTR
f) Installation audits for each new program (IQA2)
g) PDCA in PFMEA from Edition 4 to VDA PFMEA

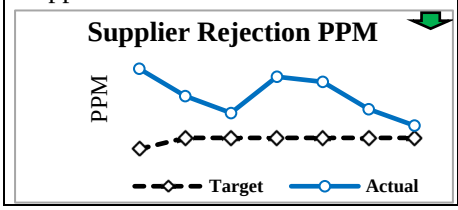
Reduction in NPD complaints



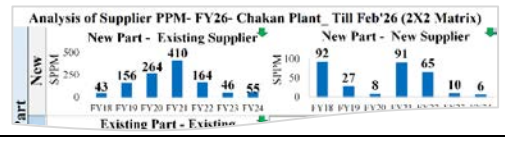
Inference: 64.7% of contributors to NPD complaints are Inhouse Mfg. process design and production



Supplier PPM not met:



Analysis:
Major contributor: Chakan Plant. Existing supplier-Existing parts PPM is highest



C. Supplier capability improvement
C1. Digitization of tool life monitoring and tool preventive maintenance
C2. Supplier capability Improvement

5.1.5. Major Progress (Detailed Explanation) of Focused Activities:

5.1.5.A Prevention of Defect outflow

A1. Inspector Capability Improvement: To prevent defects outflow to customers, Measurement System Analysis (MSA) of inspectors is carried out to ensure that the inspection and judgement process is accurate, consistent, and reliable.

A2. Shifting detection to early stage through GDAD matrix: Analysis was done for the defects passed on to customers with respect to stage of generation of defects (G), logical detection stage (D) & actual detection stage (AD) through GDAD matrix (**Refer Exhibit 5.1.5.A.2**). Actions are implemented to shift the detection stage near to generation stage by using tools like VE **(Refer Exhibit 5.1.5.A.3)**

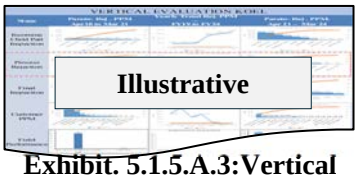


Exhibit. 5.1.5.A.3:Vertical Evaluation

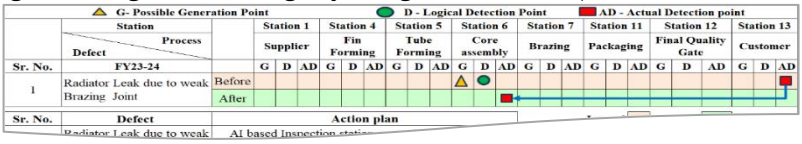


Exhibit 5.1.5.A.2 GDAD Matrix for early detection

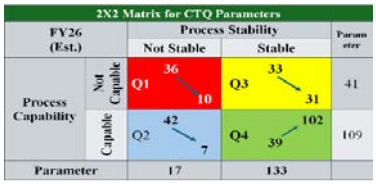


Exhibit 5.1.5.B.1: FY25 to FY26 CTQ Parameter

5.1.5.B Prevention of Defect Occurrence

B1. Process stability and capability improvement of CTQ (SC) parameters: FY24-FY26 Various stability and capability improvement initiative was started by QA to reduce customer complaints and develop organizational capability. As of FY26, 102 CTQ parameters are converted into stable capable as shown in **Exhibit 5.1.5.B.1**

B2. Built Quality in Process (BQiP)

a) Improving controls on CTQ parameters from L1 to L2/ L3

To reduce Customer PPM by improving the controls on CTQ parameters, various Poka-Yoke, Process Interlocks are introduced in manufacturing process. It also includes the actions taken on strengtheing detection within process stage.**Exhibit 5.1.5.B.2** shows no. of parameters converted from L1 to L2 / L3.

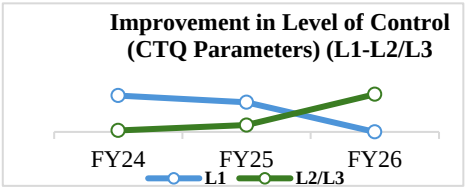


Exhibit 5.1.5.B.2: Conversion of L1 to L2/L3

b) Reduction in defects using structured problem-solving QC story:
By analysing defect data, for high contributors & chronic issues, problems are resolved through Problem solving QC story approach. Total 15 no. of QC storys have been completed in FY26 **(Refer Exhibit 5.1.5.B.3)**. Capability for problem solving is enhanced through education and training.

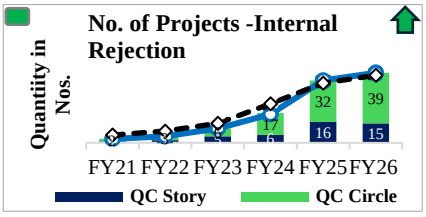


Exhibit 5.1.5.B.3: QC Projects

c) Establishment of Kaizen Cell under the guidance of TRAD Expats to address chronic issues. In FY25, TTR established **Kaizen Cell** under the guidance of T.RAD Expats to address chronic defects through structured problem-solving, with direct reporting to the CEO and strong cross-

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departmental support. Kaizen team completed 7 Nos. of problem-solving QC story projects in FY26. Refer Departmental Chapter 4 for more information.

d) Strengthening mfg. process design & development process: Defects reported in warranty and customer rejection PPM In MTP2 were analyzed by ownership. Defects due to flaws in manufacturing process design development were solved. As learning, standards SOPs are revised and wherever applicable are newly created **(Refer Exhibit 5.1.5. d.1)**.

Deployment of Lessons learnt in Upstream Processes			
#	Details	FY25	FY26
1	No of standard created Newly	3	0
2	No. of Standards modified/ Revised	11	11

Exhibit 5.1.5.d.1: Standards created and revised

e) **Strengthening Internal PTR Process.** To identify the problems in new part development, internal production trial run check sheet No. ME-FT-160 is revised to rev-01 to add detailed verification of design records, process development, child part status, incoming inspection, Poka-Yoke, process control, production process review, traceability, verification of trial results & sub-process verification. This has helped in addressing all problems proactively to avoid customer complaints for New Parts.

g) **PDCA in PFMEA from Edition 4 to VDA PFMEA:** Transformation of existing PFMEA's into new as per VDA guideline is initiated by TTR from Dec-2025. This is helping TTR to identify more potential failure modes and a greater number of causes of these failure modes. It has helped TTR to mitigate the quality risk by proactively identifying prevention and strong detection controls. **Exhibit 5.1.4.B.4** shows both the number of Failure Modes, and the number of Causes has significantly increased after applying the VDA–AIAG PFMEA method.

Matrix Failure Mode vs Causes		
Failure Mode	254	543
Causes	621	1065
	Before	After

Exhibit 5.1.4.B.4: Before and After VDA PFMEA

5.1.5.C Supplier Capability Improvement

C1. Flag System Analysis: Identify top PPM contributing suppliers and parts using flag system and resolution through QC Story approach. **(Refer Exhibit 5.1.5. C.1)**.

C2. Digitization of Tool Life Monitoring and Tool Preventive Maintenance: Major contribution to PPM is due to tooling issues for which digitisation of tooling management is initiated to monitor tool life and advance intimation to supplier for tool preventive maintenance.

C3. Supplier Capability Improvement: Improvement program is kicked off for existing part-existing supplier top contributors (Procedure No.QM/VD/10)

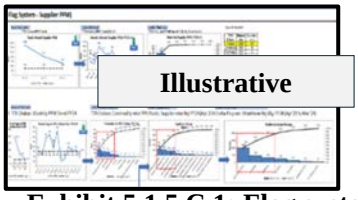


Exhibit 5.1.5.C.1: Flag system analysis

5.1.6. Overall effects:

5.1.6.1 Tangible Effects: For Warranty failure 36 MIS IPTV **Refer chapter 4.1, Exhibit 4.1.9.1.2**.

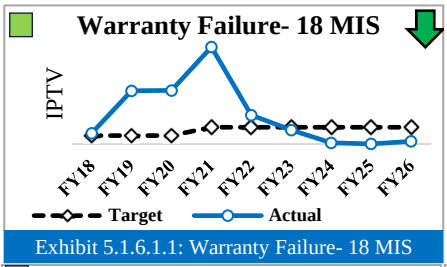


Exhibit 5.1.6.1.1: Warranty Failure- 18 MIS

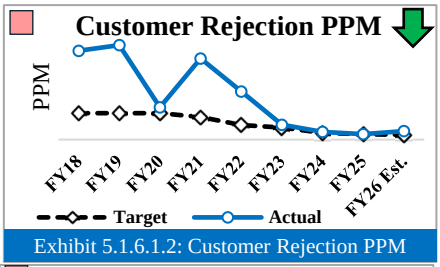


Exhibit 5.1.6.1.2: Customer Rejection PPM

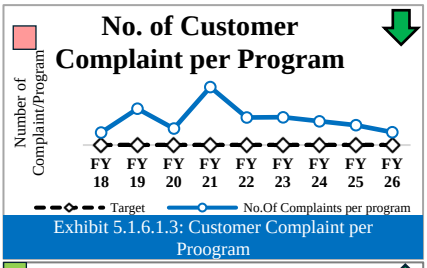


Exhibit 5.1.6.1.3: Customer Complaint per Proogram

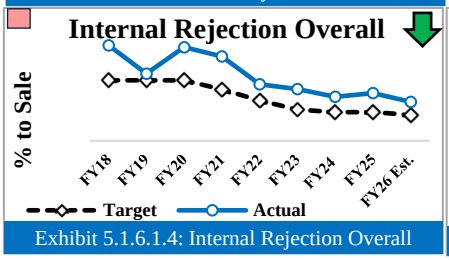


Exhibit 5.1.6.1.4: Internal Rejection Overall

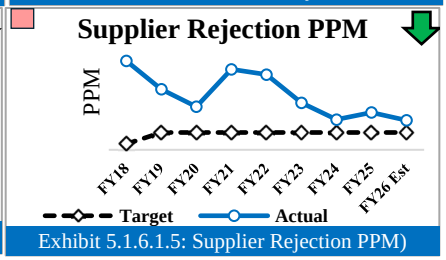


Exhibit 5.1.6.1.5: Supplier Rejection PPM)

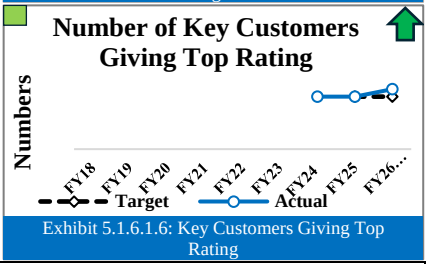


Exhibit 5.1.6.1.6: Key Customers Giving Top Rating

5.1.6.2 Intangible Effects	5.1.7 Organizational Capabilities Acquired:
• Problem solving skill enhanced • Motivation level increased.	• Established a robust Quality Assurance System. • Strengthened quality assurance through SPC, process audits, and preventive controls.

