



CASE 3

ESAB INDIA LIMITED

ESAB India Limited, Bombay, is a leading manufacturer of welding consumables and equipment. ESAB India Limited is the Indian associate of ESAB AB, the Swedish multinational and the world's largest company in welding and cutting, with production centres or representation in most of the countries.

ESAB India, a Public Limited Company with paid up capital of Rs. 50 million, employs 206 people, including 35 S&T personnel, at its Kalwa unit (Bombay) which is the major manufacturing facility. It had a turnover of above Rs. 30 crores during 1991-92. It is licenced to make 1250 nos. of welding a cutting equipment and 24020 k m of welding electrodes.

The in-house R&D unit of the company employs about 10 persons including S&T personnel (scientists and engineers) and is headed by a well qualified (Ph.D.) Chief at the level of General Manager directly reporting to the Managing Director. The R&D unit is a separate entity situated within the company premises occupying a floor area of about 300 sq. mts. but closely interacts with other functional groups. It has well equipped laboratories and pilot plant facilities for development purposes. The annual R&D expenditure was about Rs. 24 lakhs during 1991-92, i.e. about 0.8% of the annual turnover. A good technical library having books, journals and periodicals in the field of manufacturing is maintained. The company also encourages close interactions with the relevant R&D organisations and academic institutions. R&D personnel participate in technical seminars and meetings in India and abroad. A computerised information facility has also been built up.

The R&D unit of the ESAB India closely interacts from time to time with the principals in Sweden and at other places on developmental needs and receives relevant technical information which is very useful for R&D in India. In fact, there are some products/areas which have specifically been developed to meet the needs of India and could be relevant to other developing countries as well, but are not covered in the product range of the principals abroad. Most of the developments relate to highly specific applications such as for oil, power, underwater uses and are import substitutes. There are immense export possibilities through constant development efforts to meet the specific requirements of other countries.

In the early eighties ESAB realised that to survive in the competitive world of welding it had to become the biggest company and a leader in technology. As a route to achieve this objective ESAB acquired a number of companies active in the field of welding and cutting. It acquired the European welding activities of Philips electrical and electronics group, based in the Netherlands in 1985. Subsequently, the welding business unit of Philips India Limited also became part of ESAB Group in July 1988. This unit was not doing well commercially. The turnover of ESAB (India) almost tripled in three years due to active marketing efforts. In May 1991 ESAB India Limited acquired the welding business of Indian Oxygen Limited (IOL), Calcutta. The turnover then approached Rs. 100 crore. The new Indian organisation now has four major manufacturing centres and has sales outlets in all parts of the sub-continent.

Technology Strategy and Policy

ESAB's objective was to become world leader in welding technology. This was to be achieved by carrying out inhouse research and by absorbing the technology of newly acquired companies. ESAB now has well established R&D facilities in a number of countries, including India. The R&D unit of ESAB (India) is a DSIR recognised unit and works presently mainly for the Indian market. In setting the objective of ESAB India, the top management of the parent company takes into account the inhouse capability and potential for further advancement through imported technology. All possible support to R&D is extended by the management to retain the leadership in its field.

The company's commitment to welding technology and product development is evident from the goal of

Case (1992) prepared by Dr. S. Bhattacharya, General Manager, R&D and Quality Assurance, ESAB India Ltd. The author wishes to acknowledge the cooperation of the management of the Company in permitting him to write and publish the case.

Case material has been prepared to serve as a basis for class discussion. Cases are not designed to present illustrations of either correct or incorrect handling of managerial administrative problems.

Copyright (c) of IGNOU



the organisation which is to provide technical solutions to the customers. Here the organisation insists on the important distinction that it provides solutions and does not sell products.

In a world where technology dominates there are new opportunities for continuous development. The development of low moisture absorption welding electrodes is a good example; The offshore structures of the North Sea required welding consumables (electrodes) which would produce welded fabrication free from structural failure in a very harsh working environment. The cost of such failures could be tremendous compared to the cost of welding consumables. Typically, welding consumables constitute less than 1.5% of the total cost of the structure. The cost of failure of the structures is frequently many times the cost of the structure itself.

