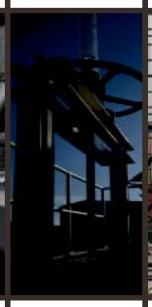
UNIDO - ACMA
Partnership Programme, India

Case Study #1:

Karnatka Automats Pvt. Ltd.




Case Study #1:
Karnatka Automats Pvt. Ltd.

"The UNIDO programme has helped our employees change their mindsets towards learning new concepts. This has greatly contributed to the progress of our organization."

G. Sathya Kumar, Managing Director

OVERVIEW

Company: Karnataka Automats Pvt. Ltd.
Location: Bangalore
Programme period: April 2006 - September 2008 (30 months)
Number of employees: 120 (15% women)
Core products & processes: precision turned components, broaching, gun drilling and milling
Average annual turnover: INR 100 million (USD 2.22 million)

KEY CHALLENGES FACED

- High level of customer complaints on poor quality and tardy deliveries
- Under-utilization of resources (machinery, material and workforce)
- Limited involvement of operators in problem-solving processes
- Limited operating space in the plant

ASPIRATIONS AND AIMS

- Become one of the leading and most preferred suppliers within the supply chain of Bosch To be a safe place for people to work
- Achieve zero defects in its products and zero customer returns/complaints
- Ensure on time deliveries
- Keep manufacturing costs at low levels

BACKGROUND OF KARNATKA AUTOMATS

In 1952 Mr. D.G. Naidu started his own business in a small workshop that was only equipped with a few turning lathes and 34 employees which produced components for a former army base workshop. Four years later, in 1956, Mr. Naidu discovered a new business opportunity and expanded his operations by selling to MICO (a joint-venture later called MICO–BOSCH), a leading fuel-injection equipment manufacturer, which at that time was looking for a supplier of turned components. In 1983, he handed over the management of his company, Karnataka Automats Pvt. Ltd. (KAPL), to his two sons, Mr. G. Sathya Kumar and Mr. G. Raj Kumar. The latter founded a sister company called Karnataka Turned Components Pvt. Ltd., while Mr. Sathya Kumar is currently the present, Managing Director and CEO of KAPL. In 1999, Bosch advised KAPL to be a part of its supply chain by supplying finished components. Earlier, material was supplied by Bosch and the processing (turning) was done by KAPL. From a company doing only processing, KAPL was now a manufacturer and seller of components. Today the company possesses a well-skilled workforce of 120 people engaged in the manufacturing of turned machined parts. In 2001, KAPL initiated some major activities to improve the performance of the company. As a result, the firm obtained an ISO 9002:1994 certification and also upgraded its manufacturing technologies. Finally, in 2004, KAPL also made itself compliant with the TS 16949:2002 standard, an international automotive quality management system certification.

So far KAPL was trying to improve its performance by implementing quality system certification. The company still faced a series of challenges, which turned out difficult to overcome. The customer returns were quite high and defects due to machines were difficult to control. With the increased demand in volume, more space was required for additional machines. Employee morale was relatively low, in spite of training programmes.

At the end of 2005, KAPL received a communiqué from UNIDO and the Indian Auto-Components Manufacturers Association (ACMA), inviting the firm to join their Upgrading Programme and receive technical support in implementing a company-wide process of continuous improvement based on lean manufacturing principles and tools.

VISION STATEMENT

To be a preferred supplier by achieving a zero customer complaint status.

MISSION STATEMENT

Achieve process excellence by incorporating error-free working methods through the help of trained, skilled and alerted work-force.

Case Study #1:
Karnatka Automats Pvt. Ltd.

KAPL'S JOURNEY TROUGH THE PROGRAMME

Introduction of the counsellor to all employees of KAPL

Active participation of employees in Monthly Review Meetings

Improved utilisation of space

Before

After

The programme started in KAPL in April 2006 and lasted for a period of 30 months. At inception, the assigned national expert, Mr. G. Ananthakrishnan, visited the company and met the CEO to understand the major challenges faced by the company – high level of customer dissatisfaction and under utilization of available resources. The next step was to brief the managers and supervisors to involve them in the diagnosis and problem solving process. The counsellor was then introduced by the CEO to all employees of the company in order to initiate open lines of communication between management and workers and to define the company's goals with respect to the programme. The CEO defined the role of the counsellor as a change agent and exhorted workers to contribute to the fullest. Following the initial meetings, the counsellor visited the company three times every two months to review the progress made in identifying the root causes of the problems and to analyse the actions undertaken to solve those problems. The counsellor provided guidance as required and assigned new tasks to the management team in order to facilitate the journey towards fulfilment of defined objectives.