5.1.8 Future Plan:

Remaining Problem (FY26)	Future Plan (FY27)
1. Customer rejection PPM target not achieved. 2. Supplier PPM target not achieved. 3. Average no. of complaints / project target not achieved..	• Further strengthen digital integration of quality, cost, and production systems for real-time monitoring. • Enhance supplier quality development programs to ensure consistent incoming material quality.

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5.2 Title: Management of New Product Development

5.2.1 Background: To achieve business growth, TTR has expanded its product range to enter into new segments. New Product Development (NPD) is **Cross Functional Management (CFM)** activity. NPD process shown in **Exhibit 5.2.1.1** is guided by **Management System Chart (MSC)**. KPIs of NPD are linked to business objectives and strategies. NPD CFM is the integration of different functions like Business Development, Engineering and R&D, Manufacturing Engineering, Quality Assurance, Vendor Development and Operation. NPD programs classification shown in **Exhibit 5.2.1.2**



Exhibit 5.2.1.1: NPD Process

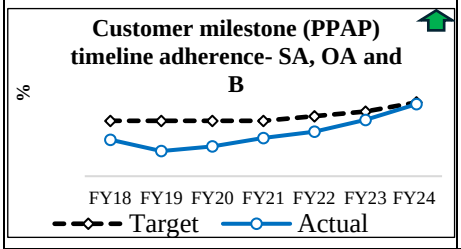
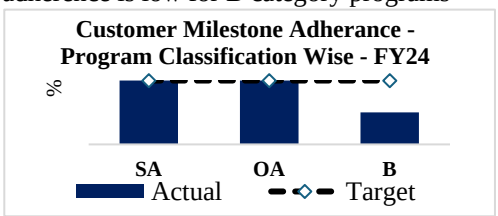
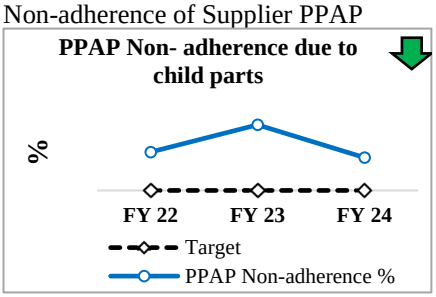
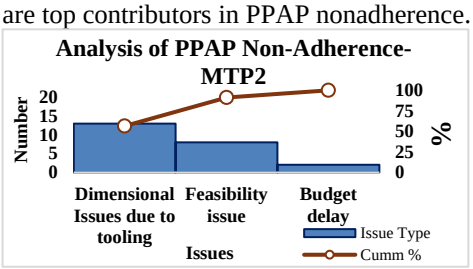
NPD Program Classification				
Particulars	Classification type			
	SA	OA	B	C
Porftfolio/Segment	New/ Existing	New/ Existing	Existing	Existing
Customer	New	New/Existing	Existing	Existing

Exhibit 5.2.1.2: NPD Program Classification

5.2.2 History of Focused Activities:

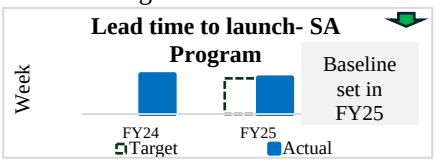
Phase	MTP 1 (FY19-21)	MTP 2 (FY22-24)	MTP 3 (FY25-27)
Objective	Development of Products as per Technology Road Map.	Improve Customer Milestone (PPAP) Timeline adherence	Strengthening of New Product Development Process **(*New Product Development**
Focused Activities	• To develop single point of contact system to make awareness of all stakeholders for all customer requirements. • Implement program wise Cross Functional team structure.	• Benchmarking of NPD Process with JV Partner- T.RAD Management Review • Improve product design using TQM tools like Capturing VOC, QFD, T-Matrix etc.	A. Creation of New Product Development Index B. Strengthening of Gate review system C. Improve quality level of new child parts. D. Improve NPD lead time to launch – SA and OA programs E. Prevention of defect occurrence in NPD
Effects	Customer Milestone adherence improved by ~5%	Customer Milestone adherence improved by ~90%	KPI: ***NPD Index** — UOM: % — T (FY26): 80 — A(FY26): 81
Remaining issues	High NPD Customer Complaints	Customer milestone adherence not met	1. Customer Milestone (PPAP) Timeline adherence target not met. 2.Customer complaint target not met
***KPI Monitoring started from FY26**			

5.2.3 Focused Activities (MTP 3 FY25-27):

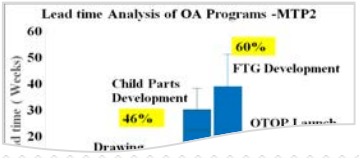
Challenges for MTP-3	Analysis of MTP-2	Focused Activities
Improve customer milestone (PPAP) timeline adherence 	PPAP adherence analyzed for all types of program categories and found that programs adherence is low for B category programs 	**A. Creation of New Product Development Index** **B. Strengthening of Gate Review System** **B1.** Strengthen gate reviews across all programs (SA, OA and B) **B2.** Gate review system extended to 'B' programs.
Non-adherence of Supplier PPAP 	**Inference** Dimensional issues due to tooling are top contributors in PPAP nonadherence. 	**C. Improve Quality Level of New Child parts.** **C1:** PDCA in child parts development process (Involvement of Supplier Quality at Design stage). **C2:** PDCA in PPAP process for addition of PIST and process capability requirement

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Improve Lead time to Launch – SA and OA Program



Inference: FTG Development accounting for 66% of lead time in SA programs and 60% in OA program



D. Improve NPD lead time to launch – SA and OA Program.

D1. Reduction in FTG development lead time by introduction of DFM and improvement in FAT step.

5.2.4 Major progress (Detailed Explanation) of focused activities:

5.2.4.A. New Product Development (NPD) Index: TTR introduced an NPD Index that combines multiple KPIs and provides a single score to monitor and improve NPD performance across programs

5.2.4.B. Strengthening of Gate Review System:

5.2.4.B.1 Strengthen gate reviews across all programs (SA, OA and B): Addition of gate review for equipment development: The SA–Programs (**Refer Exhibit 5.2.1.2:** NPD Program classification) involves major equipment development activities that significantly impact the program's timeline and quality levels. Therefore, a new gate review—Pre-P1—has been introduced to ensure timely and successful equipment development. (**Refer Exhibit 5.2.4.B.1.1,** dashed rectangle box)

Gate review system extended to B-type programs: Gate review learnings from **MTP-2** were extended to B-type programs with effect from FY26 (**Refer Exhibit 5.2.4.B.1.1,** dashed rectangle box)

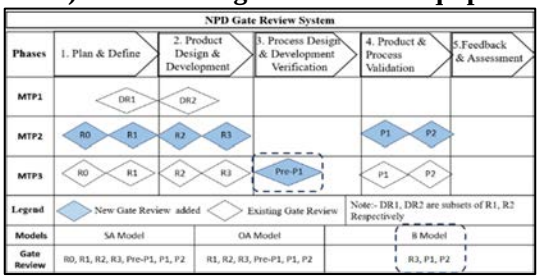


Exhibit 5.2.4.B.1.1: Revision of NPD Gate review

5.2.4.C. Improve Quality Level of Child Parts: Following actions taken by Vendor Development and Supplier Quality team. **Refer Exhibit: 5.2.4.C.1**

5.2.4.C.1: Procedure for Part development revised to include PIST >95% and SC/CC Cpk>1.33 requirements.

5.2.4.C.2. PDCA in child parts development process (Involvement of Supplier Quality at Design stage).

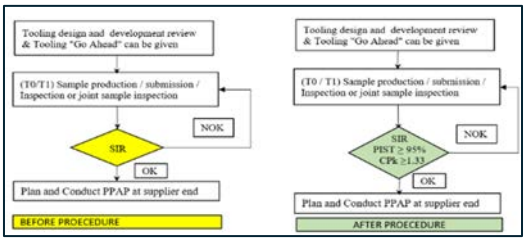


Exhibit 5.2.4.C.1: Part Development procedure.

5.2.4.D. Improve NPD lead time to launch – SA and OA Program: Lead times Target Setting: In FY26, TTR measured actual lead time taken by different class of programs. TTR NPD team listed all the tasks involved in NPD programs and set task-level targets for each program type as standard for future monitoring with effect from FY27 (**Refer Exhibit 5.2.4.D.1**). The lead time targets for each class of programs were calculated by addition of lead time of sequential tasks and higher lead time in case of parallel tasks. (For example, S.N. 3 & S.N. 4 are parallel tasks). With this TTR began monitoring NPD lead time program-wise.

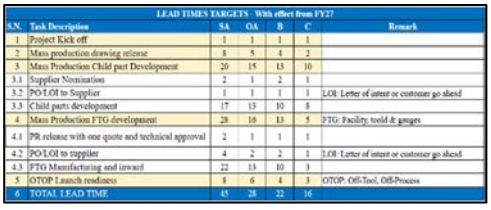


Exhibit 5.2.4.D.1: Lead time Targets

5.2.4.D.1: Reduction in FTG development lead time by introduction of DFM and improvement in FAT step: In process design, DFM (Design for Manufacturing) stage introduced for strong process design and establishing process controls in equipment design. During equiment trials at equipment supplier end, FAT (Factory Acceptance Test) stage improved to add specified continuous dry run. Past learnings captured in FAT check sheet. This has enabled to reduce FTG development lead time by ensuring First Time Right development of FTG.

5.2.5 Overall effects:

5.2.5.1 Tangible Effects

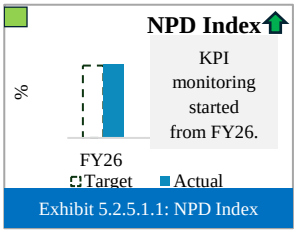


Exhibit 5.2.5.1.1: NPD Index

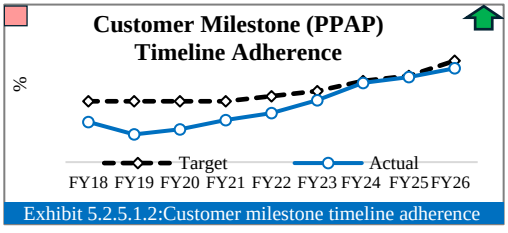


Exhibit 5.2.5.1.2:Customer milestone timeline adherence

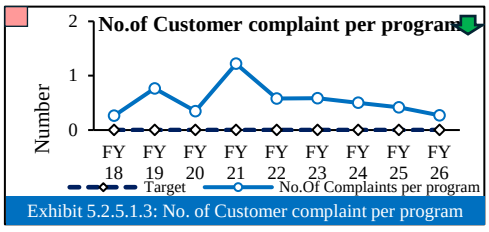


Exhibit 5.2.5.1.3: No. of Customer complaint per program

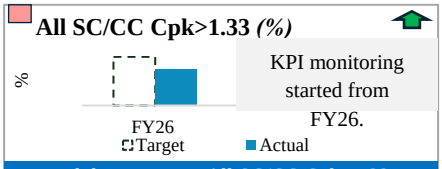


Exhibit 5.2.5.1.5: All SC/CC Cpk>1.33

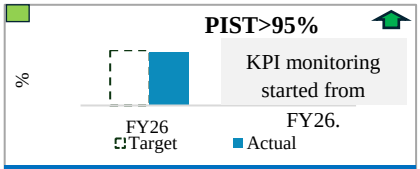


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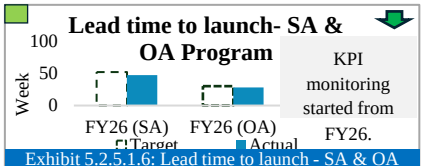


Exhibit 5.2.5.1.6: Lead time to launch - SA & OA Program

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5.2.5.2 Intangible Effects	5.2.6 Organizational Capabilities Acquired
• Strengthening of New product development process. • Enhance Cross Functional Management of NPD programs.	• Better understanding of T.RAD Gate Review System. • Improvement in NPD process through PDCA.

