This chapter focuses on the basic information about the quality perspectives collected by researcher from his visits to the sample companies and in-depth interviews with the senior officials at these companies. Besides, this, internal manuals and bulletins were collected, respective websites were browsed and newspapers, journals and magazines were referred.

Plant visits were undertaken to observe:-

I. The organization for quality assurance;
II. Quality assurance tools and techniques used;
III. Quality improvement activities being undertaken;
IV. Management of in-process materials; and
V. Maintenance of manufacturing processes and facilities.

Plant visits also encompassed unstructured in-depth interviews with senior professionals’ in-charge of quality assurance and quality management in the respective organizations. Some ‘mini-groups’ or focus interviews have also been concluded with junior level quality assurance executives at the shop floor level to validate the information collected from in-depth interviews with top level officials. Questionnaires were simultaneously administrated to the respondents.

Most of the plant-visits have been preplanned and aided by top management, usually in charge of quality assurance and quality management. At least three plant visits were undertaken in each company to make practical observations.

The observations regarding TQM in the sample companies vide plant visits and in-depth interviews with employees, have been reported as follows:

1. TQM at Maruti Udyog Limited

TQM at MUL is thoroughly furnished as manifested through the existence of exclusive Quality System Department. The guidelines on total quality management are prepared by this department. According to senior official at MUL, TQM is evolution of the concept of quality and it has evolved over various stages viz. Inspection, Statistical Quality Control, Quality Assurance, and Total Quality Control or Management. The evolution, as perceived at MUL, is indicated in the table below:

Table 5: Evolution of TQM at MUL

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Inspection</th>
<th>SQC</th>
<th>Quality Assurance</th>
<th>Total management</th>
<th>Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary concern emphasis</td>
<td>Detection of bad parts</td>
<td>Control on production process to produce quality</td>
<td>To assure quality in production</td>
<td>Strategic impact of quality on company's performance in the market. Quality as a strategic / competitive issue</td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>------------------------</td>
<td>-----------------------------------------------</td>
<td>-------------------------------</td>
<td>---------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Quality?</td>
<td>Meeting specifications</td>
<td>Meeting specifications through control on process</td>
<td>Building Product quality from design to production</td>
<td>Meeting customer requirements / expectations better than the competitor</td>
<td></td>
</tr>
<tr>
<td>Who has responsibility of quality</td>
<td>Inspection department</td>
<td>Manufacturing and quality departments</td>
<td>Departments like Design, production, Quality. Top Management involvement is minimal in quality.</td>
<td>Everyone in the organisation with top management exercising strong leadership</td>
<td></td>
</tr>
<tr>
<td>Orientation &amp; Approach</td>
<td>'Inspects in' quality</td>
<td>'Controls in' quality</td>
<td>'Builds in' quality</td>
<td>'Manages in' quality</td>
<td></td>
</tr>
</tbody>
</table>

1.1 The Philosophy

The philosophy of TQM, as defined at MUL, is “Management approach of an organisation, centered on quality, based on the participation of all its members and aiming at long term success through customer satisfaction and benefits to all members of the organisation and to society.

Thus, the key elements of this philosophy are:

**Management Approach:** TQM is a way of managing business.

**Centered on Quality:** Quality is the focus of this approach. Meaning of Quality, however, is not restricted to 'meeting the specifications'. It has a much broader meaning and includes:

- Anticipating and Meeting customers’ requirements and expectations (stated and implied) in terms of product quality, reliability, price, product features, service etc;
- Quality (Excellence) in all activities of the organisation;
- Better than the competitor. It is the strategic issue for the top management to maintain / improve competitive position of the company; and
• Continuous improvement in performance in all areas to improve the competitiveness of the organisation.

**Participation of all its Members:** Everyone in the organisation, from top to bottom and covering all functions is to be involved in quality. Quality is not the responsibility of Quality Function only, but of the entire organisation.

**Members** include the vendors, dealers etc

**Aiming at Long Term Success:** not at short term quick results

**Customer Satisfaction and Benefits to all Members of the Organisation and to Society:** long term success and growth of the organisation can be sustained only if the company balances the requirements of and takes care of all its stake holders’ i.e.

