UNIDO - ACMA
Partnership Programme, India

Case Study #2:
Kulkarni Engineers







BACKGROUND OF KULKARNI ENGINEERS

"Being a member of ACMA, we saw a great opportunity to learn and implement world class best practices in management through this Programme.
It has benefited substantively as we were able to achieve high levels of productivity, quality and improved performance in all business domains."

Rajiv Kulkarni, Managing Director

OVERVIEW

Company: Kulkarni Engineers
Location: Pune
Programme period: September 2005 February 2008
Number of employees: 40 (15% women)
Core products and processes: Precision press parts for the automobile industry gaskets, sealing washers, special washers in ferrous and non-ferrous materials.
Average annual turnover: INR 46.8 million (USD 1.04 million)
Value of exports: Nil
Tier: 1 & 2

KEY CHALLENGES FACED

» Low production rate;
» Frequent customer complaints and rejection returns;
» Un-organized workplace;
» High Inventories;
» Low initiative of employees to reduce cost of production.

ASPIRATIONS AND AIMS

» Enter the elite group of suppliers to Mercedes Benz, VW, Ford, GM, FIAT, Honda a n d Cummins;
» Achieve zero defects in product quality;
» Achieve 100% delivery adherence;
» Minimize cost of manufacturing.

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Organizing the workplace

Before

After

The automobile industry was established in and around Pune and other industrial estates in Maharashtra between the 1980 and 1990. The growth of this industry invariably led to the mushrooming of an auto-components base, which comprised many small scale units as well. Companies like Bajaj Auto, Bosch, Spaco Carburettors encouraged several small and medium enterprises (SME) to set up manufacturing units and become reliable and technically sound suppliers with assurance of long-term business relationships. It was within this context that Kulkarni Engineers (KE) was established at Gandhi Bhavan Industrial Estate, Kothrud, in 1985.

Two rooms with an area of 400 sq. ft. were rented to start production with four to five workers. The initial machinery installed included three arbor presses, one fly press, one power saw, one leg operated shearing machine and one lathe. The company decided to design and make its own tools and dies and to start a press shop to produce gaskets and washers as this segment required minimum capital investment and offered the possibility of high volume production with the help of semi-skilled and unskilled workers.

During 1985 to 2001, KE, with its resources of 3 presses and 20 workers, manufactured and supplied gaskets and special washers in copper, aluminium, CAF and cellulose fibre material to 15 customers. The Output ranged from 1.5 million to 2.0 million parts per month. During 2001 to 2005 with the resources of 30 workers and six presses, the company supplied to 30 customers. Output increased to 2.5 million parts per month. KE's key customers were: Bajaj Auto Ltd, Bosch Chassis Systems India Pvt Ltd, Endurance and Spaco. In 2003, the company got accredited to ISO 9001-2000.

Despite of those achievements, the company faced a series of challenges arsing from customer complaints and returns. In-house process rejection, under-utilized machine capacities and high inventories were other problematic areas management had to deal with. The company's intentions to improve these domains got diluted, due to a lack of direction. It was a sign of relief for the management of KE when they learned about the UNIDO-ACMA Partnership Programme, and they immediately decided to go with the programme.

VISION STATEMENT

To become a business leader in automobile press part with highest competency in productivity and reliability.

MISSION STATEMENT

The company plans to achieve maximum productivity by eliminating defects through design excellence and minimising wastes within the processes.

KE'S JOURNEY TROUGH THE PROGRAMME

Designated locations for tools, dies and fixtures

The programme started in KE in September 2005 and lasted for a period of 30 months. It was a co-incidence that Kulkarni Engineers was assigned Mr. P. D. Kulkarni as counsellor, one of the most experienced National Experts in UNIDO_ACMA Partnership Programme. At inception, Mr. Kulkarni visited the company and met the CEO to understand the major challenges faced low productivity, quality issues and lack of employee motivation. The CEO subsequently introduced the expert to all employees of the company in order to communicate the firm's goals with respect to the programme and to involve them already in the initial stages. During the introduction the counsellor emphasized that the programme, when implemented, could transform the habits and attitudes of all employees by instituting a cultural change through the involvement of all levels of the workforce. Initially, the programme focused on implementing 1S, 2S, the first two steps oft eh 5S workplace improvement methodology, with employee involvement resulting in a more organized workplace.

Over the following few weeks the total area occupied by the company was divided into four zones namely office, stores, production and tool room, and leaders were nominated for each zone. With the support from management, the Kaizen concept was introduced in order to involve employees in 1S, 2S and waste elimination in respective areas. This also lead to improve visual controls in the production processes. Additionally, to monitor performance in each area, systematic data collection and analysis of data was made compulsory for all participants. Visits of employees to cluster companies also gave significant exposure and motivation to learn from each other.

Overall, the counsellor worked with and accompanied KE over a 30-months period, paying a total of 45 visits and holding monthly review meetings within all companies of the programme that were located within the same region to promote peer review, motivation and inspiration..

IMPROVING PRODUCTIVITY BY REDUCING WASTE, ORGANIZING THE WORKPLACE, AND INCREASING THE INVENTORY TURNOVER RATIO

REDUCING WASTE BY IMPLEMENTING THE KAIZEN CONCEPT

Machine operators were made to realize that only by 'waste elimination' in processes, productivity and thus profitability could be increased. Employees were encouraged to evaluate the steps that generated waste/loss and to come up with enhancements that would reduce the level of waste generated at each step. For instance, steps taken to standardize bins, bags and containers for touch-free and count-free packaging not only reduced waste, but also saved operators time and efforts, allowing them to focus on value additive tasks.