5.2.7 Remaining Issue:	5.2.8 Future Plan
• NPD customer complaint target 0 not achieved.	• Digitalization of NPD processes through PLM software. • NPD programs cost management.

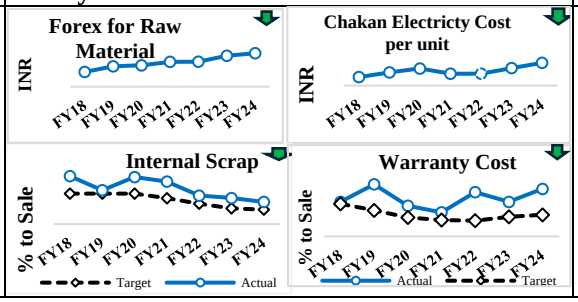
5.3. Title: Management of Cost

5.3.1 Background: During MTP1, BS4 to BS6 transition on 1st April 2020 and COVID-19 lockdown in March 2020, impacted the auto industry. As a result, both customers and TTR experienced severe impacts on their business operations. Due to high capital investment, low sales, high interest costs, coupled with continuously increasing cost of manufacturing, the overall profitability became negative and decreasing further.

5.3.2 Focused Activities (MTP 2 FY22-24): In MTP2, the key objective was to transform TTR from a company making losses to a sustainable profitable company.

- Establishing cost governance management structure.
- Establishing cost management model.
- Cost savings KPI included as important performance in annual goal setting.

5.3.3 Focused Activities (MTP 3 FY25-27): In MTP2, after COVID-19, as the economy began to recover, product demand started increasing. This helped TTR to improve profitability through cost control and cost saving projects. However, TTR still did not meet the profitability targets in MTP2. In MTP3, profitability again came under pressure due to the following challenges.

Challenges	Analysis	Focused Activities for MTP3
a) Raw material price increased b) Variable cost increased: • Electricity Price increased • Natural gas price increased • Internal Scrap target not met • Warranty Cost increased		1. Restructuring of Cost Management Governance 2. Restructuring of Cost Management Model: 3. Promoting cost savings through EBITDA Improvement initiatives. 4. Real time cost visibility through digital dashboard.

5.3.4 Key Cost Contributors Tree: To analyze cost parameters in detail, the cost contributors were analyzed and identified. These key contributors were focused on identification of cost saving projects**.**

5.3.5 Major progress (Detailed Explanation) of focused activities

5.3.5.1 Restructuring of Cost Management Governance: To establish effective cost control and promote cost-saving initiatives, a cost management governance structure was established in MTP2 (**Refer Exhibit 5.3.5.1.1**). Subsequently, in MTP3, TTR developed and implemented a Cost Management System Chart to ensure a cross-functional effort for cost control and continuous improvement. TTR adopted cost management levels (pillars) to structure and manage costs effectively. For each pillar, a Pillar Leader and a Pillar Champions were appointed. Pillar Leaders are responsible for guiding and supporting project leaders to ensure successful project execution, while Pillar Champions coordinate pillar-wise project compilation, submission, and review at the top management level. These levers were expanded from four pillars in MTP1 to eight pillars in MTP3, reflecting the organization's evolving cost management structure **(Refer Exhibit 5.3.5.1.2).**

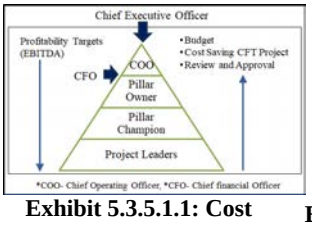


Exhibit 5.3.5.1.1: Cost Management

Pillar No.	Pillar Description (Levers)
Pillar 1	Top Line Improvement
Pillar 2	Engineering
Pillar 3	Materials
Pillar 4A	Operations
Pillar 4B	Manufacturing Engineering
Pillar 4C	Quality Assurance
Pillar 5A	Overheads - I
Pillar 5B	Overhead-II

Added in MTP2 Added in MTP3

Exhibit 5.3.5.1.2: Evolution of EBITDA Cost Saving Pillar

5.3.5.2 Restructuring of Cost Management Model: At the end of MTP-2, revised its cost management model (**Refer Exhibit 5.3.5.2.1**). To generate cost-saving ideas, multiple workshops were organized involving employees, vendors, and service partners. In cases where projects were implemented but targets were not achieved, additional cost-saving initiatives were identified to immediately bridge the gap between targets and actual savings

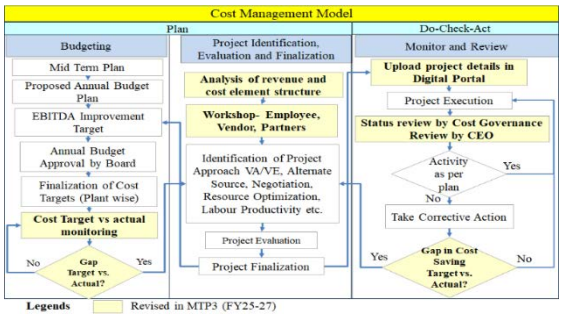


Exhibit 5.3.5.2.1: Cost Management Model

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5.3.5.3 Promote Cost Savings through EBITDA Cost Saving Project: To help project leaders complete projects, the GEAR Methodology (**Refer Exhibit 5.3.5.3.1**) was implemented. In FY25, several cost-saving projects were delayed due to longer return-on-investment periods. In response, TTR developed an evaluation matrix in FY26 to assess project feasibility. Projects were further categorized using a prioritization matrix and Priority 2 projects were selected for implementation (**Refer Exhibit 5.3.5.3.2**), This approach ensured the selection of high-impact, easily implementable projects with faster realization of benefits.

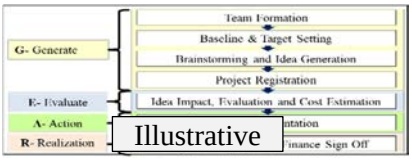


Exhibit 5.3.5.3.1: GEAR Methodology

5.3.5.4. Real time cost visibility through digital dashboard: To track and monitor project status and total cost savings against targets, a digital dashboard (**Refer Exhibit 5.3.5.4.1**) was developed. This portal enables top management to review the real-time progress of projects.

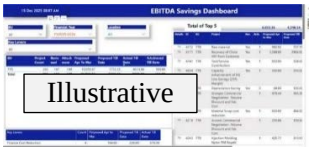


Exhibit 5.3.5.4.1: Digital Real Time Dashboard

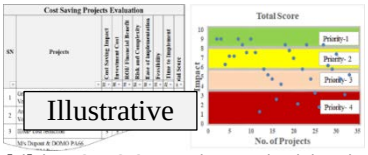
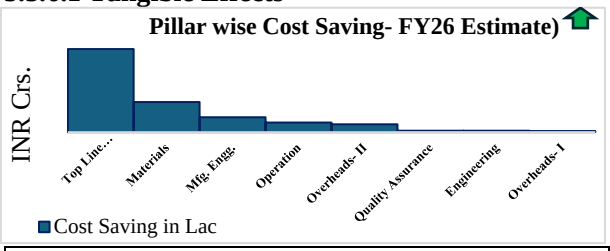


Exhibit 5.3.5.3.2: Project Prioritization and Evaluation Matrix

5.3.6 Overall effects:

5.3.6.1 Tangible Effects



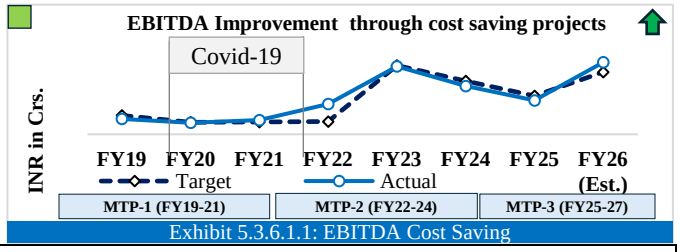


Exhibit 5.3.6.1.1: EBITDA Cost Saving

5.3.6.2 Intangible Effects	5.3.7 Organizational Capabilities Acquired
• Data-driven decision-making enabled through transparency and dashboards • Stronger cross-functional collaboration on cost initiatives	• Project prioritization and evaluation capability using ROI- and feasibility-based matrices • Data-driven cost management capability through real-time dashboards and digital tracking

5.3.8 Remaining Problems and Future Plan.

Remaining Problem	Future Plan
• Industry benchmarking profitability • Lack of predictive analytics	• Orbital shift from “cost saving” to “EBITDA improvement” with use of tools • For effective implementation of projects use of AI for prompt and timely alerts. • Strengthen digital cost intelligence with real-time dashboards and predictive analytics.

5.4 Title: Employee Capability Building

5.4.1 Background: TTR has always prioritized developing its people and strengthening internal talent. With the expansion into new businesses and new technology projects, the demand for advanced skills and new competencies has increased. These specialized projects require highly capable staff and operators who can meet stringent technical requirements. HR is focusing on training, upskilling, and competency-building initiatives. This renewed approach ensures that TTR’s workforce remains future ready and fully aligned with evolving business needs.