• Customers
• Employees
• Suppliers / dealers etc
• Society at large

1.2 The Tools and Techniques of QC

The guiding philosophy is backed by the following tools and techniques of Quality Control at Maruti Udyog Limited:

• Strategic Quality Planning: for detailed planning in the company oriented towards meeting company’s vision, mission and objectives;
• Quality Function Deployment: for bringing in those products in the markets which meet the requirements of the customers, putting in place those controls which ensure the meeting of customer requirements;
• PDCA (Plan Do Check Act) Cycle: the company is using this cycle in all areas for promoting continuous improvements;
• Use of Statistical techniques- like Shewhart Charts, Acceptance Sampling, OC Curves, AOQL etc. for reducing variation in all processes for improved customer satisfaction and reducing costs;
• Managing / Improving the Business Processes;
• Benchmarking for learning from others, achieving breakthrough improvements; and
• Use of 5-S: Seiri, Seiton, Seiso, Seiketsu, Shitsuke.

The Focus of implementing TQM at Maruti Udyog Limited remained on:
• Leadership for Quality;
• Customer- A near obsession with satisfying the customer;
• Employees- Involving and tapping the full potential of all employees towards a common company goal and towards continuous improvement. The tools like Suggestion Scheme, QC, Teams for Quality improvement have been put in place;
• Fact and data based scientific management with tools / techniques such as PDCA, SPC, QFD, Strategic Planning etc; and
• Continuous Improvement- managing business processes more efficiently.

MUL has recognized following CII model for Total Quality Management at strategic Quality management level for its reference:

Figure 8: CII model for TQM

![CII model for TQM](image)

This model is based on the premise that; 'Customer satisfaction', ‘People Satisfaction’ and ‘Impact on Society’ are achieved through Leadership, driving ‘Policy & Strategy’, ‘People Management’, ‘Resources’ and ‘Processes’, leading ultimately to ‘Business Excellence’.

The model comprises of nine criteria as indicated in the figure 8. Five criteria namely Leadership, Policy & Strategy, People Management, Resources & Processes are termed as
'Enablers', while the rest four People Satisfaction, Customer Satisfaction, Impact on Society and Business Results are referred as 'Results'. 'Enablers' are the criteria under which one takes initiatives / approaches / actions to achieve the desired ‘results’ in respect of Employees, Customers, Society and Business.

MUL believes that sustainable business results can only be achieved if the company is achieving results in relation to employees, customers and the society at large the stakeholders of the company. The Leadership of the company drives policy & strategy, people management and resources (financial, equipment, suppliers, and information). All these are routed through business processes to achieve the results, where the process is a sequence of steps / activities that adds value by producing the required output from a variety of inputs.

For this Model to be in vide use PDCA cycle, the company has to

- set targets for itself under the 'Results' side;
- take appropriate initiatives / actions under 'Enablers';
- check for the outcome under 'Results'; and
- review and improve the approach / initiatives / actions under 'Enablers' to achieve the desired results.

During the assessment for the award and scoring, the assessors look for this linkage between the 'Enablers' and 'Results' -

- 'Results are caused by approach' this is checked while evaluating the 'results'; and
- 'Approach is reviewed for improved business effectiveness'-this is checked while evaluating the 'enablers'.

For Self Assessment and for certification Awards, the scoring is done with allocated weightages to each element as indicated in the Fig 4.1. It is noted that cumulative weightage for 'enablers' is 50% and so is for 'results'.

Formalized documentation has been done for assessing Enabler and Results, as depicted in Table 6 and 7 respectively.

