

VALUE ENGINEERING AND ORGANIZATIONAL DEVELOPMENT

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ABSTRACT

This paper reminisces, the journey of Fan division of Crompton Greaves through time, outlining the condition prior to introduction of VE and the transformation that swept through over the years. It discusses the methodology adopted to carry out the improvements, through VE, leading to organizational development. The paper analyses and tries to determine the elements of the successful VE program.

INTRODUCTION

The Fans and Appliances Division of Crompton Greaves, has always maintained its strong presence in Indian market, with over 20% share for its household fans, in a market where cutthroat competition prevails. My curiosity as to how Fan Division has sustained pace with market, took me through a study of factors, over which we have no control. Like, the constantly changing political scenario, the effects of fiscal policies of the Government, economic crises caused by shattering rupee value etc. One of the

reasons, which stood out is the adoption of VE as an effective business tool.

CORPORATE PROFILE

Crompton Greaves is a multi divisional, multi location company, with operations grouped as under:

Power systems: comprises of Transformers, Switchgear & controls, and Engineering Project Division.

Consumer products: Comprises of Fans & Appliances, Lighting, and International Division.

Industrial systems: Comprising Motors, Railways & Transportation, including signaling, Industrial system & Power generation

Digital: Industrial Electronics, Business communications, Public switching, & Transmission Value added products & systems and Infomatics.

Fans & Appliances Division is the largest of the group, engaged in the manufacture of household fans, industrial fans and domestic appliances for Indian & overseas market. Fig-1, shows Fan Division's strong presence in Indian market.

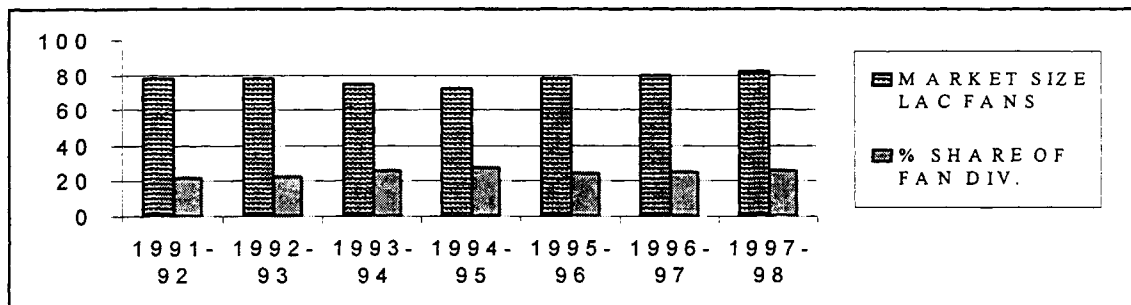


FIG. - 1 SHARE OF FAN DIVISION IN INDIAN MARKET

BACKGROUND OF VE ACTIVITY

Value Engineering, as a concept, was new, in CG environment, until it was introduced in 1984, primarily as a cost cutting tool. A CVS, one of the very first few in India, was appointed as Corporate VE Consultant. Couple of Module - I programs, were organized in the initial phase, by our corporate office. The participants were Managers & Senior Executives, from various manufacturing divisions of the company.

Later, Fan Division took initiative in organizing such programs, with the help of corporate VE Consultant. The frequency of programs varied from one to three per year, depending upon the availability of the consultant. In each program, 3 to 4 projects, related to products, were taken up. The Chief Design Engineer shouldered this additional responsibility

As an outcome of this, the division started accruing savings, but the results were not consistent and started showing a declining trend, even with larger involvement of people, as shown in FIG.-2.

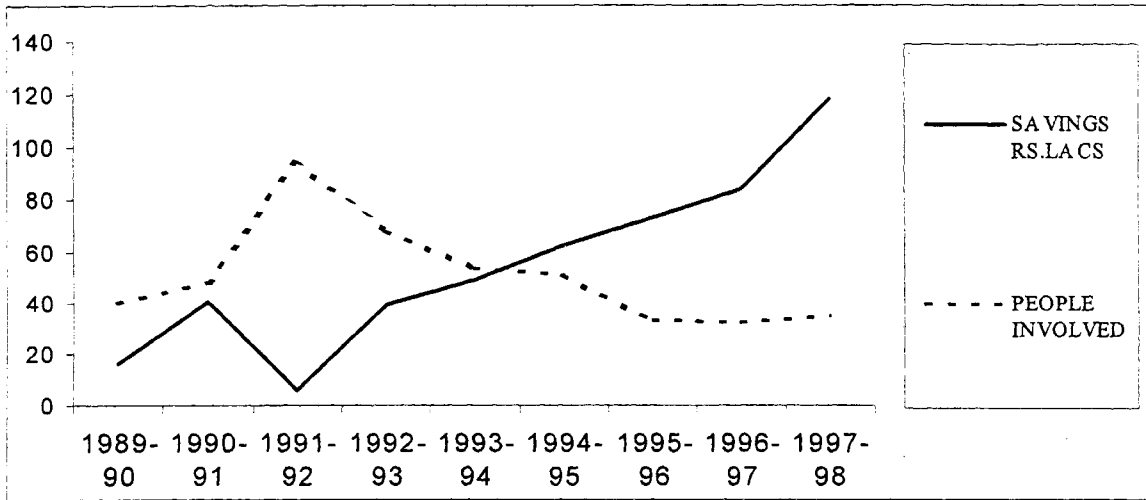


FIG. - 2 TREND OF VE SAVING IN FAN DIVISION

IDENTIFICATION OF CAUSES OF POOR RESULTS

The management identified the following as the causes for the inconsistencies and poor results;

VE had not become part of day to day management.