5.4.2 History of Focused Activities

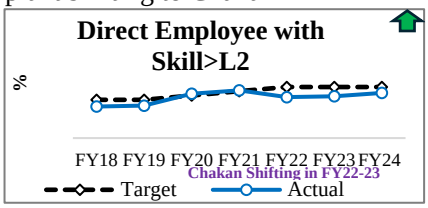
Phase	MTP 1 (FY19-FY21)	MTP 2 (FY22-24)	MTP 3 (FY25-27)
Objective	**Direct Workforce** Achieve direct workforce skill development (Target 55 % **Indirect Workforce** • Achieve Training need identification	**Direct Workforce** • Achieve direct workforce skill development (Target 60 %) **Indirect Workforce** • Achieve Competency Gap Closure- Staff (Target 50%)	**Direct Workforce** • Achieve direct workforce skill development (Target 62%) **Indirect Workforce** • Achieve Competency Gap Closure- Staff (Target 80%)
Focused Activities	**Direct Workforce** • Skill development through on-job training **Indirect Workforce** • Training need identification • Execution of training based on training calendar	**Direct Workforce** • Upgradation of skill evaluation process and Skill development center **Indirect Workforce** • Introduction and execution of 4 academies • Individual wise Competency Mapping	**Direct Workforce** • Upgradation of Skill Levels- Critical Machine • Increase "Single Machine Single Operator" • Multiskilling of direct employee **Indirect Workforce** • Development of Competencies through Training

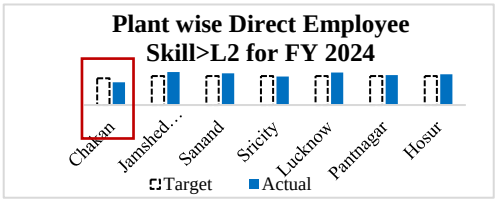
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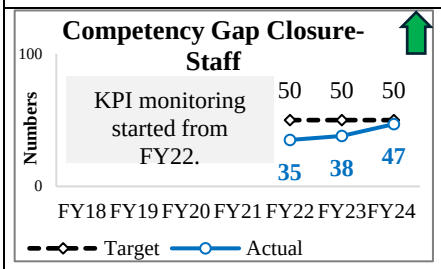
		• Position profile for all positions	• Development of Competencies through 70:20:10 Framework
Effects	**KPI** / **UOM** / **FY21 T** / **FY21 A** Direct Employee with Skill>L2 / % / 55 / 56 Competency Gap Closure- Staff / % / NA / NA	**KPI** / **UOM** / **FY24 T** / **FY24 A** Direct Employee with Skill>L2 / % / 60 / 53 Competency Gap Closure- Staff / % / 50 / 47	**KPI** / **UOM** / **FY26 T** / **FY26 A** Direct Employee with Skill>L2 / % / XX / YY Competency Gap Closure- Staff / % / XX / YY
Remaining Issues	• Skill evaluation not effective • Unstructured process for competency identification	• Competency gap closed through trainings only • Inadequate measurement of competency gaps	• Focus on development of Level 4 direct Employees • Deployment of 70-20-10 across other functions

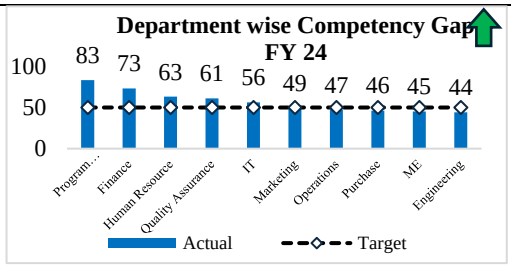
55.4.3 Focused Activities (MTP FY25-27):

Challenges	Analysis	Focused Activities
Direct employee skill level drops due to change in manpower in view of plant shifting to Chakan	Plant wise analysis of direct employee skill shows that at Chakan plant skill level is lowest	**A. Skill Improvement of Direct Employee in Chakan Plant** A1. Upgradation of Skill Levels-Critical Machine A2. Increase "Single Machine Single Operator" A3. Multiskilling of direct employee
		B. Competency Development of Staff B1. Development of Competencies through Training C1. Development of Competencies through 70:20:10 Framework









5.4.4 Major progress (Detailed Explanation) of focused activities:

5.4.4.A- Skill Improvement of Direct Employee in Chakan Plant

5.4.4.A1. Upgradation of Skill Levels-Critical Machine:

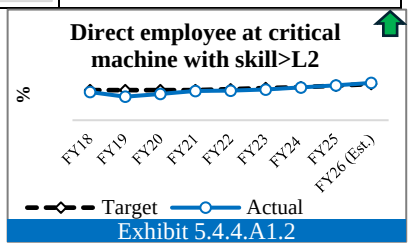


Exhibit 5.4.4.A1.2

A comprehensive skill-upgradation system was introduced to improve direct employee skills on critical machines (**Refer Exhibit 5.4.4.A1.1)**. Mandatory training requirements were standardized by defining mandatory training, preparing annual training calendars, developing structured training modules, and identifying internal trainers. Direct employee undergone focused on-the-job training supported by virtual-reality–based training for assembly processes which will be extended to other processes by FY 27. Additionally, animated process-wise training modules were developed in local languages to improve clarity and effectiveness. This integrated approach significantly enhanced the accuracy, consistency, and readiness of direct employees on critical operations **(Refer Exhibit 5.4.4.A1.2)**

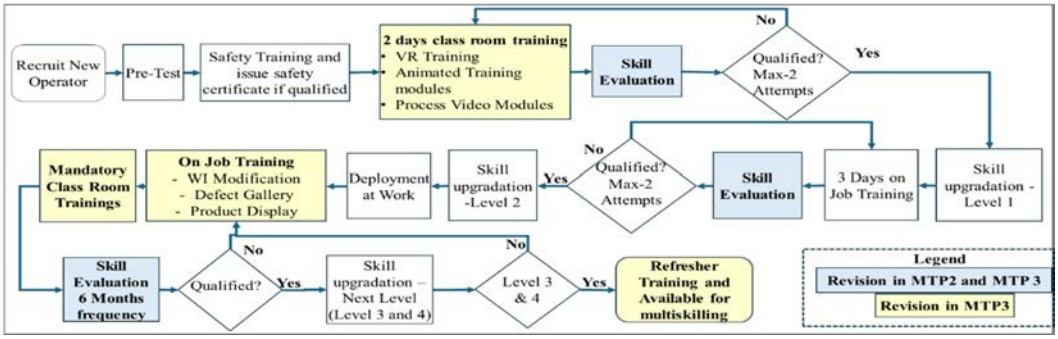


Exhibit 5.4.4.A1.1: Skill-upgradation System- Direct Workforce

5.4.4.A2. Increase Single Machine Single Operator (SMSO): To improve direct workforce skills by increasing SMSO, various initiatives were implemented during MTP3. Initiatives included the hiring of apprentices and associate trainees, extending welfare facilities to the direct workforce, and strengthening attendance and performance-linked incentives. Additionally, reward & recognition programs and QC Circle activities were intensified to boost employee motivation. Employee engagement practices were redesigned, and a structured growth

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platform was developed for the direct workforce to ensure long-term skills upgradation. These initiatives contributed to a consistent rise in SMSO, with actual achievement improving ~20% in FY26

5.4.4.A3. Multiskilling of Direct Employees: A multiskilling framework was implemented to enhance the versatility of direct employees (**Refer Exhibit 5.4.4.A3.1**). The employees were identified for multiskilling based on their skill level in the current workstation. An individual training plan was prepared for such employees to be trained on other workstations. Employees were then deployed for on-the-job training at various stations identified, followed by a skill evaluation after three days of on-the-job training. Successful employees were upgraded in the skill matrix for multiskilling, enabling need-based deployment across workstations. This approach resulted in steady improvement in multiskilled manpower (**Refer Exhibit 5.4.4.A3.2**).

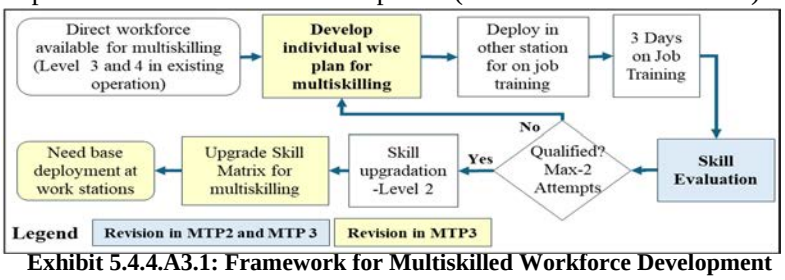


Exhibit 5.4.4.A3.1: Framework for Multiskilled Workforce Development

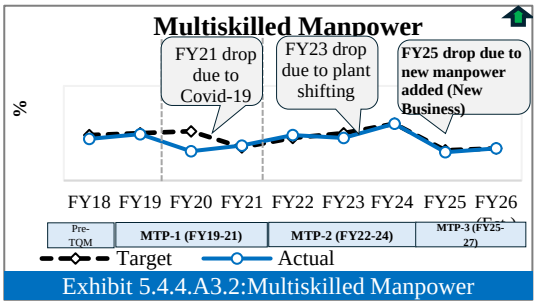


Exhibit 5.4.4.A3.2:Multiskilled Manpower

5.4.4.B- Competency Development of Staff: A competency development process was implemented, evolving from nomination-based training in MTP1 to a more systematic and competency-driven approach in MTP2 and MTP3 (**Refer Exhibit 5.4.4.B.1**). Key enhancements included the introduction of four training academies, competency mapping, preparation of competency dictionaries, and role-based proficiency profiling (**Refer Exhibit 5.4.4.B.2** Learning & Development Matrix). With improved methods for gap analysis and defined closure targets, the organization established a more robust framework for building future-ready skills across all positions and measuring the Capability Index.

