

UNIDO - ACMA
Partnership Programme, India

Case Study #8:

Samarth Engineering Company Pvt Ltd (SECO)



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“The UNIDO-ACMA Programme has by far been the most beneficial programme that Samarth Engineering has ever embarked upon”.

Killol Kamani, Managing Director

OVERVIEW

Company: Samarth Engineering Company Pvt. Ltd.

Location: Jamshedpur

Programme period: February 2008 – July 2010

No. of employees: 164 (3 % women)

Core products and processes: Pressed, fabricated components and assemblies for chassis and body assemblies (assy. bonnets, assy. front panels, assy. cross members, skin panels, assy. reinforcement, assy. wheel arch and mudguard, axle and doom covers, etc.)

Average annual turnover: INR 240 million (USD 5 million)

Value of exports: -

Tier: 1

KEY CHALLENGES FACED

- » Under-utilization of existing resources (space, workforce, machinery and material)
- » Limited involvement of employees in problem solving processes
- » Inefficient movement of material
- » Accidents and un-safe working conditions on the shop floor

ASPIRATIONS AND AIMS

- » Become the most preferred supplier of sheet metal components, assemblies and fabrication to TATA Motors LTD.
- » Achieve zero defects in product and customer returns, and zero complaints
- » Ensure on time delivery
- » Achieve optimum production at low cost

BACKGROUND OF SECO

Established in the year 1976, SECO is one amongst several entities belonging to the Kamani group of companies, located in the industrial hub of Adityapur in Jamshedpur. In the beginning, the company started with 4 products and a total of 10 employees. The business was started on an area of 7,000 sq. feet and achieved a sales turnover of INR 0.5 million. Over time, the company developed an impressive range of products, varying from assemblies and fabrication for light to heavy commercial vehicles. Nowadays, the company manufactures 127 products of different categories. SECO has increased its turnover by more than INR 200 million and is now supported by a team of 164 employees. Over the last four years, the company has been operating on an area encompassing 53,000 sq. feet and is still generating space for further expansion. For the last three decades, SECO has supported the requirements of Tata Motors Ltd. (Jamshedpur and Lucknow plants) and enjoys a stronghold there, as it is known for supplying quality products. Equally, the company has become one of the preferred suppliers for Tata Motors' World Truck Project. Amongst SECO's other customers are RSB Global, WABCO-TVS India Ltd, York Transport, Caparo Engineering as well as other engineering industries.

With quality at the fulcrum of its existence, SECO has always participated in product development and growth by rapidly and accurately translating drawings into products and managing to match even the most complex specifications. The achievement of ISO/TS-16949:2002 in August 2007 shows SECO's commitment towards supplying quality products by process improvement and technological up-gradation, while attaining the optimum level of customer satisfaction. Moving from one milestone to the next, SECO has achieved a steadfast pace growth of 60% in 2006-07 and 32% during 2007-08.

Though the company was growing and largely achieving its targets, it was still unable to find ways to improve its productivity levels. Severe accidents on the shop-floor had an impact on employee morale and performance. Furthermore, there was a huge gap between machine capacity and output, and a lot of time was wasted with changeovers. Tools and dies were spread on the floor, which made it difficult for workers to identify them. From the moment SECO's management learned about the UNIDO-ACMA Programme, it was excited and decided to go with it.

VISION STATEMENT

To become a 'world-class player' – in line with our guiding principle “Customer Delight through Quality” – through continuous improvement initiatives, maintaining quality standards and increasing productivity through value engineering and cost reductions.

MISSION STATEMENT

Achieve process excellence through trained and skilled workforce and by adopting error-free methods.

