Chapter 4

MOTOROLA (M) SDN. BHD.

Motorola (M) Sdn. Bhd. established its operations in Malaysia in 1972 on a site of a 13 acres land in Sungei Way Free Trade Zone, Petaling Jaya. The area has expanded ever since to about more than 600,000 square feet. There are currently more than 6000 employees with direct labor making up more than 60% of the population. It is a semiconductor manufacturing company with assembly and test facilities of more than 130 integrated circuit packages. The product portfolio mainly consists of microprocessors, memory chips (FSRAMS & DRAMS) and power devices (regulators and amplifiers). Most of these are supplied to major automotive companies such as Ford and General Motors companies through out the world.

Motorola's vision on being recognized as the finest integrated manufacturing organization in the semiconductor industry of the world is driven by its concept of Six Sigma Quality. Six Sigma Quality simply means to achieve a defect rate of 3.4 parts per million, which virtually means zero defects . It has been used as a direction and a guiding light for all activities and everyone strives to achieve the Six Sigma performance standards. Total Customer Satisfaction is the company's fundamental objective and it is everyone's overriding responsibility. There are six key strategies to further address the TCS philosophy and realize the Vision statement, namely

- Total People Involvement

- Technical Excellence

- Leadership

- Cost Improvement

- Speed of Execution and

- Six Sigma Quality and Services

## The History of Participative Problem Solving (PPS)

In 1980, Motorola committed itself to a changed system of management called the Participative Management. The program was formulated in response to the need for increased productivity which is essential if it was to continue to compete in the market place. The participative management program is designed to make optimum use of the knowledge and skills of employees by involving them in problem solving and decision-making processes. In a participative management program, employees contribute their suggestions for improvements in methods and processes based on their job knowledge . To create a participative environment many company wide programs are established such as Participative Problem Solving Teams (PPS) , the ' I Recommend' and '5S Practices' programs.

The PPS team program was introduced in 1984 to strengthen the participative management process in Motorola. Participation then was voluntary. It was a motivational program to create awareness rather than as a strategy to improve plant performances. Involvement were mainly from the operators. The ratio of teams to the total population of the plant was relatively small. The survival rate of the teams were relatively short. At that time, the projects undertaken focused mainly on administrative

errors, non-standardized process and process defects. Solutions provided were geared towards correcting them, thus most teams only developed procedural solutions. It was apparent that the projects lacked technical solutions and innovative ideas. Teams had a chance to make their presentations during the in-house competitions which were held quarterly in the plant's cafeteria. The teams were treated with high tea and presented with plaques and challenge trophies as motivational rewards. Some selected teams were given the opportunity to participate in the Malaysian QCC Convention, organized by the National Productivity Corporation.

In 1989 Motorola's management began to emphasize on team activities as a plant strategy to improve the overall plant performance focusing on quality performance and cycle time. This was in line with the introduction of the corporate's six sigma and cycle time key initiatives.

**Figure 5: Number of PPS Teams from 1990-1996**

Source: Motorola Employee Development Department

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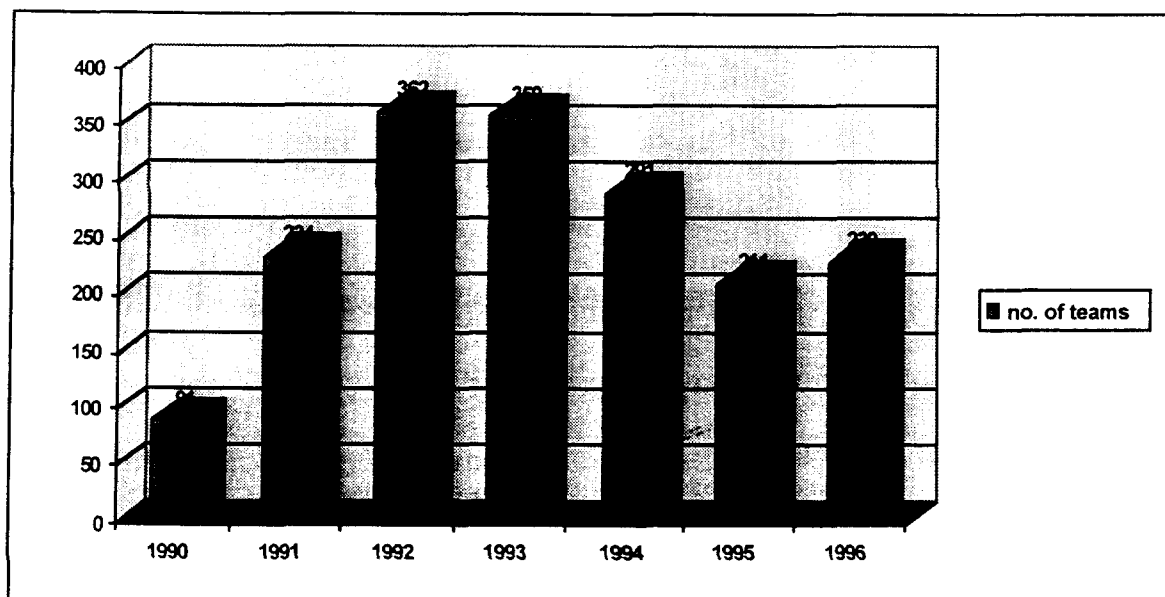
A year later 91 teams were formed and in 1992, there were a total of 362 teams. The number however began to decline 4 years later with an average of about 200 teams each year. The reasons for the decline was due to the abolishment of the old teams and higher expectations from the management on the quality of teams.