ORGANIZING THE WORKPLACE

Safety, security, improved productivity and quality were highlighted as direct products of cleanliness on the workplace and 2S was implemented on throughout the shop floor. As part of 2S implementation, actions were taken to identify and highlight designated locations for every tool, component, raw material etc. and each item was then placed in its designated location. The use of red tags helped in the identification and disposal of unwanted material and yellow tags were used for items that may be required in future but which were occupying scarce floor space. A target was given to move unwanted materials to the red tag area for disposal. This practice made a noticeable change in all areas and orderliness was visible.

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Organized work area

Before

After

IMPROVING INVENTORY TURNOVER RATIO (ITR)

During a visit of the factory, the counsellor and shop floor manager recognized clutter and inefficient use of available space as factors impeding productivity improvement measures. These factors also limited the ITR since the company had to order raw materials in large batches and significant time was spent by operators in sorting through and organizing the raw materials before they could be used in the production process. By reducing the quantity ordered and by increasing order frequency at the advice of several operators, inventory levels were significantly reduced and less time was wasted on peripheral tasks such as sorting through materials and arranging it in the storage rooms.

PRODUCTIVITY AND QUALITY IMPROVEMENT THROUGH STANDARDIZATION AND "MY MACHINE CAMPAIGN"

STANDARDIZATION DRIVE

Standard Operating Procedures (SOP) were introduced to make operators understand and work as per the defined systems, by using the correct tools and in the defined order of steps. In addition, so-called One Point Lessons (OPL) were displayed near workstations to highlight "Do's" and "Dont's" by using photographs and simple instructional flyers. This was again a powerful and direct method to make operators aware and conscious about product quality. These initiatives paved the way for the company to achieve significant results in the reduction of customer complaints and in-house rejection parts per million (PPM).

MY MACHINE CAMPAIGN

This exercise was undertaken to help operators gain a deeper understanding of various machine elements. Supervisors were responsible for ensuring that all operators cleaned, lubricated, and inspected their machines on a daily basis and the negative impacts of not performing these actions were communicated.

ENHANCING EMPLOYEE INVOLVEMENT

When the counsellor initiated the programme in KE, there was no place defined or marked where materials, equipment and tools could be stored. Machine placing on the shop-floor was haphazard and places for sitting and performing other operations were non-existent - workers sorted and counted material while sitting on floor.

Training on 1S and 2S made the operators understand better the need of the drive and they were finally able to visualize and distinguish between good and bad practices. They were motivated to bring forward suggestions and the support needed to implement those was provided by the management.

In order to make operators more accountable for their machines and production, a Daily Production Report (DPR) format was introduced. The format was printed in the operators' native language and highlighted details on production start time, reasons for interruptions of the workflow, production targets, actual output, material consumed, etc. In addition, counters were introduced on each machine so that digital readouts provided real time statistics on several production parameters. Employees were evaluated based on their DPRs and outstanding performers were rewarded.

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OUTCOMES

Re-located press machines

Before

After

KEY RESULTS

Between 2005 and 2008 the company achieved the following key results:

» Productivity increased by 700%
» Customer return PPM reduced from 6,300 to 65
» In-process rejection reduced from 9,000 to 2,300
» Value added to personal cost improved from 2.35 to 5.61
» ITR increased from 5 turns/year to 20 turns/year
» Absenteeism reduced to less than 5%
» Delivery schedule adherence rose to 92%

The UNIDO-ACMA Programme enabled the company to achieve higher productivity, improve the quality of its products and enhance its overall business performance through greater employee involvement.

Reaching a productivity level of 700% was the result of a joint effort between the operators and the design engineers. Major impacts were achieved through operation clubbing i.e. two to three operations were covered in one single stroke of the press. Furthermore, design innovations played a pivotal role in achieving these results..

Operator-driven improvements carried out in the tooling and production process became habitual work practices and Kaizen is now part and parcel of the company's problem solving processes.

Other benefits encompass better space utilization, overall tidiness on the shop floor and higher turnover with no increase in expenditure.

As a result of these improvements, significant financial and business results were achieved, such as:

» Net sales increased from INR 26.6 million to INR 40.3 million
» The company was able to develop 95 new components and add 40 new customers
» The output of parts increased from 2.5 million to 5.5 million per month
» The company was awarded the "Gold Quality Award 2008" from Endurance Technologies, a longstanding customer

IMPROVEMENTS			
	Before	**After**	**Change(%)**
Productivity (production/man-hour)	330	2168	**+700**
Absenteeism in %	6.1	4.8	**+20**
Customer complaints in number	12	3	**+75**
OEE in %	71	75	**+6**
Customer return PPM	6,348	65	**+989**
VAPCO (Ratio)	2.35	5.61	**+100**
WIP INR million	0.65	0.33	**+50**
New Customer added in numbers			**40**
New Product added in numbers			**95**
Tangible savings in operating costs (USD / year)			**120,000**

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

FUTURE OUTLOOK

Front entrance of Kulkarni Engineers

THE SUSTAINABILITY CHALLENGE

The long-standing employees of the company, who were trained by the counsellor and developed into 'sources of excellence', were given the responsibility to train new recruits and pass on their knowledge. In addition, the company developed a programme for regular training and mentoring the employees to ensure the continuous implementation of kaizen, 5S and productivity improvement initiatives.

The company has further contacted the CEOs of other participating companies in the same cluster to visit and guide in cases of new line setups. The CEO is reviewing the progress once a month.

Finally, KE is continuing the work on design excellence in press tools to ensure adequate quantities and quality.

FUTURE TARGETS

- Implement mistake proofing for all the tools by the end of 2010.
- Acquire ISO/ TS-16949 certification by the end of 2010.
- Achieve an OEE of 85% by mid 2011.
- Reduce in-process rejection less than 1000ppm by the end of 2010

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