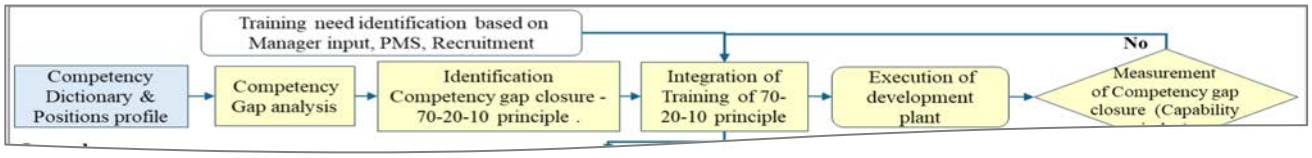


Exhibit 5.4.4.B.1: Competency Development Process

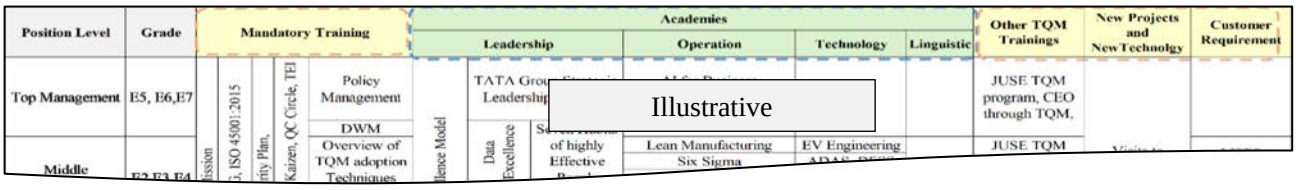


Exhibit 5.4.4.B.2: Learning & Development Matrix

5.4.5 Overall effects:

5.4.5.1 Tangible Effects

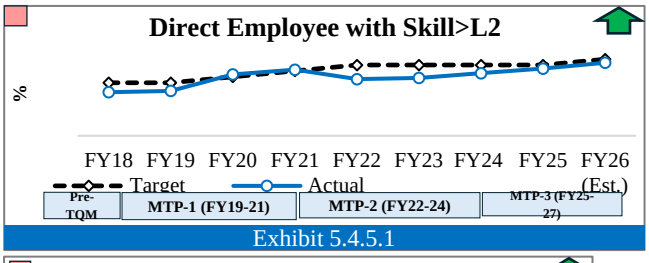


Exhibit 5.4.5.1

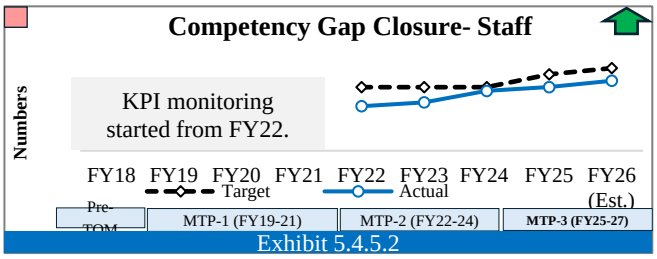


Exhibit 5.4.5.2

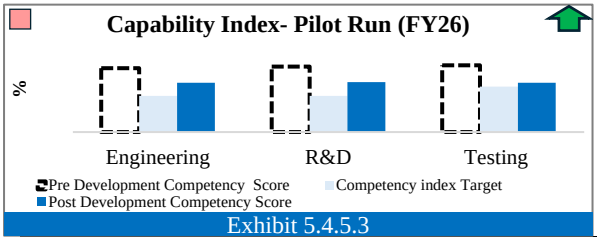


Exhibit 5.4.5.3

5.4.5.2 Intangible Effects:

- Enhanced workplace agility and collaboration due to multiskilling and cross-functional capability building.

5.4.6 Organizational Capabilities Acquired:

- Structured, competency-driven development system
- Robust capability measurement mechanism

5.4.7 Future Plan:

Objective	Future Plan
Skill Improvement of Direct Employees	• Sustain and expand SMSO and multiskilling across different sections • Integrate VR-based and digital training for advanced skills
Competency Development of Staff	• Deployment of 70:20:10 model across the entire organization for capability index measurement.

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5.5 Title: Management of Digitalization

5.5.1 Background:

In MTP1, TTR focused on strengthening daily IT operations and computer hardware support. In MTP2, the focus shifted to building a resilient IT-enabled infrastructure that ensures uninterrupted system availability. This has laid a foundation for TTR to transition from an IT-enabled organization into a digitally driven organization in MTP3.

5.5.2 Focused Activities (MTP3 FY25-27): In MTP-3, TTR focuses on strengthening its digital capabilities as a key enabler for the business by helping teams make faster decisions, work more efficiently, and gain real-time business visibility. The key focus is to bring systems, people, and data together so that digital solutions are well-integrated, widely adopted, and used effectively for decision-making

Phase	MTP-1 (FY19-21)	MTP-2 (FY22-24)	MTP-3 (FY25-27)
Objective	Strengthen daily IT operations and hardware support	Building a resilient IT enabled infrastructure	Transition to a digitally driven organization
Focused Activities	Replacement of aged desktops and laptops.	Get ISO 27001:2022 certification for information security	Establish cross-functional digital governance structure
	Upgradation of SAP to S4 HANA	Implementation of Firewall	Evaluate projects based on business priorities and benefits
Effects	Compliance with hardware requirements	Critical system availability: 99%	Projects met defined evaluation criteria: 83%
Remaining Issues	Poor information security and high internal customer complaints	Critical Systems uptime.	Unclear digital priorities and benefits

5.5.3 Focused Activities (MTP-3 FY25-27)

Challenges for MTP-3	Analysis of MTP-2	Focused Activities
Governance and cross-functional alignment gaps.	Digitalisation projects were being deployed without appropriate cross functional evaluation.	A. Development of Cross-Functional Structure for Digitalization
Unclear digital priorities and value realization.	There were 67 nos. of digitalization projects requested. 12 projects are rejected due to non-alignment to business value.	B. Develop software application to evaluate projects based on business priorities and benefits
Execution maturity and delivery predictability.	Execution predictability was not institutionalized.	C. Development of Digitalization Roadmap D. Digitalization Project execution

5.5.4 Major progress (Detailed Explanation) of focused activities:

5.5.4.A: Development of Cross-Functional Structure for Digitalization: To align the organization with the digitalization roadmap, ensure smooth coordination across functions and achieve desirable business benefits a cross-functional Digitalization structure (**Refer Exhibit 5.5.4.A.1**) was established along with a Management System Chart defining roles and responsibilities.

A Steering Committee led by the CEO was formed to approve the roadmap, allocate resources, and review progress. A core team from IT, Manufacturing Engineering, and Engineering & R&D was established to develop the roadmap and support project execution. All departments were involved in providing input on project evaluation, data needs, process requirements, and expected outcomes. A Project Champion was assigned to each project to lead implementation and coordinate with stakeholders. Periodic reviews were defined at all levels to monitor project progress, roadmap milestones, and business results.



Exhibit 5.5.4.A.1: Cross Functional Structure for Digitalization

5.5.4.B: B. Develop software application to evaluate projects based on business priorities and benefits: In line with the digitalization roadmap, the core team evaluated all proposed projects, along with inputs from departmental user teams, using criteria such as business impact, strategic alignment, financial benefits, urgency, risk, feasibility, and time to implement (**Refer Exhibit 5.5.4.B.1**) These projects were then assessed using a software application (**Refer Exhibit 5.5.4.B.2**).

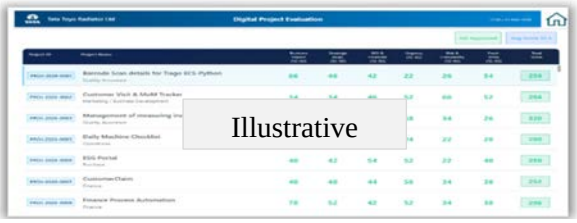


Exhibit 5.5.4.B.1: Project Evaluation Criteria

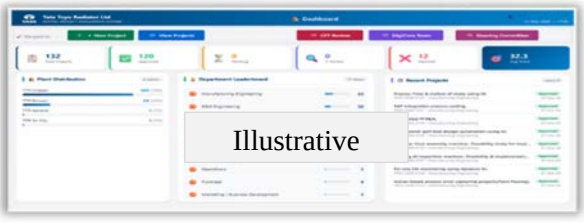


Exhibit 5.5.4.B.2: Digitalization Dashboard

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5.5.4.C: Development of Digitalization Roadmap: The digitalization roadmap was developed through a structured assessment of TTR's current digital maturity and future business needs. Based on this assessment, the roadmap was organized into phased MTP stages to guide TTR's digitalization progress in a clear and systematic manner.

5.5.4.D: Digitalization Project execution: TTR developed a structured process to ensure the on-time execution of digital projects (**Refer Exhibit 5.5.4.D.1**) A digital project is executed by first defining the problem, expected outcomes, and process requirements with the user department. A cross-functional team, led by a Project Champion, works with IT and relevant functions to design the solution, prepare data, and ensure system readiness. The project is then developed, tested, and validated in stages, followed by user training and deployment. Progress is reviewed periodically to monitor milestones, address issues, and ensure the project delivers the expected business results.



Exhibit No: 5.5.4.D.1: Flow Chart for Project Execution

5.5.5 Overall effects:

5.5.5.1 Tangible Effects

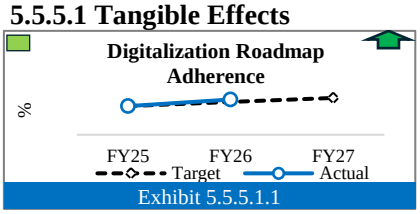


Exhibit 5.5.5.1.1

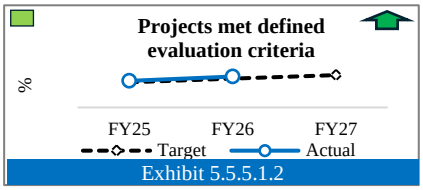


Exhibit 5.5.5.1.2

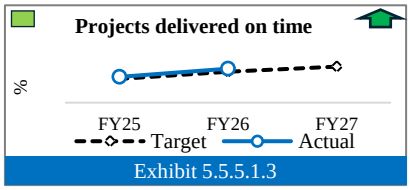


Exhibit 5.5.5.1.3

5.5.5.2 Intangible Effects:	5.5.6 Organizational Capabilities Acquired:
• Improved decision-making culture • Enhanced cross-functional collaboration • Higher transparency and accountability	• Real-time visibility of operations and performance • Faster, data-driven decision-making • Seamless information flow through integrated systems

5.5.7 Remaining Problems & Future Plan:

Remaining Problem	Future Plan
• Processes are not fully integrated end to end and still rely on manual steps. • Digital benefits are not consistently measured at the organizational level.	• Eliminate manual interfaces through complete end-to-end digitalization. • Institutionalize KPI-based benefit tracking and capability building.

6: Overall Effects

6 Overall Effects: TTR has introduced TQM as a vehicle to achieve its Vision and Mission. For the objective identified during MTP 3 in chapter 2, following exhibits show the effects.

6.1 Tangible effects:

6.1.1 Effects of Exceeding Customer Expectations:

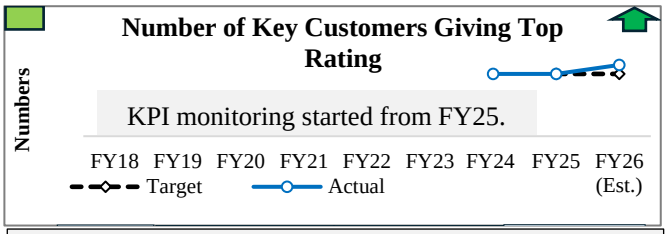


Exhibit 6.1.1.1: Objective is changed from previous MTP and focus on top revenue contributing customers from FY25 while meeting rating criteria for other customers.

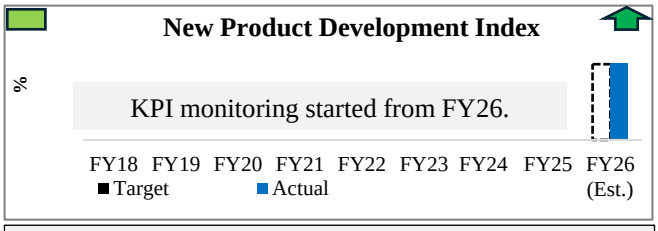


Exhibit 6.1.1.3: Addition of this new objective is done to bring more maturity to new product development process.