- i) The program time was convenient to VE Consultant, but not necessarily to project teams. This particularly happened when programs were held during peak business periods, This resulted in people losing focus of projects.
- ii) Selection of projects, based on participants available at that time, was done during VE workshop, The project selection was not necessarily on business priority.
- iii) Many times, Project teams, lost valuable time of workshop, in collecting information itself.
- iv) The involvement of people remained confined mostly to the workshop itself, as

- v) Too many teams & projects, became unmanageable, resulting in half hearted efforts.
- vi) Continuous guidance on VE was absent, as division was dependent on the outside consultant whose responsibility was only to the extent of imparting training.
- vii) Follow-up and monitoring system was absent.
- viii) There was no formal mechanism for generation of ideas .

In order to give focussed attention to VE activity, a Sr. Design Executive, with background of Module-I, was appointed as a full time Coordinator, in 1992.

CHANGES BROUGHT IN BY VE COORDINATOR

A - INVOLVEMENT OF PEOPLE

The coordinator started involving people from various functions. This started with brain storming sessions, held regularly, once in a month. About 15 to 20 people participated in each session.

Within the group, 3 to 4 teams were formed. A variety of topics was given to the teams e.g.

- i) Design optimization
- ii) Manufacturing processes
- iii) Process wastes
- iv) Cycle time reduction
- v) Customer complaints
- vi) Rejection & rework
- vii) Improvement in products

- viii) Material substitution

B - IDEA SELECTION & PROJECT IDENTIFICATION

The ideas collected during brain storming sessions were short-listed by Coordinator, along with a group of Designers & Process Engineers. The selected ideas were classified in three categories viz. short term, mid term & long term. The classification was linked to the time of implementation i.e. 2 months, 6 months & more than 6 months respectively.

This approach helped in early and correct project-identification.

Fig-3 shows the methodology evolved and now practiced for identification and selection of right projects & project teams.

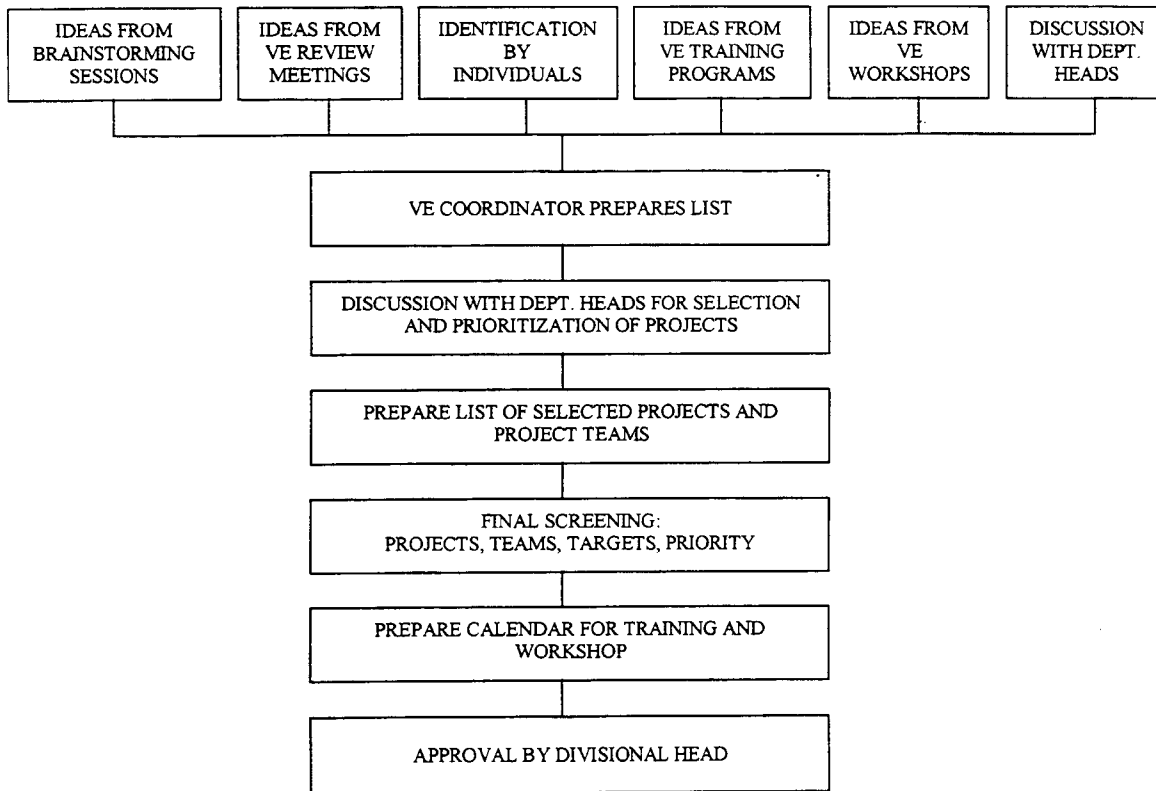


FIG. 3 – PROCESS OF VE PROJECT SELECTION

C – VE WORKSHOPS

Some of the projects, identified through brain storming sessions, were selected for VE workshop, with prior approval of management. The project teams were formed accordingly. Workshop dates were fixed up with VE consultant. Team members & their departmental heads were informed.