During the first nine months of the programme, the counsellor met all employees in small group settings and emphasized the importance of 5S, systematic data collection, identifying and eliminating waste, safety issues, total employee involvement (TEI). Monthly Review Meetings (MRM) were conducted in the presence of the Counsellor and National Programme Director with emphasis on enhancing the problem-solving ability of workers and to institutionalize the process improvements through the formation of Quality Control Circles (QCC), and teamwork based activities.

IMPROVING RESOURCE AND SPACE UTILIZATION

When KAPL entered the UNIDO-ACMA Programme, space generation was a challenge. Material stocks were lying around on the floor, which resulted in high work in progress (WIP), and increased accident probability. Since KAPL is located in the middle of the metropolitan area of Bangalore, acquiring additional space would have been a costly affair. Therefore, the counsellor saw the urgent need to free additional space on the shop floor to make the production process smoother, ensure the free movement and safety of workers, and gain additional space on the shop-floor to place new equipment. In order to increase the available space, focus was set on reducing scrap generation through Why-Why analysis and Kaizen.

"**Why-Why Analysis**" was introduced by the counsellor as a tool in resolving major problems in this respect. It is a method of questioning that leads to the identification of the root cause(s) of a problem. Questions were raised as to why certain spaces were being utilised in their current form in order to reveal shortcomings and explore possible alternatives. Analysis indicated that clutter and ineffective utilisation of space around machines led to lower productivity and quality issues. In order to alleviate these issues, critical machines were considered as Model Machines under the "**My Machine Campaign**". Operators identified and eliminated abnormalities to improve the overall equipment effectiveness (OEE) of the machines and adjoining spaces.

In addition, **Kaizen** philosophy was introduced to employees to encourage them to come up with suggestions on a regular basis with the objective to incrementally improve productivity, safety and effectiveness while reducing all forms of waste. Following an operators suggestions, a shadow board concept was implemented to easily locate tools without expending effort in locating them.

Case Study #1:
Karnatka Automats Pvt. Ltd.

Classroom training session for KAPL employees

Training provided to eight members who are physically challenged (Partially Blind, Deaf & Dumb), working in shop floor on inspection, press, broaching machine, drilling machine, chamfer machine, consumable stores etc.

ENHANCING EMPLOYEE MOTIVATION

Retention of trained employees was another challenge the company was facing at the beginning of the UNIDO-ACMA Programme. In the period between April 2004 and July 2005, 33 employees left the company, (13 women got married and decided to fully dedicate themselves to their families, while 20 men moved to their native places to follow other professions). Another problem was that the productivity suffered from the lack of clearly defined roles and responsibilities of managers, supervisors and operators, which led to a series of inefficiencies and duplications of efforts. Furthermore, minor cuts on fingers and specs of dust falling in the eyes of the workers occurred once or twice a year before the programme started.

To increase employee involvement in the upgrading cycle, continuous training was imparted and action to **reduce absenteeism rates** was taken. An attendance bonus was offered as an additional incentive. Those employees that were present on all working days in a month were awarded an additional monetary bonus of INR 300 for this respective month. Those employees, who managed to receive monthly attendance bonuses for consecutive 12 months, became eligible for an additional reward of INR 1000 (yearly attendance bonus). Common reasons for leave and absenteeism were identified to be obligations related to payments of the house/apartment, electricity/water bills, and the submission of school fees of the children of the workers. As a response to this finding, the company introduced a scheme that allowed its employees to join duty after addressing these personal obligations and start the 8-hour shift afterwards.

To avoid further accidents, the counsellor assisted in identifying probable causes and carry out **mistake proofing (Poka Yoke).** This is a mechanism that helps avoiding mistakes and eliminating product defects through preventing, correcting, or drawing attention to human errors as they occur. Furthermore, the CEO started to visit the spots where accidents occurred personally and took immediate action.

OTHER INITIATIVES UNDERTAKEN

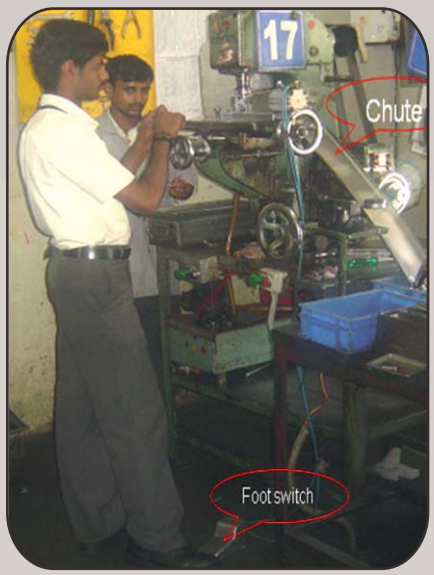
- Establishment of mechanisms to allow more direct interaction between the CEO and employees. This was been done in two ways: Firstly, the CEO addressed all employees once a month where one-to-one interaction was specifically encouraged. Secondly, the CEO personally reviewed the progress in every zone on the shop floor, thereby encouraging interaction with employees as well.
- Organization of family get-together meetings to foster team spirit and communication amongst employees.
- Engaging in employee welfare through charitable activities such as contributing to the school fees of meritorious students of financially week employees was a novel way of owning up employees as family members.
- Provision of advances to employees on specific occasions such as marriages or illnesses as another outcome of TEI activities.
- Introduction of new schemes to encourage employees to pursue higher education and to learn the English language. When the counsellor addressed the CEO or management, he used English as medium of sharing knowledge, but switched over to the local language as soon he addressed workers. Management decided that employees, in batches, would be offered to take tutorial classes for developing spoken English after work.
- Providing training to employees to improve their communication skills and productivity at work.