PPS Organization

Figure 6 : The Motorola PPS Organization Chart
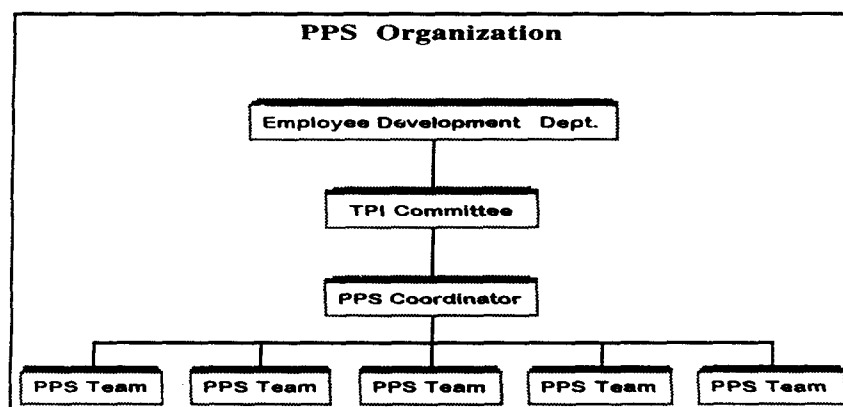
Source: Motorola Employee Development Department

PPS activities are governed by the Employee Development Department, a function of the Human Resource Department (Figure 6). It is responsible for policy making, promotion, administration and control of all PPS activities in the plant. Reporting directly to it, is the TPI (Total People Involvement) Committee. This committee is responsible for ensuring that the PPS are implemented, nurtured and progressing well. It also has the task to study the present and future needs of the PPS and create strategies for the future successes. The PPS coordinators from each department, are responsible for coordinating the activities in a department and ensuring that policies are communicated down and conformed. They are

also the main authority to organize PPS presentations and competitions at the department level. The activities of the PPS teams are closely scrutinized by the coordinators.

The PPS Teams in Motorola are established, to accomplish the following objectives:-

- To foster better human relations among members of the teams

- To continuously improve performances to the optimum level

- To bring out the best in people and to enhance their self esteem

- To make everyone more knowledgeable and well-informed through active involvement

- To make Motorola the best organization in the world

- To provide the best value and services to customers in terms of cost, quality and delivery.

PPS Activities

A support system exists to govern the PPS teams' activities (Figure 7). The flow begins with an interested PPS team submitting a letter of intent to the TPI coordinator. If approved, the team then registers with the Employee Development Department and a project book is issued. At this juncture, teams can choose their own projects. Based on a standard problem solving method, actions are taken and institutionalized. Upon review by the department manager, the team will then be allowed to present the completed project to the department staff. Simultaneously, the TPI coordinator and the Employee Development Department are informed of the completion of the project. The team will

then have a chance to compete in a in-house presentation called the Total Customer Satisfaction Showcase.