The early objective was to have extra low hydrogen in the weld metal. For this purpose special low hydrogen electrodes were made and then rebaked just before use. This costly process could be eliminated by packing the electrodes in vacuum sealed packages (Vac Pac) at a relatively high cost. Efforts at developing the low cost devices for packing continued. The low moisture absorption electrodes have now been produced which reduce the cost of the solution of the welding problem. At the same time the product was further developed to give improved welding characteristics in order to improve manufacturability and to reduce cost.

Expenses incurred on product and process development have to be recovered from sales so that R&D process for continuous improvement can go on. The key words which characterise ESAB's commitment to the continuous development of processes and systems are:

- the productivity of the welder and fabricator
- the quality of the weld deposit
- the working environment

Productivity

During the last decade and a half a shift from the manual welding process to semi and fully automatic welding processes has taken place in most of the developed countries, mainly to achieve higher productivity and lower manufacturing cost. Today in these markets more than half of the total production of weld metal derived from continuous solid and flux cored wires processes. It, therefore, became necessary to develop consumables to meet this challenge. Many new automatic consumables have been added.

There was a parallel development of new welding machines to match the automatic welding processes (including welding robots). The packing standards were also changed to suit automatic welding consumables for uninterrupted supply of high-quality wire to the robotic welding processes (e.g. ESAB's Marathon Pac).

Quality

Products and services which do not meet the quality requirements of the customers do not stand the test of time. Today quality does not remain within the boundaries of the product alone. Total quality is the need of the hour. Introduction of a Total Quality Programme in the ESAB Group is a step in this direction. While finalizing the requirement for a new product the quality of the weld is inbuilt in the specification, Welding is not an end in itself. It is a process to produce a structure. The most successful welds produce the best component or fabrication at the lowest total cost.

Environment

The cost and quality of the weld very much depend on the welder who in turn is profoundly influenced by the working environment. The welder will produce better welds in a "friendly" environment or with electrodes with improved welding characteristics, a single point control (synergic control) of the welding machines and reduced fume. Controlling the toxicity limit of the welding fume shows concern towards the health of the welder whilst at the same time improving his effectiveness. ESAB's R&D is in the forefront of action to make the environment more friendly to the welder,

As can be seen, developments in welding concern the whole process and are realized by improving existing products and introducing new technologies. Attention will, in future, focus increasingly on issues relating to the internal and external environment and ergonomics. Combining ESAB's product and process research and development with the customers' production experience often lead to collaborative ventures to improve economy, quality, productivity and safety standards in the latter's works.



ESAB India Scene

The R&D department of ESAB INDIA is the focal point for all technical activities of ESAB in India. It also acts as the interface between the principals in Sweden and the Indian organisation. It undertakes research and development activities related to new products and technologies for meeting the needs of the growing Indian market. Emphasis is on continuous local technological development and absorption and upgradation of imported technologies for all the welding activities.

The department is manned by a group of highly qualified and experienced persons who have experience in other line functions so that their perceptions of the problem are realistic rather than theoretical. Members have had previous experience in quality control, production or marketing before they joined the R&D Group. They are capable of understanding the real problems or the requirement of new products as envisaged by the customer. All members of the department help each other to keep expectations within feasible limits.

Technology and product development is market led in India. For instance, in a specific nuclear project the requirements were very stringent and critical. The required product was developed in two phases. In the beginning the technical requirements were first met and subsequently the cost was reduced. Initially the market demand was not large but with time it expanded and now we have a proprietary product with large demand.

Many such market led developments have been successfully carried out in India. This has helped ESAB earn the name of a technology based company. The R&D department accordingly has established its importance in the organization and has representation in all decisions of the Group Management pertaining to technology and product management.