**Table 6: Assessing Enablers**
<table>
<thead>
<tr>
<th>Approach</th>
<th>Score</th>
<th>Deployment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anecdotal or non value adding</td>
<td>0%</td>
<td>Little effective usage</td>
</tr>
<tr>
<td>Some evidence of soundly based approaches and prevention based systems. Subject to occasional review. Some areas of integration into normal operations</td>
<td>25%</td>
<td>Applied to about one quarter of the potential when considering all relevant areas and activities</td>
</tr>
<tr>
<td>Evidence of soundly based systematic approaches and prevention based systems. Subject to regular review with respect to business effectiveness. Integration into normal operations and planning well established</td>
<td>50%</td>
<td>Applied to about half the potential when considering all relevant areas and activities</td>
</tr>
<tr>
<td>Clear evidence of soundly based systematic approaches and prevention based systems. Clear evidence of refinement and improved business effectiveness through review cycles. Good integration of approach into normal operations and planning</td>
<td>75%</td>
<td>Applied to about three quarters of the potential when considering relevant areas and activities</td>
</tr>
<tr>
<td>Clear evidence of soundly based systematic approaches and prevention based systems. Clear evidence of refinement and improved business effectiveness through review cycles. Approach has become totally integrated into normal working patterns. Could be used as a role model for other organisation</td>
<td>100%</td>
<td>Applied to full potential in all relevant areas and activities</td>
</tr>
</tbody>
</table>

**Table 7: Assessing Results**

<table>
<thead>
<tr>
<th>Results</th>
<th>Score</th>
<th>Scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anecdotal</td>
<td>0%</td>
<td>Results address few relevant areas and activities</td>
</tr>
</tbody>
</table>
### Comparison of Results with Targets and Other Organizations

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>25%</td>
<td>Some favorable comparison with own targets. This implies that results are promising but not exhaustive. Results address some relevant areas and activities.</td>
</tr>
<tr>
<td>50%</td>
<td>Many results show strongly positive trends over at least 3 years. Favorable comparisons with own targets in many areas. Some comparisons with external organizations. Some results are caused by approach.</td>
</tr>
<tr>
<td>75%</td>
<td>Most results show strongly positive trends over at least 3 years. Favorable comparisons with own targets in most areas. Favorable comparisons with external organizations in many areas. Many results are caused by approach.</td>
</tr>
<tr>
<td>100%</td>
<td>Strongly positive trends in all areas over at least 5 years. Excellent comparisons with own targets and external organization in most areas. 'Best in class' in many areas of activity. Results are clearly caused by approach. Positive indication that leading position will be maintained.</td>
</tr>
</tbody>
</table>

### Total Quality Management at Honda Siel Cars India Limited

Honda takes pride in defining quality as, improving the quality of all aspects of work. Improvement in the quality of work means— “to be able to achieve the targets and objectives
through closely & effectively co-operating with people” and in that, TQM is used to effectively progress the working in totality. Company’s objectives can not be achieved by any one person’s efforts. Just as many processes are required to manufacture a complete car, similarly, efforts of various employees are required to achieve any single target.

With this Honda philosophy as basis, HSCIL initiated the evolution of TQM for the “spirited individual” with aim of achieving “spirited independence” for both Honda associates and organization in India. The fundamental goal of Honda Siel Cars India Limited for every associate is to show its own capabilities, individuality, and passion, so that its individual strength enhances the strength of the entire Honda operation in India. Adopting this approach, HSCIL assesses the operational conduct of every entity, reevaluate it, and evolve TQM towards the direction of getting the job done by thinking their own ideas and taking initiative. In this way, TQM evolution, at Honda Siel, is an effort to realize the belief - The spirited individual is the source of HSCIL competitiveness.

To effectively and efficiently achieve the objectives of TQM Promotion Office HSCIL strives to institutionalize TQM at every step. The main aim of this is to equip everyone in the department for making them capable of rotating the CAP-Do cycle of Self-Controlled Daily Management, besides managing rotation of DST-PDCA Cycle of their initiatives-based Policy Management.

HSCIL has been outgoing the pace of growth of the market and this became possible basically because of efforts of all associates towards improvement in QCD levels. However, sudden changes in the environment bring challenges to the company like shortage of skilled manpower, satisfactory work performance etc. Therefore, HSCIL started Total Quality Management training since 2004. To achieve the objectives of the company, which are targets for various departments are further divided into smaller targets.

The company realizes that TQM as a process is more important that the result. An individual puts efforts to his best extent and decides the methods to be applied. His results and success become the result and success of the company finally.

The fundamental belief at HSCIL is ‘respect for the individual’, which encourages them to act and work on their own initiatives, having their own ideas and thinking. The guiding key elements, in the management philosophy as noted by researcher during his visits at HSCIL, were:

- Proceed always with ambition and youthfulness;
- Respect sound theory, develop fresh ideas and make the most effective use of time;
- Enjoy your work, and encourage open communications;
- Strive constantly for a harmonious flow of work; and
- Be ever mindful of the values of research and endeavor.