Case Study #1:
Karnatka Automats Pvt. Ltd.

Kaizen Gallery with workstation related signage

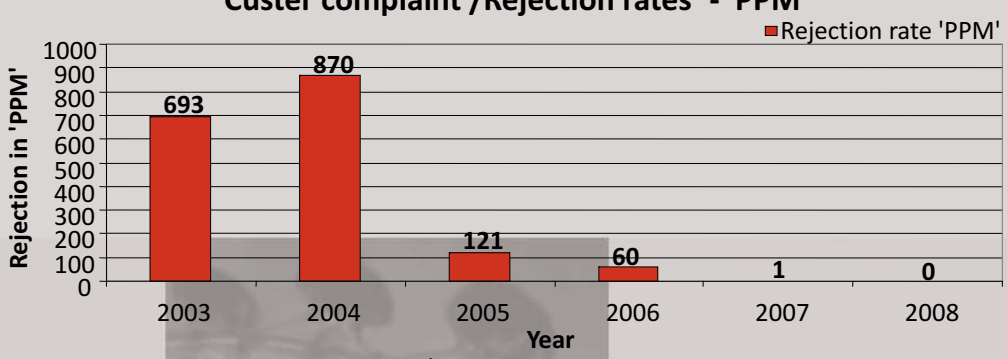
Poka-yoke album

Low cost Automation



DEALING WITH QUALITY CHALLENGES

To reduce customer return (121 repeated complaints in a year) at the start of the programme was a big challenge. More focus was given on mistake proofing. By using 7 QC tools technique and implementing **Poka Yoke**, the customer return became zero. To prevent employees from searching for tools, shadow boards were introduced. The best method to help operators not to commit mistakes is by way of placing signage related to workstations. Quality alert boards and Poka Yoke albums were posted in all stations where critical quality parameters need to be adhered to (fifteen in total) in order to prevent mistakes. These quality alert boards had pictures showing the difference between good and bad parts. The differences were marked on the photograph.



While carrying out improvements of machine/equipment status, there were some important lessons and experiences that need to be captured. For this purpose, 25 "**one-point lessons**" - short visual presentations communicating standards, problems and improvements about work processes and equipment - were displayed at different places on the shop floor, so that previously committed mistakes are not repeated. At the same time, operating procedures (master document) were standardised and displayed in a proper format in 20 important workstations. It took about 3 months for the operators to have all the above-mentioned visual displays in place and followed by employees.

In order to reduce Work in Process (WIP), the counsellor introduced the **SMED (Single Minute Exchange of Dies)** method, which helps to reduce equipment set-up time required for changing production from product to another. If, for instance, one machine produces not only one but several products, the operator usually needs to change some dies, tools and fixtures.

Another tool introduced by the counsellor was **Low Cost Automation (LCA).** It helped to provide ease to operator and reduce process cycle time at a very low cost. In KAPL this was applied in the production process for unloading by gravity as well as clamping and de-clamping through pneumatic applications. A chute was placed near the fixture of the machine, which helped the operator drop the component immediately after removal from the fixture, thus reducing the time between the next loading of component. Furthermore, a bin was placed below the chute where the material got collected. A pneumatic cylinder was operated through foot switch for clamping and de-clamping of components, thereby keeping the operators hands free for loading and unloading only. In addition, the counsellor focused on integrating new components in existing fixtures.

Case Study #1:
Karnatka Automats Pvt. Ltd.

OUTCOMES

CUSTOMER FEEDBACK

"KAPL has many conventional machines which depend on human skills and discipline in following process instructions and systems. To maintain high quality in such an environment is a challenge. Coupled with that is also the problem of attrition which Industries in Bangalore face. KAPL, through their work with the UNIDO-ACMA Programme, brought in a number of employee-involvement measures. This led to increased contributions from individual associates. A number of error proofing solutions, cost reduction ideas came in, apart from the overall improvement in the morale. KAPL is now our Zero PPM supplier and is one of our most trusted partners for the future."