Methodology

If the product development is market led the marketing department has to present its requirements in regard to future market demand, possible new businesses or new applications. Once the need has been agreed the R&D department attempts to ascertain whether the product is available within the ESAB Group. If it is, the principals abroad are contacted for details of formulation and production data. In the event that a group product cannot be identified, then the R&D department of the principals combines with the Indian counterpart for a programme for development. After establishing the basic formulation and production data, work on adaptation to Indian conditions starts. (This adaptation is necessary because of variations in the raw materials and production plant.)

The formulations are broken into their basic chemical constituents and on them the chemical composition of the indigenous raw materials is superimposed. Imbalances are suitably adjusted to provide the correct weld metal analysis and welding characteristics of the electrode. Theoretical knowledge and practical experience are essential for doing this. A tentative formula is obtained which is refined through experiment to give the final desired product. The new formulation is first tried on pilot plant and subsequently transferred to production. For successful development and commercialisation of a product, marketing and sales, materials management and production departments are all involved. The R&D personnel remain involved till the product is established commercially. R&D must also be involved in manufacturing technology to meet the company's own demand for improved productivity, quality or to increase manufacturing flexibility.

Difficulties Encountered

What has been discussed above works if the situation is ideal. Reality is often different. Some of the major difficulties encountered in actual practice relate to:

- changes in specifications during the development period
- failure to achieve the required result by the R&D department
- unduly long. response time of development
- prohibitive cost of product.

In the course of the development the customers' needs may change. If such a change is not very major, it may only cause a small delay but in case of major changes it may mean development in an entirely new direction. Alternatively, the specifications may sometimes be too stringent that it may not be possible to manufacture a new product within the constraints and the projected cost. It is also possible that the largest laid down in the guidelines



received from the principles cannot be met because of non-availability of specific raw materials at reasonable prices. These are all major handicaps in developing the desired product.

Undue delay in developing a product may result in losing market opportunity for which it was intended. Often development may use costly materials and the finished available product may become more expensive than an alternative product in the market resulting in failure to develop a commercially viable product. All problems and difficulties described above combine into one single problem-loading the interest of the customer. These difficulties can arise in market led development. However, if development is production led, many new and good developments never reach the market because they do not satisfy a recognised customer need. In relation to development activity, the following observations of general nature can be made:

1. The top management must commit itself (through the company objectives) to render active support to development of product and technology. Often in hard times expenses incurred to development come under the microscope. The commitment of the top management will ensure that in the long-term, investment in R&D activities will pay off handsomely.
2. Development is not a single department's job. Active involvement from marketing and sales, production and materials management is essential to make the new product reach the customer ... at right time and at the right cost.
3. Cost of the product plays an important role in the development efforts. This point must be kept in mind from the very beginning. A developer must be fully conversant with the cost structure of the product.
4. All industrial R&D activities must have commercialization of the development as its goal. Any development will be termed a failure if it does not improve the bottom line of the organization.
5. Many difficulties may be faced during the R&D process, so no R&D is assured of a quick and easy success.
6. Guidelines and directions from the principals from abroad are only part of the story. Local R&D is important to satisfy local needs and constraints. "Appropriate technology" is the need for all R&D effort while adapting products and technologies from abroad.
7. ESAB India's role in future will be to develop the existing techniques and to participate in the research and development of new techniques with a view to maintain its leading position in the field of welding and cutting in the 21st century.

Opportunities for ESAB India

In the International scenario the technological developments are taking place at a very rapid pace. India with its wealth of technical expertise should adopt overseas technological advances for speedy commercial implementation and benefit from them. Such adaptation will hasten the process of industrialisation, Indian R&D efforts should be directed initially towards meeting the local needs and overcoming local constraints by suitable adaptation but finally we must aim to be a world competitive supplier of welding and cutting solutions.

Questions

1. What strategic route ESAB AB followed to become technology leader in the world? What could be the reasons behind such a route?
2. What efforts were made by ESAB AB and ESAB India in the field of product development?
3. How is the R&D function at ESAB India organised? Critically examine,
4. What difficulties ESAB has experienced in relation to product development efforts? What would you suggest to overcome these difficulties? What opportunities are open to ESAB India? How best can it avail of those opportunities?