These policies encourage the employees to challenge every person’s own dreams and also spread a message among the employees not to be satisfied with the present condition, rather to try hard in *quest for improvement*. The principle behind these policies of HSCIL is *maintaining a global viewpoint by supplying products of the highest quality at reasonable price for worldwide customer satisfaction*. The company recognizes worldwide customer satisfaction as the one exerting utmost efforts to comply with the demand from each customer and delivering better satisfaction than expected.

The key concepts of TQM Philosophy at HSCIL have been mentioned in the table 8:

**Table 8: Key Concepts of TQM Philosophy at HSCIL**

<table>
<thead>
<tr>
<th>Keywords</th>
<th>Key Concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiative</td>
<td>1) Think Creatively&lt;br&gt;2) Act on own initiative and judgment&lt;br&gt;3) Take responsibility for the results of actions</td>
</tr>
<tr>
<td>Equality</td>
<td>1) Recognize and respect individual differences&lt;br&gt;2) Treat one another fairly&lt;br&gt;3) Create equal opportunity</td>
</tr>
<tr>
<td>Trust</td>
<td>1) Base international relationship on mutual trust&lt;br&gt;2) Provide help to others and accept help ourselves&lt;br&gt;3) Make sincere effort to fulfill our responsibilities</td>
</tr>
<tr>
<td>The joy of buying</td>
<td>1) Build customer understanding for the product&lt;br&gt;2) Gain customer acceptance for the product&lt;br&gt;3) Attain customer satisfaction with the product&lt;br&gt;4) Experience the joy of buying products and services</td>
</tr>
<tr>
<td>The joy of selling</td>
<td>1) Enhance the human relationship with our dealers and customers&lt;br&gt;2) Provide products and services which exceed customer expectations&lt;br&gt;3) Experience pride in representing Honda Products and services</td>
</tr>
<tr>
<td>The joy of creating</td>
<td>1) Design, develop, engineer and manufacture product that</td>
</tr>
</tbody>
</table>
| Maintaining a global viewpoint | 1) Awareness that Honda products are sold throughout the world  
2) Seek the Number One position in customer satisfaction  
3) Re-examine the quality and standard of our own work broadly  
4) Challenges to solve global scale problems such as environment and resources. |
|---|---|
| We are dedicated | 1) Work together for a common purpose  
2) Imply a sense of trust between associates  
3) Recognize the importance of doing something |
| To supplying products of the highest quality yet at reasonable price | 1) Strive for technological leadership in products and systems  
2) The product give value for the money  
3) Set a reasonable price matching the products of the highest quality. |
| Worldwide customer satisfaction | 1) Do our best to exceed customer expectations  
2) Be ahead of the times  
3) Have a ‘highly sensitive antenna’ for customer desires and needs  
4) |
| Proceed always with ambition and youthfulness | 1) Be a company with a dream  
2) Seek the challenge and do not fear failure  
3) Be committed to ideas |
| Respect sound theory, develop fresh ideas, and make the most effective use of time | 1) Confirm the soundness of the theory  
2) Be flexible to accept fresh ideas  
3) Our approach:  
   Simplicity- grasping the essence  
   Concentration- focusing resources and thinking  
   Speed- rapid implementation  
4) Be ready on time |
| Enjoy your work, and encourage open communications | 1) Take pride in work  
2) Feel a sense of accomplishment  
3) Support the efforts of associates  
4) Foster teamwork and togetherness  
5) Promote Two-way communications |
| Strive constantly for a harmonious flow of work | 1) Maintain a natural and consistent flow of work  
2) Understand our outside and inside customers  
3) Promote an efficient and effective operations |
Be ever mindful of the value of research and endeavour

| 1) Encourage creative dissatisfaction |
| 2) Carry out the ‘Three Reality Principle’ |
| *Go to the actual place |
| *Know the actual situation |
| *Be realistic |
| 3) Always make efforts for improving |

HSCIL encourages employees to carry out their work based on the customers’ point of view, as depicted in the figure below:

**Figure 9: Down Stream and Upstream Process**

1) Listen to customers
- What Customers want?
- What people in the upstream and downstream process need?