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SECO'S JOURNEY TROUGH THE PROGRAMME

Monthly Review Meeting



Daily cleaning of the production area involving all employees



The UNIDO-ACMA Programme started in SECO in February 2008 and covered a period of 23 months. The assigned counsellor, Mr. T. K. Chanda, visited the company and called for an initial meeting with the CEO and other managers to understand their expectations in relation with the programme and to come up with a roadmap to achieve those goals. At a subsequent visit, the CEO and counsellor jointly addressed SECO's employees to introduce the initiative to also them and encourage their participation. Over following months the counsellor visited the firm three times every two months to constantly review the actions undertaken by employees, track the improvements made, identify challenges and problem areas, provide other inputs as per the roadmap, and assign new tasks to the management team.

The counsellor helped SECO comprehend the challenges ahead in line with customer expectations and demands. He explained that it was imperative to implement a continuous improvement process within the whole company to move towards sustained business development and to face the competition. The counsellor not only provided tools, frameworks, and techniques to facilitate improvements, but also supported SECO in its endeavour to fulfil customer requirements and expectations.

This Programme also encompassed visits to other companies dealing in the same area of business to get insights into their processes and trouble-shooting techniques and learn from best practices of peers.

ACTIVITIES UNDERTAKEN (ROADMAP)

One of the first activities included **classroom training sessions** for SECO's, covering topics such as quality management, cost efficiency and on-time delivery of products.

The company's operational areas were divided into **zones** and **zone leaders** were appointed. The counsellor regularly assessed progress made by these zones to ensure compliance with the learning.

The counsellor assisted SECO in setting up an **hourly production control** board to identify processes that produced the highest amount of waste and to evaluate methods to reduce it.

He also stressed the importance of **Kaizen**, a technique to increase productivity at reduced cost through improvement suggestions brought forward by employees.

Managers and employees also received training on **Poka Yoke** (mistake proofing) and were encouraged to implement their learning at their work stations.

Awards were handed over to employees for the best performers in different categories, such as best kaizen, best operator, best supervisor or best attendance. The CEO directly interacted with employees at these award ceremonies and provided them with updates on the overall progress made by the company under the UNIDO-ACMA Programme.

In addition, **monthly review meetings** (MRM) were organized jointly with other companies from the same region that were assisted by the same counsellor under the UNIDO-ACMA programme. The approach followed in these meetings foresaw that all participating companies would visit each others' plants, jointly appraise progress made and provide feedback on opportunities for improvement. These visits were crucial in sharing best practices across the spectrum so that they could be replicated in other firms of the same cluster. MRMs have also proven to a great motivational tool as the interaction amongst peers fostered an environment of friendly competition.

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Die storage system



Before



After

Working place modified



Before



After

ORGANIZING THE WORKPLACE FOR OPTIMIZED RESOURCE UTILIZATION

One of the primary areas of improvement that the CEO had outlined at the beginning of the Programme was the **inefficient use of resources**, including the floor space available within the plant. The counsellor in cooperation with SECO's management addressed this issue by focusing on **re-organizing the workplace** and bringing about a cultural change related to tidiness and cleanliness.

The **storage of tools and dies** was haphazard and there was a lot of wear and tear on expensive components, due to mishandling and improper usage. At the same time, employees spent an inordinate amount of time searching for dies and tools that could have been avoided through a more systematized arrangement. This problem was readily identified, diagnosed and tackled by employees with the support of the counsellor. Now, after the improvement activities have been implemented, each die is kept at a designated spot with proper identification to enable for an optimum utilization of space and to prevent further waste of time by searching for the correct die.

Other steps taken to optimize the utilization of available space included the following:

- » **Downsizing of the scrap yard area:** Initially scrap of different types was kept in two different areas, which were 30 metres apart from each other. Thus, the area in between was underutilized. As a response, the scrap placement locations were aligned differently to make sure that no space was wasted and the frequency of clearing the scrap was increased from 10 to 15 times per month to increase the scrap turnover rate.
- » **Vertical space utilization:** Bins, components, raw materials and tools were initially placed on the floor in an un-systematized manner. There was no defined place for any of the given items. Everyone was used to place material/tools/dies anywhere as per his/her convenience. This created difficulties for employees that were searching the dies or material for the next use, thus wasting a lot of time and complicating movements and ergonomics. In addition, the chances of accidents occurring increased. In order to overcome these problems, the concept of vertical space utilization was taken into consideration and items such as sheets or dies were stacked vertically in distinctly labelled places.