Figure 7: Diagram of PPS Support System
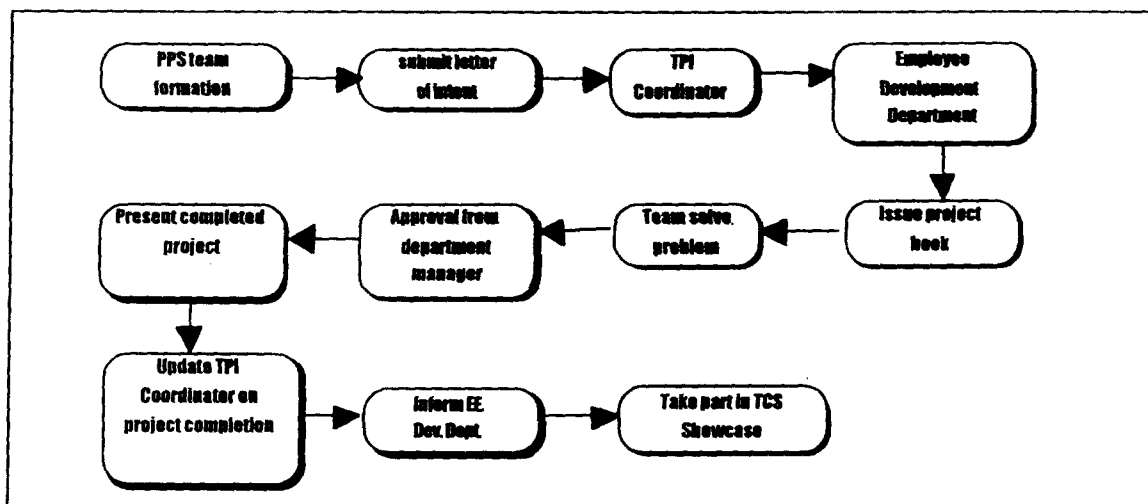
Besides the one hour weekly meeting to resolve the most significant problem at hand, a weekly department review is also held. Each week several teams will be identified to present their activities' status to their respective managers, followed by a weekly presentation at the General Manager's staff meeting. This is where the top management will show their support and provide the timely recognition of the selected PPS team.

The effectiveness and progress of the PPS teams are continuously monitored and measured by having to participate in the quarterly Mini TCS (Total Customer Satisfaction) competition. Teams that have completed their projects will have the opportunity to present them in a mini showcase which is on a departmental basis. A few teams from the same department will compete for a place in the bi-annual TCS semifinals competition. Here, teams from all the departments will compete to qualify for

the annual TCS Finals. At the finals a number of top teams will be identified to represent Motorola KLM at the Motorola Semiconductor Sector Showcase in US. There, various competition among selected teams from the Motorola Semiconductor Product Sector (SPS) from all sites around the world would participate in this grand and much awaited event. The ultimate race of all is the Corporate TCS finals. This is where the finest team in each sector showcase will be honored when they compete with other team from other sectors of Motorola from all parts of the world.

The TCS competition is designed with the following goals

- To have one competition where there is no differentiation of levels or functional categories

- To use universal measurements, where there is consistency of judging with other national conventions

- To ensure that the projects suceed

- To encourage the formation of cross-functional teams to enhance customer responsiveness

Problem Solving Stages

There are 5 main stages that the PPS teams observe while undertaking the assignment of solving a problem. These steps are derived from the famous PDCA cycle used widely in problem solving activities.

Stage 1- Project Selection

At this stage the team is expected to study what is current in the team's operation and to determine which problems to focus on and then, resolved. A concrete and logical target should be established and the selection based on the criterias that correspond to Motorola's strategic mission.

Stage 2 - Problem Analysis

This is a very critical stage whereby the teams would spend more of their time on. All operating procedures and conditions are carefully examined at this very stage. Teams are also required to study all the parameters and observe the possibilities that they have direct or indirect relationship to the problem. The ultimate goal of this stage is to find the root cause of the problem.

Stage 3 - Remedies

Once the root cause has been identified, the next task is to determine the best solution to eliminate the problem. It will be best that at this stage teams attempt to look beyond and find answers that will prevent the recurrence of the problem.

Stage 4 - Results

Implementation of the action plan to resolve the root cause of a problem must be monitored to see its impact in the short and long run. Verification of the impact as well as the ancillary effects of the actions will be performed at this stage. A decision will then be taken on whether there is a need for further modification or adjustment .

Stage 5 - Institutionalization

The project is considered as far from completion if the initial success is not standardized to the entire operation or those processes that are similar in function, within other

departments. Prior to this, the innovations created must be properly documented into standard operating procedures or patented to follow the challenge in procedure requirements. At this stage, teams must continue to track the results, identify solutions, modify the action plan and determine tangible and intangible benefits of the team's effort.

Once the institutionalization is completed, the team is now ready to present its project, starting with a mini competition within the department. Presentation packages are prepared using the in-house computer resources, as most of the members have been trained in application software classes held in the plant. Each department will, then choose the best team and allow them to compete with the other departments' representatives.

The PPS activities in Motorola (M) Sdn. Bhd. have many local and international achievements. As a result of the good reputation achieved from these achievements, Motorola has been benchmarked on how to begin the PPS process and how to ensure the success of the PPS programs. The former General Manager of Motorola, Mr. Roger Betelson, stated that one of the real cornerstones and strength of Motorola KLM over the years has been the philosophy of team building and problem solving. Despite having a good reputation, what is more important is to know how effective is this program in meeting the organizational objectives generally and the employees' need, specifically. This study will attempt to explore the real benefits of such program and evaluate the perceptions of the PPS members on the general process of the PPS activities.