2) Set objectives
- Gain an accurate understanding of what customers want

3) Raise the customer satisfaction index
- Review what has been taken for granted both generally and by yourself

Two way communications is recognized as key ingredient in the TQM policy at HSCIL and the purpose behind this is to constantly maintain two-way communication on evaluation of performance. The two way communication concept at HSCIL is as follows:

**Figure 10: Two Way Communication Diagram**
The DST-PDCA Cycle is the backbone of TQM philosophy at the company. The format is to proceed with work by picturing ideal states, such as 'want to do this, want to be like this' etc. and continue till the realization of improvement and standardization.

Figure 11: Draw, See, and Think- PDCA Cycle

<table>
<thead>
<tr>
<th>Theme finding/setting</th>
<th>Draw</th>
<th>See</th>
<th>Think</th>
</tr>
</thead>
<tbody>
<tr>
<td>Draw</td>
<td>Picture one's Ideal State</td>
<td>Recognize Reality</td>
<td>Consider themes</td>
</tr>
<tr>
<td>[ Want to do this ] Want to be like this</td>
<td>Analyze current situation</td>
<td>Grasp the facts</td>
<td>Draw out themes of what should do</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Plan</th>
<th>Do</th>
<th>Check</th>
<th>Act</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make action plan</td>
<td>Put plans into action</td>
<td>Check by actual Results</td>
<td>Take responsive countermeasures</td>
</tr>
<tr>
<td>Plan &amp; standards</td>
<td>Training &amp; Implementation</td>
<td>Analysis &amp; learning</td>
<td>Improvement &amp; standardization</td>
</tr>
</tbody>
</table>

Two-way communication

What subordinates want to know
- What is expected of them;
- Evaluation of their performance and transparent feedback;
- Future jobs, etc.

What subordinates want to tell:
- Achievements, opinions, ideas about work;
- Problems with work or the Workplace;
- Hopes for the future, etc.

What managers should tell:
- Roles of department;
- Roles of individual, and expectations;
- Performance appraisal and follow-up guidance;
- Next stage of work, etc.

What managers should know:
- Opinions and ideas about Work;
- Problems with work, the workplace, etc., and what guidance is needed;
- Hopes for the future, etc.

Two-way communication
The QC tools that are in use, over the years are as depicted in the table 4.5:

**Table 9: QC Tools at HSCIL**

<table>
<thead>
<tr>
<th>No.</th>
<th>QC Tool</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pareto Diagram</td>
<td>Singling out the really serious problems from among all the lesser ones</td>
</tr>
<tr>
<td>2</td>
<td>Cause-and-effect Diagram</td>
<td>Picking up and arranging all possible causes without any omissions.</td>
</tr>
<tr>
<td>3</td>
<td>Graphs and charts</td>
<td>Making data visual.</td>
</tr>
<tr>
<td>4</td>
<td>Check sheets</td>
<td>Simplifying data collection and ensuring that no items are omitted when inspecting.</td>
</tr>
<tr>
<td>5</td>
<td>Histograms</td>
<td>Plotting the shape of a distribution and comparing it with specifications.</td>
</tr>
<tr>
<td>6</td>
<td>Scatter diagrams</td>
<td>Finding correlation between paired sets of data.</td>
</tr>
<tr>
<td>7</td>
<td>Control charts</td>
<td>Checking whether or not a process is in control.</td>
</tr>
</tbody>
</table>

In addition, following tools are also being introduced in the company:

**Table 10: New QC Tools**

<table>
<thead>
<tr>
<th>No</th>
<th>Method</th>
<th>Main Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Relations diagram</td>
<td>Elucidating complex problems by identifying logical connections.</td>
</tr>
<tr>
<td>2</td>
<td>Systematic Diagram</td>
<td>Systematically searching for the most effective means of accomplishing given objectives.</td>
</tr>
<tr>
<td>3</td>
<td>Matrix diagrams</td>
<td>Clarifying problems through multidimensional thinking.</td>
</tr>
<tr>
<td>4</td>
<td>Affinity diagrams</td>
<td>Unearthing by organizing data on chaotic situations.</td>
</tr>
<tr>
<td>5</td>
<td>Arrow diagrams</td>
<td>Controlling schedules by expressing relationships among tasks in the form of a network.</td>
</tr>
</tbody>
</table>
3. **Total Quality Management at General Motors India**