6.1.2 Effects of Best-in-Class Heat Exchange Solutions

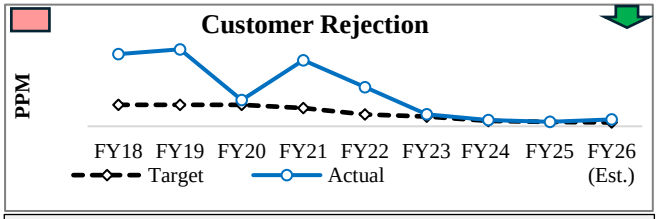


Exhibit 6.1.2.1: Customer rejection is not meeting the target due to supplier parts and abnormalities in manufacturing processes.

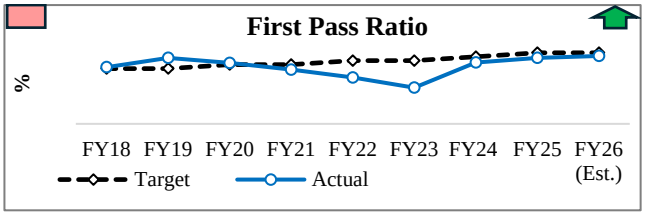


Exhibit 6.1.2.2: First pass ratio is on improving trend by implementation of proactive process controls through PFMEA and adherence to standards.

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6.1.3 Effects of Preservation of Environment

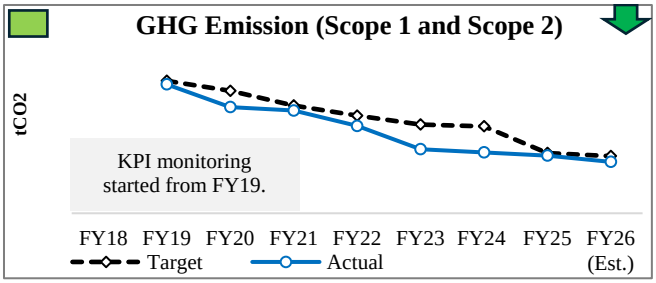


Exhibit 6.1.3.1. GHG emission target is met and TTR is received gold award from customer for ESG contest.

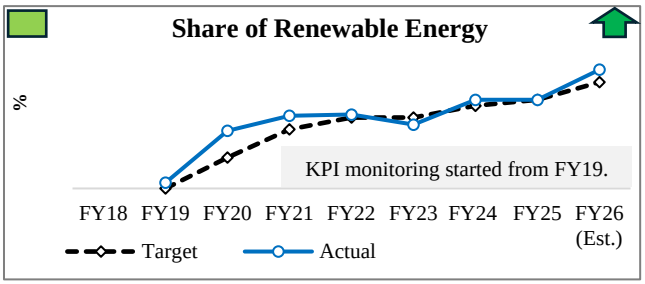


Exhibit 6.1.3.2. Share of renewable energy increased by addition of roof mounted solar with allowable maximum capacity.

6.1.4 Betterment of Society

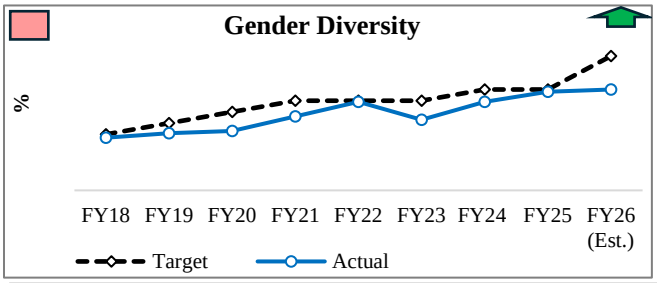


Exhibit 6.1.4.1 Gender diversity target not met. Action plan in terms of recruitment, retaining and growth is available.

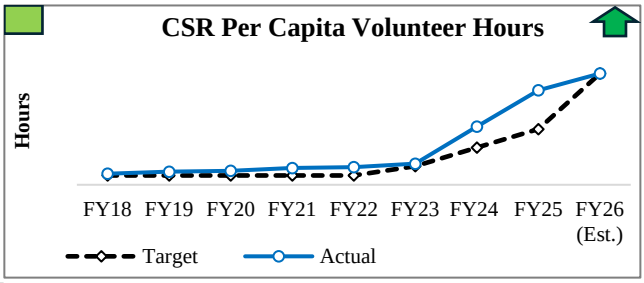


Exhibit 6.1.4.2. CSR per capita target met by promoting volunteering through recognition.

6.1.5 Effects of Delivering Value to all Stakeholders

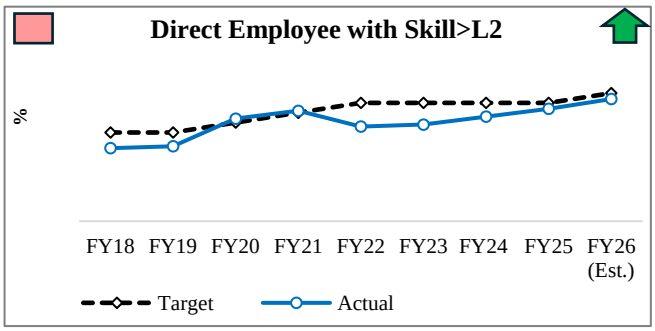


Exhibit 6.1.7.3 Skill level >2 is improving by increasing SMSO, Development of training modules like virtual reality and adding dedicated trainers.

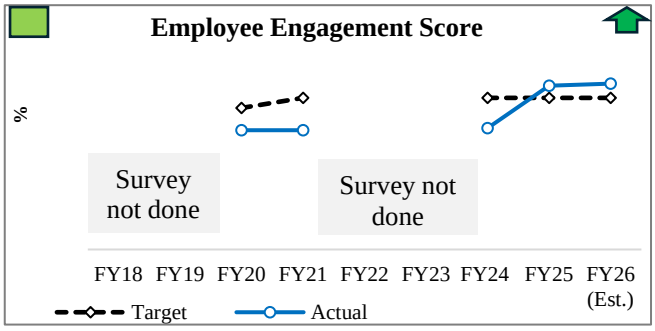


Exhibit 6.1.7.4 Employee engagement score improved through Total Employee Involvement, Actions on low scoring areas and engagement through various initiatives.

6.1.8 Effects of Safety:

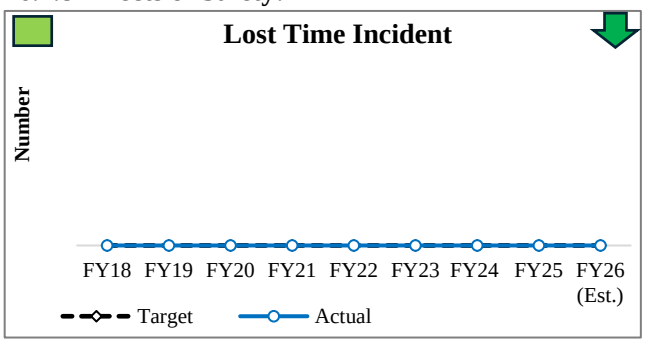


Exhibit 6.1.8.1 TTR has maintained 0 LTI performance over the years as a result of a strong safety management initiative of focusing on Unsafe Observation and a strong score.

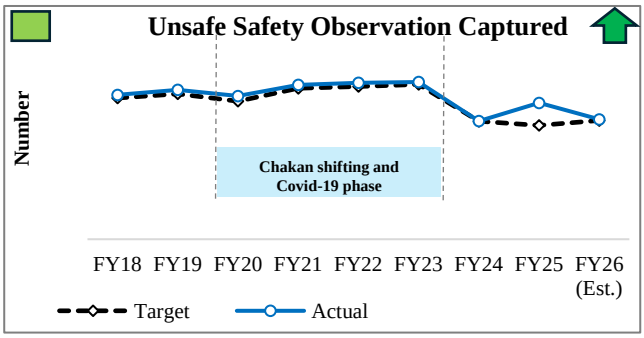


Exhibit 6.1.8.2 Unsafe safety observations are on decreasing trend due to maturity of safety practices.

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6.2 Intangible effects:

- Stronger strategy execution through effective policy management.
- Improved quality culture and better understanding of TQM tools.
- Higher employee engagement and morale.
- Improved cross-functional collaboration.
- Increased adaptability to change and market needs.

6.3 Organizational Capabilities Acquired:

- Advanced Product Validation Capability through RLDA and vehicle-level testing.
- Capability Development for Manufacturing of new-generation heat exchangers.
- Strengthened NPD governance through an improved phase-gate review system.
- Enhanced digital capability for real-time monitoring and data-driven decisions.
- Structured cost governance capability with clear roles, reviews, and accountability.
- Project prioritization and evaluation capability using ROI- and feasibility-based matrices.
- Real-time visibility of operations and performance.

7. Future Plan

7.1. Introduction: Tata Toyo Radiator Ltd. has embraced Total Quality Management (TQM) as a way of working and intends to continue using and deploying a wide range of tools, techniques, and methodologies across all areas of its operations. This transformation journey is focused on understanding and fulfilling customer specific requirements, responding effectively to market volatility, and consistently delivering superior value. Collectively, these efforts aim to position Tata Toyo Radiator as the preferred radiator supplier for customers globally.

With the successful completion of new generation heat exchanger manufacturing, greatly strengthening its capability and giving it a strong first-mover advantage. Building on this progress, TTR is now working to further strengthen its leadership in thermal management solutions by expanding its product portfolio through co-development (design and manufacturing) with customers.

Key Business Objectives	Future Plan (FY28-30)
Customer Centricity: Exceeding Customer Expectation	• Offer better value proposition to customer- Product development • NPD lead time reduction for – All types of programs. • Improve Customer PPM • Reduction of warranty IPTV for 36 MIS to be improved • Improve responsiveness to customer
Employee Capability Improvement (Future ready organization)	• Develop employee capability using the 70:20:10 principle. • Enhance direct employee skills through multiskilling and expand the use of virtual-reality and simulation-based training. • Improve gender diversity by creating a supportive work environment and implementing a structured development plan for female employees.
ESG	• Expand Energy Management Systems (EMS) for real time monitoring. • Implement Life Cycle Assessments (LCA) for all critical products. • Expand solar plants across Chakan, Sanand, Sricity, and Pantnagar locations

7.1 Future Plans for TQM Practice at Tata Toyo Radiator:

- Annual business plan review frequency to be increased to half yearly
- Improve employee capabilities to recognize and address abnormalities, enhancing the effectiveness of daily work management practices across all departments and plants
- Enhancing people's capability in the application of advanced statistical tools through the development of "statistical experts".
- Digitalization of TQM vehicles across all business functions.
- Nurturing TQM culture in the organization as way of working in TQM excellence

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２０２６年度

デミング賞委員会　事務報告

デミング賞委員会事務報告

デミング賞委員会

2026年度デミング賞委員会は1月1日付で委員，顧問のご委嘱を申し上げ，その活動は1月20日の第1回デミング賞委員会の開催から始まりました．委員会の業務として，規定に従って運営委員会と3つの各委員会のもとそれぞれの委員会活動が行われました．