TOWARDS ENHANCE QUALITY AND PRODUCTIVITY

High rejections rates at the customers' end plagued the company for quite some time. Therefore, one of the primary expectations of SECO's management from the UNIDO-ACMA Programme was to achieve a reduction in parts per million (PPM) rejections. An independent Quality Assurance Division was set up with the mandate to check all components produced in order to ensure compliance with customer demands and expectations. Special Kaizen project presentations were conducted by different zones to share initiatives that had improved quality and reduced rejections both, in-house and on the side of the customers. These meetings resulted in the creation of a **Kaizen database** which was regularly referred to by employees whenever they were faced with a quality related issue or challenge.

Employees were encouraged to apply **Poka Yoke** (or meaning mistake-proofing) in different processes to enhance quality. Zone leaders were responsible for monitoring the progress made by the various workstations where rejection rates had been high. Each zone was required to set up a visible board listing all relevant key performance indicators to foster competition amongst the zones.

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Example of visual control



Loading of tools by modified clamps



Before



After

In addition, steps were taken to standardize processes to the extent possible in order to further reduce errors. **Visual control boards** were set up near each zone to display the production and machine setup processes. A major change was made in the design of clamps that were used to mount tools into machines: instead of loading and unloading tools in a sequential clamp, the design was altered to load the tool from one side of the bed and to unload it from the other side, thus making loading and unloading a parallel exercise. This change reduced wear and tear on both, the clamp and the tools, and reduced rejections towards the end of the lifecycle of a tool. At the same time, operators had to ensure that all the tools, raw materials, and cushion pins were placed near the machine to avoid excess movement and improve ergonomics. In addition, operators were asked to benchmark improved processes and learn from each other to institutionalize the processes improvements.

The **layout of the shop floor**, which comprised a press shop, an assembly shop, a tools room, a paint shop, powder coating and surface treatment facilities as well as material handling facilities, was arranged in a way that a large amount of space was being wasted and the flow of materials and products was impeded. Based on the training imparted by the counsellor and employee kaizens, the layout was modified to streamline material movements and to arrange machines and tools in the order in which they were used in the production processes. New layouts were set up also for the assembly lines and storage lots, which reduced the average transport distance of tools and parts in order to be utilized in the production process.

Furthermore, **production patterns** were changed from batch to flow in three cases, thereby reducing cumulative Work In Process (WIP) by 80%. Previously there was no concept of flow production in SECO. Material was produced in batches, which led to the generation of high WIP between the stations.

Sometimes, material was kept on shop floor near the station, causing delays and creating an unsafe work environment for employees. At the same time, too much handling resulted in lower productivity, quality issues, additional space needed, as well as excess manpower requirements for material movements. In order to avoid such problems, the company undertook training on **value stream mapping** and mapped the location of equipment needed in the production processes. All necessary data such as manpower requirements, cycle time, and WIP at every station, as well as the material movement and distance between two stations, was gathered and assessed. After having analyzed the data and gathered feedback from the operators, the entire process map was re-designed. In this process, a focus was placed on creating a streamlined operation whereby operators had to expend the least amount of time and effort on non-core (value adding) activities. By taking such steps, SECO was able to reduce the time needed to produce a batch of 70 parts from 12 to 8 hours. Furthermore, the average material movement distance was reduced from 360 feet to 25 feet, and space requirements also reduced from 3800 sq. feet to 890 sq. feet.