General Motors India has separate launch team for smooth launching of cars and addressing manufacturing related issues of new projects. The assembling of cars is done on different lines depending on the features of the car to resolve product specific issues. Researcher observed that culture has been around GMS principles *right first time, continual improvement & sense of urgency* among employees. Senior officials at GMI claimed to have proactive approach to problem resolution through the development of PFMEA, PTR process etc. External and internal quality issues are resolved through active participation of various teams involved in the generation of the product for customer satisfaction. People development is considered to be most important activity at GMI which includes utilization of employees’ creativity, right mix of skill set /competence, adequate backup to ensure minimal drop in efficiency and quality of work in case of employee turn-over, besides APO assignments that helps in motivation as well as improvement in skills set.

The researcher also observed that PDCA cycle is an important part of quality activities. Head Quality, at the company, ensures the proper rotation of PDCA cycle by assigning different duties to different departments and action is duly undertaken to gather the feedback from customers.

**Figure 12: Quality Improvement Feedback Loop**
The Quality Planning & In-process Department is responsible for the planning of improvements in the existing products and designing new products. New Product Launch & Quality Operations department does the Do part, while Quality Engineering, Audits & Field Liaison department is responsible for Checking the actions taken by Quality Operations department. The quality improvement feedback loop at GMI is depicted in figure 13.

The Quality Planning & In-process department plans new products or changes in existing products by utilizing following tools/techniques:

- Field Data – Warranty, Campaign
- In-process audits
- Station audits
- Destructive testing and paint durability
- Production trial run
- Profit council & cost saving activities
- Staff training etc.

Following are the activities under the domain of New Product Launch & Quality Operations Department:
- Standardized Inspection Process (Body, Paint, Trim Chassis & Test Line)
- Measuring quality performance and feedback collection
- Quality feedback is forwarded to production
- Operator Certification & Audits
- Online and offline repair confirmation
- Inputs for problem solving
- Pre-dispatch Inspection at finished goods yard
- Business Plan Deployment (BPD) Board Management
- Improvement in factory supplies
- Suggestion Scheme, Kaizen, Quality Circle
- ISO MR activities etc

At Quality Engineering, Audits & Field Liaison department of GMI, following form the functional set:
- Finished Vehicle Audit & provision of feedback (GCA & SPA)
- Coordination of plant’s problem resolution activities
- Developing and maintaining standards
- Compliance to monitoring audit requirements
- Inspection of ageing cars (90 days)
- Warranty failed parts analysis & feedback
- Field problem diagnosis & tracking
- Coordination with GMDAT for J200/ T200/ T250 field problem resolution
- Drive JD Power improvement initiatives
- Customer survey analysis
- Liaison with Dealers, Marketing, After sales, Customers etc

Figure 13 explains the Issue Resolution Process practiced at GMI.
4. Observations at Tata Motors

TATA Motors is committed to maximizing customer satisfaction and strives to achieve the goal of excellence by continuous improvement through ongoing design and development manufacture and sale of reliable, safe, cost-effective, quality products and services of international standards, by using environmentally sustainable technologies for improving levels of efficiency and productivity with in its plants and ancillaries. TATA Motors also have a commitment towards improving the quality of life of its employees, both with in and outside its plants and offices, through improved work practices and social welfare schemes. With a vision to evolve into a world class Indian car brand TATA Motors has a mission to provide passenger cars that offer customers exceptional value, and through this build a company that provides its shareholders with superior returns, and is seen by society and other stake holders as a valuable contributor to their development.

TATA Motors uses scientific approach and methodology for problem solving which emphasizes individuals to observe and connect the world of mentality and reality with understandable explanation of related facts. The top priority of employees in this company is to be well informed
about the reality of the target and the point is to achieve the goal, not the complexity or detail of the applied method. The management technologies viz. TPM and TPS, which Japan takes pride in, are extensively used in this company. TATA Motors uses 5-S: Seiri, Seiton, Seiso, Seiketsu, Shitsuke. Use of seven QC tools - Pareto diagrams, Fishbone diagrams, Control charts/ graphs, Check-sheets, Scatter diagrams, Histograms, and Stratification - for problem solving, task achieving, situation analysis etc was observed by the researcher during his visit at Passenger Cars Business Unit, TATA Motors.