また，デミング賞各賞候補者の推薦・応募を広くもとめ，これに基づいて各賞の選考が行われました．その結果，主要業務は本日の受賞報告講演会，授賞式をもって終了いたします．この間の委員，顧問各位のご尽力ならびに日本経済新聞社をはじめ各方面から寄せられました絶大なるご協力に対しまして深く感謝申し上げます．

以下，2026年度デミング賞委員会の事務報告を申し上げます．

1．委員会の構成

⑴ 2026年1月1日筒井委員長から，委員88名，顧問120名をご委嘱いたしました．

委員長は一般社団法人日本経済団体連合会 会長 筒井義信が，副委員長は旭化成株式会社 取締役会長／一般財団法人日本科学技術連盟 会長 小堀秀毅が，セクレタリーは一般財団法人日本科学技術連盟 顧問 中島宣彦が，それぞれ務めることになりました．

その後，中島セクレタリーは6月30日付でセクレタリーを退任し，後任には一般財団法人日本科学技術連盟 理事 島田尚徳が就任いたしました．

なお，委員，顧問に異動がありましたので，11月1日現在の名簿を次に掲げます．

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2026年度デミング賞委員会名簿

※ 2026 年度は，・2000 年以後のデミング賞受賞組織に顧問と委員を委嘱
・1999 年以前のデミング賞受賞組織に顧問を委嘱
・デミング賞大賞（旧：日本品質管理賞）受賞組織に顧問と委員を委嘱
しております．
※〇印は昨年度と変更のあった方ならびに新たに本年度から委嘱された方

（敬称略，2026 年 11 月 1 日現在）

委員長	筒井義信	一般社団法人日本経済団体連合会 会長
副委員長	小堀秀毅	一般社団法人日本経済団体連合会 副会長 一般財団法人日本科学技術連盟 会長
セクレタリー	島田尚徳	一般財団法人日本科学技術連盟 理事

委員（受賞組織関係者，組織名五十音順）

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〃	松井克行	株式会社アイシン　グループ品質本部 本部長
〃	新村　仁	アイシン軽金属株式会社　執行幹部
〃	藤本　泰	アイシンシロキ株式会社　Executive Advisor
〃	樋口義晴	アイシン高丘株式会社　執行役員
〃	磯村直輝	アイホン株式会社　執行役員 管理本部長
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〃	奥田正直	株式会社竹中工務店　取締役専務執行役員
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〃	岡　田　浩　二	日本電気株式会社　サプライチェーンコンダクター統括部 シニアディレクター
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〃	田　井　啓　文	名北工業株式会社　TSS 事業プロジェクト　部長

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〃	大橋徹二	株式会社小松製作所　特別顧問
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〃	小原好一	前田建設工業株式会社　顧問
〃	梶原千里	静岡大学　准教授
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〃	木内正光	玉川大学　教授
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〃	鈴木秀男	慶應義塾大学　教授
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〃	棟近雅彦	早稲田大学　教授
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〃	山本涉	慶應義塾大学　教授
〃	米岡俊郎	株式会社 P&Q コンサルティング　代表取締役
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〃	渡辺喜道	山梨大学　教授

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顧問（組織名五十音順）

顧問	大下守人	アート金属工業株式会社　代表取締役社長
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〃	長谷川恭之	株式会社ＩＨＩ　執行役員　資源・エネルギー・環境事業領域 副事業領域長（兼）原子力 SBU 長
〃	加藤貴己	愛三工業株式会社　社長　経営役員
〃	吉田守孝	株式会社アイシン　取締役社長
〃	竹本和雄	アイシン機工株式会社　取締役社長
〃	古村清志	アイシン軽金属株式会社　取締役社長
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〃	奥田誠	アイシン高丘株式会社　取締役社長
〃	立松敬朗	株式会社アイシン福井　取締役社長
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〃	市川周作	アイホン株式会社　代表取締役会長
〃	小堀秀毅	旭化成株式会社　取締役会長
〃	本村健太	株式会社麻生　飯塚病院　院長
〃	秋山晃	株式会社アドヴィックス　取締役社長
〃	国谷一彦	株式会社安藤・間　代表取締役社長
〃	湊宏司	株式会社イトーキ　代表取締役社長
〃	矢野文雄	内野建設株式会社　代表取締役
〃	町田敏之	エクシオ・デジタルソリューションズ株式会社　ECI カンパニー　社長
〃	羽下修	ＮＥＣプラットフォームズ株式会社　執行役員
〃	内藤大介	エヌティーテクノ株式会社　代表取締役社長
〃	稲葉陽子	株式会社ＮＴＴデータグループ　部門執行役員 技術革新統括本部長
〃	佐藤恭司	株式会社ＭＣシステムズ　代表取締役社長
〃	加來正年	王子ホールディングス株式会社　代表取締役会長
〃	小田井勇樹	株式会社オティックス　代表取締役社長
〃	菅原公一	株式会社カネカ　代表取締役会長
〃	天野正三	カヤバ株式会社　品質本部　上席常務執行役員
〃	森望	関西電力株式会社　取締役代表執行役社長
〃	石田雅資	株式会社キャタラー　代表取締役社長
〃	石井康彦	京三電機株式会社　取締役社長
〃	山口真輝	株式会社共和工業所　代表取締役社長
〃	Sumit Mishra	Country Director Global Indian International School, Global Schools Group（Japan and Korea）
〃	角岡昭典	株式会社コーリツ　代表取締役社長
〃	小島栄二	小島プレス工業株式会社　取締役社長
〃	大幸利充	コニカミノルタ株式会社　取締役 代表執行役社長 兼 CEO
〃	今吉琢也	株式会社小松製作所　代表取締役社長 兼 CEO
〃	塚本健太	コマニー株式会社　代表取締役 社長執行役員
〃	大桃満	株式会社コロナ　代表取締役社長
〃	山本憲男	埼玉機器株式会社　代表取締役社長
〃	大月孝宏	サンデン株式会社　総務本部 本部長
〃	西海栄一	三輪精機株式会社　代表取締役社長
〃	小西達也	株式会社ＧＳユアサ　品質統括部 部長
〃	鳥居勝実	株式会社ジーシー　上席執行役員 兼 CQMO
〃	広瀬政之	ＪＦＥスチール株式会社　代表取締役社長
〃	近藤禎人	株式会社ジェイテクト　取締役社長
〃	新村達也	清水建設株式会社　取締役社長
〃	佐藤朋由	ジヤトコ株式会社　代表取締役社長 兼 CEO

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顧問	関　根　一　志	常磐興産株式会社　取締役　社長執行役員
〃	秋　谷　文　男	信越化学工業株式会社　代表取締役会議長
〃	北　山　修　二	神鋼鋼線工業株式会社　代表取締役社長
〃	井　上　　治	住友電気工業株式会社　社長
〃	髙　下　貞　二	積水化学工業株式会社　代表取締役会長
〃	山　田　昌　也	株式会社セキソー　取締役社長
〃	田　尻　哲　也	株式会社ダイヘン　代表取締役会長
〃	小　野　有　理	ダイヤモンドエレクトリックホールディングス株式会社　代表取締役社長 CEO
〃	芦　谷　三　郎	ダイヤモンド電子株式会社　代表取締役会長 兼 社長
〃	丁　野　成　人	株式会社竹中工務店　取締役社長
〃	武　部　一　顯	株式会社武部鉄工所　代表取締役社長
〃	原　田　明　久	田辺ファーマ株式会社　代表取締役 執行役員 CEO
〃	本　多　圭　介	中越合金鋳工株式会社　代表取締役副社長
〃	神　津　　直	中国化薬株式会社　代表取締役 社長
〃	森　　雅　彦	DMG 森精機株式会社　取締役社長
〃	林　　新之助	株式会社デンソー　代表取締役社長
〃	近　藤　耕　治	株式会社デンソーエレクトロニクス　代表取締役社長
〃	草　木　　宏	東海化成工業株式会社　代表取締役社長
〃	二之夕　裕　美	株式会社東海理化　代表取締役社長　社長執行役員
〃	島　田　太　郎	株式会社東芝　代表取締役 社長執行役員 CEO
〃	田　村　信　也	ＴＯＴＯ株式会社　代表取締役社長執行役員
〃	野　口　信　吾	東洋ガラス株式会社　代表取締役社長
〃	大　塚　　穣	東陽精機株式会社　代表取締役社長
〃	幡　野　智　彦	東レ株式会社　上席執行役員
〃	安　田　　洋	豊田合成株式会社　取締役副社長
〃	豊　田　章　男	トヨタ自動車株式会社　取締役会長
〃	長　木　哲　朗	トヨタ自動車九州株式会社　代表取締役 取締役社長
〃	石　川　洋　之	トヨタ自動車東日本株式会社　取締役 社長
〃	松　尾　勝　博	トヨタ車体株式会社　代表取締役社長
〃	松　浦　秀　樹	トヨタ紡織株式会社　品質本部　本部長
〃	西　村　　祐	トヨタホーム株式会社　代表取締役社長
〃	伊　藤　浩　一	株式会社豊田自動織機　代表取締役社長
〃	川　村　茂　之	日本化薬株式会社　代表取締役社長
〃	飯　田　展　久	株式会社日本経済新聞社　代表取締役社長
〃	松　尾　敏　夫	株式会社日本製鋼所　代表取締役社長
〃	今　井　　正	日本製鉄株式会社　代表取締役社長
〃	阿　賀　英　司	日本曹達株式会社　代表取締役社長
〃	遠　藤　信　博	日本電気株式会社　特別顧問
〃	城　地　秀　佳	パナソニックインダストリー株式会社　品質保証センター　センター長
〃	仲　　美　雄	浜名湖電装株式会社　代表取締役社長
〃	大　石　晃　裕	株式会社日立製作所　専門理事 品質保証統括本部 統括本部長
〃	Satyakam Arya	日野自動車株式会社　取締役社長・CEO
〃	中　村　成　利	株式会社不二越　代表取締役社長執行役員
〃	藤　田　尚　寿	富士フイルムビジネスイノベーション株式会社　執行役員　デバイステクノロジー事業本部　オフィス商品開発，品質保証 管掌
〃	高　田　　勝	フジミ工研株式会社　代表取締役社長
〃	森　田　泰　博	株式会社ブリヂストン　代表執行役 Global CEO
〃	森　平　英　也	古河電気工業株式会社　代表取締役社長
〃	塩　谷　泰　司	豊生ブレーキ工業株式会社　取締役社長
〃	加　藤　伸　夫	北陸工業株式会社　代表取締役社長
〃	前　田　操　治	前田建設工業株式会社　代表取締役社長