Mr Hariprasad, Bosch
Deputy General Manager, Purchase Quality

Bosch awarded KAPL for best quality, cost and delivery in 2006-2007

KEY RESULTS

Space generation:

- Additional space of 4000 square feet was generated from the scrap yard area.
- Work in Process (WIP) inventory level reduced from 7 to 2 days *in 30 months.*

Enhanced employee motivation:

- Accident frequency of 4 at the start of programme was reduced to zero and severity rate reduced from 240 to zero.
- Absenteeism reduced from 10 to 6.5% in 30 months.

Quality and productivity improvements:

- Measures were taken to improve the overall productivity of the company in order to meet increased customer requirements from 9,000 to 18,000 quantities per day *3 years.*
- Equipment breakdown frequency was reduced from 49 to 18 in one year.
- Changeover time in model line came down from 20 minutes to 7 minutes in second year of the training programme.

The company benefitted on operational as well as commercial grounds. Employees were able to have better bonding with the company. Customer satisfaction level also increased.

SPACE GENERATION

The counsellor asked employees to start disposing material, which had been stored in a scrap yard area for a long time without being used, and to rearrange material required for the production process more systematically, thereby gaining additional operating space.

Reduction in customer returns resulted in space generation as no material was left for re-work. Containerisation helped to reduce inventory as it was easy to find how much material is available on the shop floor, so planning become very easy. Need-based production was done and products were moved to the despatch store.

QUALITY AND PRODUCTIVITY IMPROVEMENTS

KAPL introduced a rapid and efficient way of converting a manufacturing process from running the current product to running the next product. This rapid changeover has turned out crucial for reducing production lot sizes and thereby improving flow. By applying the SMED method, the company managed to reduce its equipment set-up time in model line, which the operator worked on together with the counsellor, from 20 to 7 minutes. The results achieved in the model line were used as training ground for employees to develop other lines in similar fashion even after the closure of programme.

Poke-yoke reached effective implementation with over 30 projects in 16 months, which resulted not only in fewer work related accidents, but also in reaching zero customer complaints.

Around 700 *Kaizens* were effectively implemented and documented. Most of the *Kaizens* were related to production, quality and cost.

Furthermore, KAPL received an "Excellence in Performance" and "0 PPM" award among all the suppliers from its customer, Bosch, in the year 2006.

IMPROVEMENTS			
	Before	**After**	**Change (%)**
Scrap yard area (sq. feet)	4120	12	**+ 99**
WIP (days)	7	2	**+71**
Absenteeism (in %)	10	6.5	**+35**
Training days / employee per year	8	33	**+313**
Accident severity ratio	240	0	**+100**
OEE	60	75	**+25**
Customer returns PPM (average p.a.)	121	0	**+100**
Defects due to machine breakdowns (numbers/year)	350	42	**+88**
New customers added			**0**
New products added			**142**
Tangible savings in operating costs (Money spent vs. return)(US$)			**48000**

Note: Positive trend mark will be '+ 'and negative trend mark will be '-'.

Case Study #1:
Karnatka Automats Pvt. Ltd.

FUTURE OUTLOOK

Front entrance of Kulkarni Engineers

THE SUSTAINABILITY CHALLENGE

After the completion of the programme in a span of 30 months, the CEOs of the participating companies that were attended by the same counsellor met as part of a sustenance phase and decided to continue practicing all activities they learnt during the UNIDO-ACMA Programme. Representatives of the respective companies now meet every month to review the practice and look for opportunities for improvement.

A “Champion” was selected for each key theme, including Kaizen, waste reduction, safety and 5S. The appointed champions were then assigned the responsibility of sustaining the progress already achieved during the cluster programme covering the various blocks of the road map. They are also in charge of training others so that the momentum of the company is sustained. Sustaining achieved results in the productivity domain, keeping employee motivation high and maintaining zero accidents can only be achieved if the learning cycle never stops and if best practices are followed on a continuous basis.

This programme has taught KAPL a systematic approach towards problem solving, method analysis and how to adopt best practices to compete in global markets.

FUTURE TARGETS

- Improvement in the skills matrix of employees until May 2010, by increasing training hours from 33 to 48 per employee per year
- To add at least two new customers by 2015.
- To reduce in-house PPM from 4,000 to 1,000 by December 2012
- Achieve zero PPM from vendors by October 2010

Case Study #1:

Karnatka Automats Pvt. Ltd.

CONTACT DETAILS:

KARNATAKA AUTOMATS PVT. LTD.,
Mr. g. Sathya Kumar (Managing Director)
474/1, 1st 'F' Cross, Bhuvaneswari Road, 8th block, Koramangala,
Bangalore-560095 Karnataka, India

Phone: 0091 - 80 - 41418777
Email: sathyakumar52@gmail.com
Web: www.ktcpl.info