Improvement procedure and QC methods in problem solving as observed by researcher at PCBU, TATA Motors are depicted in table 4.7.

<table>
<thead>
<tr>
<th>Step</th>
<th>Frequently used QC method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theme setting</td>
<td>Cause and effect diagram, Pareto diagram, Relations diagram(multi purpose type), Matrix diagram</td>
</tr>
<tr>
<td>Target setting</td>
<td>Pareto diagram, Histogram</td>
</tr>
<tr>
<td>Promotion program planning</td>
<td>Gantt chart, PDPC, Arrow diagram</td>
</tr>
<tr>
<td>Grasp, analyze the present</td>
<td>All QC method</td>
</tr>
<tr>
<td>Countermeasure planning</td>
<td>Relations diagram(objective-method type), Tree diagram</td>
</tr>
<tr>
<td>Implementation</td>
<td></td>
</tr>
<tr>
<td>Confirm the effect</td>
<td>Pareto diagram, Histogram, Binomial probability paper Control chart, Test, Experimental design</td>
</tr>
<tr>
<td>Break of an effect</td>
<td>Relations diagram, Tree diagram</td>
</tr>
<tr>
<td>Review and future plan</td>
<td>Relations diagram</td>
</tr>
</tbody>
</table>

Complete employee participation is encouraged for various activities in this company. It is the firm belief of the company that, a problem arises only when difficulty level exceeds the assurance level, so the emphasis in this company remains at lowering the difficulty level thereby raising the assurance level.
Cross-Functional Management - The management activity that is practiced in cooperation with all members comprising the organisation - across divisions, departments and sections cross functionally: working on each fundamental management factor such as quality, cost, safety: with the goal of common purpose and view so as to achieve it effectively) is an integral part of PCBU, TATA motors. Functions that make plans and adjustment from the corporate or long-term point of view, which tends to be lost from sight by individual departments, are maintained through CFM. Creation of interest in individuals for functions that promotes quality assurance, environment management, employee satisfaction, etc. through CFM was also observed.

The Basic causation model for effective problem-solving used at PCBU, TATA motors is as presented in the figure below:

**Figure 14: Basic causation Model**
In the company, vertical and horizontal managements are followed as a part of Static management, and policy management as a part of dynamic management. Static management includes daily management of systems, activities to accomplish objectives of operating effectively. Management cycles of Policy and Daily management are presented in the figure below.

**Figure 15: Management cycle of SDCA and PDCA**

Senior officials of the company claimed the use of poka yoke (fool-proof) to remove careless mistakes and its effects. The management policies in this company are established on the basis of management principles, long-term and short-term management plans. In order to achieve these
effectively, activities are practiced in cooperation with the entire organization. In order to control policies at PCBU, TATA Motors uses two perspectives—‘policy deployment’ and ‘management of policy’:

**Policy Deployment**: Prepare an ‘Activity Implementation Plan’ to connect ‘policy’ with ‘concrete action plans’ by deploying to embody President Policy to General Manager Policy and then to Manager Policy.

**Management of Policy**: Manage to achieve the objectives and goals of Policy by rotating PDCA cycle.

Policy = Objectives and Goals + Means

Here policy implies “Where to go”, “What to do” and “How to act”. Objectives and goals are ‘the results expected in the future’, and means are ‘fundamental indicators of action plans to achieve the objectives and goals.

According to senior officials, visualization is very important for the growth of any organization and they always keep their subordinates aware about the importance of the visualization. According to them “broader the visualization higher an organization grows, narrower the visualization deeper an organization falls”. The four levels of visualization at PCBU, TATA Motors is represented in figure 16.

**Figure 16: The 4 Levels of “Visualization”**

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Broader, higher

“Ocularization”
Grasp the situation from a “Birds-eye” view

“Visualization”
Information, facts, numbers required for corporate activities

“Observation” (Look carefully)
Dig down with analysis

“Investigation” (Look in details)
Identify specific problems

Narrower, deeper
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