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顧問	伊藤正義	株式会社前田製作所　代表取締役社長
〃	土川久典	丸和電子化学株式会社　取締役社長
〃	藤井　司	マレリ株式会社　代表取締役社長
〃	中井良和	三菱電機株式会社　常務執行役 CPO, CQO
〃	長谷川裕恭	株式会社メイドー　代表取締役会長
〃	福西康和	名北工業株式会社　代表取締役社長
〃	大塚丈徳	株式会社安川電機　執行役員 品質サービス本部長
〃	山岡健人	ヤンマーホールディングス株式会社　代表取締役会長 兼 代表取締役社長
〃	谷　典幸	株式会社ユニバンス　取締役 副会長
〃	江山創一	理研鍛造株式会社　代表取締役 社長
〃	中田克典	株式会社リコー　コーポレート専務執行役員 RICOH Digital Products BU プレジデント
〃	片岡　健	ルネサスエレクトロニクス株式会社　執行役員
〃	新保尚文	株式会社レゾナック・ホールディングス　執行役員

（112 名）

顧問（海外受賞組織関係者，組織名アルファベット順）

顧問	C Thomas Mathew	Unit Head Apollo Tyres Limited, Chennai Plant
〃	Mirza Asif Beg	Senior executive Director Supply Chain management, Quality Assurance , Chief - TQM Directorate Asahi India glass Limited
〃	Nagarajan E	Head- Operation Strategy & Business Excellence Ashok Leyland Limited Pantnagar Plant Ashok Leyland Limited Hosur Unit II.
〃	Charoen Ruengwilai	President Bangkok Komatsu Company Limited
〃	V.Balajikrishna	President & Head Foundry Brakes India Private Limited, Foundry Division
〃	Noboru Sato	President Cataler North America Corporation
〃	Shingo Sakagami	Chairman of the Board, General Manager Cataler (Wuxi) Automotive Environment Technology Company Limited
〃	Jignesh Gopal Sharda	Senior Vice President Quality, Sustainability and Business Excellence CEAT Limited
〃	Piyachok Piyangsu	Senior Vice President CPRAM Company Limited(Ladkrabang)
〃	Charoen Kaowsuksai	Senior Advisor to Executive Officer CPRAM Company Limited, Ready to Eat Food Business
〃	Ramesh Ponnuswami	Executive President – Operations & EBS Elgi Equipments Limited
〃	Richard Santoro	Director of Quality Management GC America Inc.
〃	Norihiro Araki	President GC DENTAL (SUZHOU) CO., LTD.
〃	Uday Mahajan	Vice President & National Head - Process Excellence and TQM Office Indus Towers Limited
〃	N. Sai Rama Krishna	Vice President / Head - Iron Complex, Business Excellence & Sustainability JSW Steel Limited, Salem Works
〃	Abhi Anant Kinlekar	DGM - HEAD TQM & BE JSW Steel Limited, Vijayanagar Works

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顧問	Dechun Tian	President Komatsu Machinery Manufacturing (Shandong) Company Limited
〃	Jayesh Parekh	Director - Quality and Business Excellence, Electrical Standard Products (ESP) Electrical Standard Products Business Unit, Lauritz Knudsen Electrical & Automation – a unit of Schneider Electric India Private Limited
〃	S. Ramadoss	Chief Human Resources Officer(CHRO) Lucas-TVS Limited
〃	Hemant Sikka	President Mahindra Agri Solutions Limited
〃	Rajan Jain	Chief Operating Officer National Engineering industries Limited
〃	Li Caifen	Board Chairman Ocean's King Lighting Science & Technology Company Limited
〃	Jamalludin	President of PT Komatsu Indonesia PT Komatsu Indonesia
〃	G. Ramesh	Associate Vice President Rane Madras Limited
〃	J. Shankar	Deputy General Manager Rane (Madras) Limited Brake Components Division
〃	S. Rajkumar	President Rane (Madras) Limited Engine Component Division
〃	Gulshan Wadhwa	General Manager-Corporate QA and TQM Rane Steering Systems Private Limited
〃	N. Suresh Kumar	Vice President-Corporate Manufacturing Engineering & TQM Zf Rane Automotive India Private Limited (Steering Gear Division)
〃	Jagmohan Singh Sekhon	Executive Advisor Reliance Industries Limited
〃	M Sankara Narayanan	Executive Director(Operations) RSB Transmissions(I) Limited
〃	Aslam Bin Abdullah	Management Representative Sanden International Singapore Private Limited
〃	Ryuhei Ushikubo	Joint Managing Director Sanden Vikas India Private Limited
〃	Poramate Chairat	Corporate BCM & IBE Director Siam Cement Public Company Limited
〃	Neeraj Chandna	Head - TQM SRF Limited, Chemicals Business
〃	B Parthipan	Senior General Manager, Manufacturing Systems & Corporate TQM Sundram Fasteners Limted
〃	Ravinder Guleria	Chief Finance Officer TaTa AutoComp Hendrickson Suspensions Private Limited
〃	Niteen Naik	Business Unit Head Tata AutoComp Systems Limited - Composites Division
〃	Kunal Pareek	Head (Business Excellence & Total Quality Management), T&D Cluster, Tata Power Company TaTa Power Delhi Distribution Limited
〃	Tripti Srivastava	Chief Total Quality Management (TQM) and Corporate Quality Assurance (CQA) Tata Steel Limited
〃	Shesh Gupta	Unit Head Thai Acrylic Fibre Company Limited
〃	Gary Chen	Chief Quality Officer Unimicron Technology Corporation
〃	Ravindran Devarajan	Head - Plant Engineering Vayona Energy Private Limited

（42 名）

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顧問（学識経験者等，氏名五十音順）

顧問	大久保　尚　武	積水化学工業 社友
〃	狩　野　紀　昭	東京理科大学名誉教授
〃	久　米　　均	東京大学名誉教授
〃	司　馬　正　次	筑波大学名誉教授
〃	細　谷　克　也	有限会社品質管理総合研究所 代表取締役 所長
〃	鷲　尾　泰　俊	慶應義塾大学名誉教授

（6 名）

運営委員会委員（順不同）

委員長	佐々木　眞　一	一般財団法人日本科学技術連盟　顧問
副委員長	小　笠　原　　浩	一般財団法人日本科学技術連盟　理事長
委員	中　尾　　眞	株式会社ジーシー　最高顧問
	飯　塚　悦　功	デミング賞本賞選考委員会委員長，東京大学名誉教授
	小　原　好　一	前田建設工業株式会社　顧問
	永　田　　靖	デミング賞審査委員会委員長，早稲田大学名誉教授
	棟　近　雅　彦	デミング賞審査委員会副委員長，早稲田大学　教授
	森　田　　浩	デミング賞審査委員会副委員長，大阪大学 特任教授・名誉教授
	山　田　　秀	デミング賞審査委員会副委員長，日経品質管理文献賞選考委員会委員長，慶應義塾大学 教授
	島　田　尚　徳	デミング賞委員会セクレタリー，一般財団法人日本科学技術連盟　理事

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⑵ 各委員会の編成分担（敬称略，各委員会委員長の役割は2026年11月１日現在）

デミング賞委員会の活動は，次の各委員会を編成して行いました．

① 運営委員会

委 員 長　一般財団法人日本科学技術連盟　顧問　佐々木　眞一

委　　員　８名

② デミング賞本賞選考委員会

委 員 長　東京大学名誉教授　飯塚　悦功

委　　員　15名

③ デミング賞審査委員会

委 員 長　早稲田大学名誉教授　永田　靖

委　　員　40名

④ 日経品質管理文献賞選考委員会

委 員 長　慶應義塾大学　教授　山田　秀

委　　員　42名

２．委員会の活動

⑴ 2026年１月20日に第１回デミング賞委員会を開催し，次の事項を決定いたしました．

① 委員，顧問の委嘱

② 2025年度収支決算

③ 2026年度予算

④ 各委員会委員長と委員の編成

⑤ 2026年度デミング賞委員会行事について

⑵ 2026年３月７日に第１回デミング賞審査委員会を開催し，本年度の実行計画，デミング賞の審査方法などについて検討し，本年応募組織の認定を行いました．これに則り実地調査のスケジュールと担当委員の分担を決定し，５月に海外審査に対して行われる書類審査を実施しました．

⑶ 2026年６月６日に書類審査合否判定会を開催し，海外応募組織に対して行われる書類審査の合否を決定いたしました．これに則り８月８日から９月５日の間に応募組織の実地調査を行いました．

⑷ 2023年デミング賞受賞２組織に対して，受賞３年後のフォローアップのための調査をオンラインも含めた形で実施することを決定いたしました．

⑸ 2026年９月26日にデミング賞本賞選考委員会，2026年10月３日に第２回デミング賞審査委員会，日経品質管理文献賞選考委員会をそれぞれ開催し，本年度の各賞の受賞候補者について審議し，受賞候補者の選定を行いました．

⑹ 2026年10月６日に第２回デミング賞委員会を開催し，各委員会からの報告に基づいて審議の結果，本年度の各賞受賞者を決定いたしました．

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3．授賞行事

2026年10月６日の委員会における決定に基づき，下記のとおり授賞行事を行うことにいたしました.

⑴　デミング賞授賞式および受賞祝賀会

2026年11月11日　13：00 ～ 16：00　デミング賞受賞報告講演会
16：15 ～ 17：00　日本品質奨励賞授賞式
17：15 ～ 18：05　デミング賞授賞式
会場：経団連会館 ２階経団連ホール
18：20 ～ 19：20　受賞記念合同祝賀会
会場：経団連会館 ４階ダイアモンドルーム

4．これまでの受賞者（組織）数

1951年デミング賞創設以来，本年までの各賞受賞者（組織）数は次のとおりです.

デミング賞大賞　延べ33組織（再度の受賞組織２組織，海外12組織を含む）
デミング賞本賞　89名
デミング賞普及・推進功労賞（海外）　５名
デミング賞特別功労・実践賞　６名
デミング賞　延べ275組織（うち海外71組織）
⑷デミング賞　52組織（うち海外33組織）
2012年度の賞の名称変更以降の数※※※
⑸デミング賞実施賞中小企業賞（1994年まで）
38組織※
⑹デミング賞実施賞事業部賞（1994年まで）
５社５事業部※
⑺デミング賞事業所表彰（2009年まで）
16社20事業所（うち海外３社３事業所）※※
⑻デミング賞実施賞（2012年まで）
延160組織（うち海外35組織）※※※
日経品質管理文献賞　265件

※1995年度からデミング賞実施賞中小企業賞および実施賞事業部賞という名称は廃止され，デミング賞実施賞に一本化されました.
※※2010年度からデミング賞事業所表彰はデミング賞実施賞に一本化されました.
※※※2012年度から「日本品質管理賞」は「デミング賞大賞」に，「デミング賞実施賞」は「デミング賞」に名称変更しました.

以　上

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発行　デミング賞委員会
一般財団法人 日本科学技術連盟

〒163-0704　東京都新宿区西新宿２－７－１
新宿第一生命ビルディング４階
（一般財団法人日本科学技術連盟内）
TEL 03－5990－5852
URL：https://www.juse.or.jp/deming/

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