Further analysis was conducted to reduce the amount of time that was necessary to setup and prepare equipment and machines. Zone leaders focused on the most critical machines to **reduce down time and WIP levels**, thereby implementing a **just-in-time production concept**. Given the amount of time required to change tools and dies, the company usually only performed one or two die changes within 24 hours. To compensate for the limited flexibility in this regard, excess quantity of parts would be produced, which negatively impacted SECO's efficiency, increased waste and rejection rates, and also resulted in huge WIP on the shop floor. In order to tackle this issue, the company started by focusing on the 500T hydraulic press machine, that has been defined as one of the most critical ones. Several issues were discovered within a short period of time and simple fixes, such as installing a standard die spacer block for different components, were installed.

A new clamping device was also introduced, which significantly reduced clamping time. Furthermore, a centre line was marked on all tools as well as on the bed, in order to ensure that cushion holes matched. Before this intervention, the general practice during changeover time was to unload one die and place it on a trolley, while another operator waited to place the used die in the same slot. This process was redesigned so that loading and unloading of dies could be done simultaneously - i.e. unloading could be done from the front and loading from the back of the machine. Through this measure, die change over time came down from 60 minutes to 20 minutes. Once these fixes had been implemented and tested with a set of critical machines, steps were taken to apply the same to other less critical ones as well.

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OUTCOMES

Award from Tata Motors in recognition of
"significant improvement in logistics"



SECO's participation in the UNIDO-ACMA Programme has enabled its management and employees to better understand the practices and demands of other participants and players in the industry. The company was able to improve productivity by 36% through a strong focus on flow manufacturing and on reducing change over time.

The implementation of Poka Yoke (mistake proofing) reduced customer complaints by 60%. This has been advantageous by allowing SECO to benchmark best practices and improve quality. The company has set up a lab with excellent gauges and now also disposes of a separate room to check visual defects such as scratches that are not visible in normal lighting conditions.

Furthermore, 136 square metres of space were generated through the various activities of this programme and the workplace has become much safer as a result of the improvements achieved. The involvement of employees in problem solving and improvement processes has also increased and their morale has boosted. They have been given an understanding of systematic approaches towards problem solving, and continue to benefit from the learning that was imparted to them. Kaizen is now an integral part of the problem solving process and employees are encouraged to voice their opinions in a constructive manner. SECO's management is encouraged to provide feedback to employees and has paved the way for open lines of communication.

Customers have also recognized the changes at SECO and the efforts made to achieve such transformation. As a result, the company was able to added 8 new customers and 12 new products.

KEY RESULTS

- » Productivity increased by 36%
- » About 74 sq. m. of space freed up in scrap yard, 29 sq. m in flow production and 33.4 sq. m. through the relocation of dies
- » Absenteeism has reduced by about 30% and the overall level of employee involvement has increased
- » Customer complaints reduced from 5 to 2 per month
- » Overall equipment efficiency (OEE) has improved by 73%

IMPROVEMENTS			
	Before	After	Change (%)
Productivity (Production/man-hour)	12.5	17	+36
Scrap Yard sq m	99.68	25.10	+75
Absenteeism in %	9.1	6.3	+30
Customer Complaints in numbers	5	2	+60
Accident severity ratio	5,959.62	0	+100
OEE in %	38.8	67	+73
New Customer added			8
New products added			12
Tangible savings in operating costs (US\$ / year)			18,000

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

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FUTURE OUTLOOK

Company entrance



THE SUSTAINABILITY CHALLENGE

In order to maintain the improvements achieved, the SECO plans to continue to apply the tools, techniques and methods it has learned over the duration of the UNIDO-ACMA Programme.

Some of the key initiatives for the future include the following:

- » Continue training and application of Kaizen, waste elimination, safety, and 5S
- » Monitor autonomous maintenance, embark on quality improvement programmes, and keep employee motivation high
- » Review of the progress on key initiatives by the CEO and management on a regular basis. Results will be shared with all employees and suggestions to speed up progress will be sought at all levels

FUTURE TARGETS

- » Add a minimum of two new customers by 2012 and solidify the relationship with Tata Motors Ltd.
- » Reduce customer returns to less than 200 PPM by mid 2011
- » Improve skills matrix of employees by increasing training hours from 1hr/employees/month to 1.5hr/employees/month

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