This approach helped in allowing enough time for teams to collect information well in advance. Departmental Heads & Sr. Managers were invited at the time of presentation. This resulted in good interactions between project teams & other departments. The projects were periodically reviewed by management until implementation.

D – RESULTS OBTAINED

With the above changes, VE savings started increasing gradually & a clear upward trend was set. This is shown in FIG – 2.

E – TRAINING

It was now felt that, over-dependency on outside consultant need to be reduced. This implied development of competence of own people. The Coordinator then organized Advanced VE Module – II Training program, exclusively for Fan Division. The faculty for this program was none other than Mr. G. Jagannathan, Chairman of CVS Certification Board of India. This program not only deepened understanding of principles of Value Engineering, but also led to emergence of a team with distinct capacity to think diversely. The coordinator then started conducting in-house training programs. These are of three types:

- i) One day VE Refresher Program, for those who had been exposed to Value Engineering.
- ii) Two days program, covering Principles and Applications of Value Engineering, for those who were not exposed to Value Engineering.
- iii) Five days VE Workshop, with three project-teams. This is exactly like Module – I training program.

It is pertinent to note that, some of the Advanced VE Module – II trained Value Engineers, have also become co-faculty during these training programs.

CONTRIBUTION TO ORGANIZATIONAL DEVELOPMENT

A – BUSINESS DEVELOPMENT

As the basic product did not change over a period of time, benefits of Value Engineering were only to the extent of the savings accrued in the cost. Moreover, most of the products had reached the maturity/declining phase of life cycle. At the same time, the competitors started becoming increasingly aggressive. Hence new product management needed urgent attention, to prevent loss of market share. At this stage, the focus of VE was extended to one more area viz. *Value Addition & New Product Development*.

This idea clicked and gave significant mileage to the division, in terms of product range expansion & competitive advantage. The old image of being an orthodox manufacturer of fans was totally changed. Dealers also responded positively by getting involved in New Product Development. FIG. – 4 shows contribution of Value Engineered products to our business.

Product Type	1992	1998
Table Fan Range		
<i>No. of models offered to Market</i>	3	21
Value Engineered Products As % Of Total Volume	15 %	100 %
Value Engineered Products As % Of Turn Over	20 %	100 %
Ceiling Fan Range		
<i>No. of models offered to Market</i>	22	66
Value Engineered Products As % Of Total Volume	50 %	90 %
Value Engineered Products As % Of Turn Over	60 %	95 %

FIG. – 4 CONTRIBUTION OF VALUE ENGINEERED PRODUCTS TO BUSINESS

B – DEVELOPMENT OF PEOPLE

As mentioned earlier, the team charged by Advanced VE Module – II, training program voluntarily took up a project, which could be implemented through out the division. This project was titled “Saving in Electricity Bills (PLH – Power, Lighting & Heating) for Fans & Appliances Division”. A FAST diagram done elaborately, is shown in FIG – 5. Many of the recommendations of this project have been implemented. One of them is de-centralization of compressors, wherein small compressors, installed in various sections, replaced a big compressor. This resulted in both operational convenience and substantial savings for the division.

Next project, done by this team was “ Application of VE to an Office Layout”. This was done at the stage of proposal to renovate an old office. A FAST Diagramming exercise was done meticulously, to understand various functional aspects of an office. This exercise helped in incorporating functional requirements, right at the design & layout stage. This resulted in an elegant modular office, with all the necessary infrastructure facilities,

Enthused by the excellent results obtained, individuals now started looking in to operational areas. One example is *AFTER SALES SERVICE FUNCTION*. The activity of “Satisfying Customer” through after sales service, was looked in to function point of view. It stood out very clearly that, service function plays an important role in Improvement of Quality of products & processes as well. This point is marked with dotted rectangle in the FAST Diagram of Fig. – 6. Learnings from FAST diagram were put to practice, by way of organizing “3P familiarization program”. In this program, regional Service personnel visited our factory, to develop better understanding of 3Ps i.e. **Product** we manufacture, **Processes** used & **People** involved. Another step taken was preparing a list of 25 most consumed spares & circulating it to Quality Assurance, Technology, Production & business heads, for focussed attention and initiating action for improvements.

An exercise on similar line was done by fellow engineers from Materials Department. The FAST Diagram is shown in FIG – 7. This diagram helped in understanding Materials Function & it’s linkages with other departments, in much wider perspective.

Enlightened with the Principles of Value Engineering , our Internal Auditor, applied the same to a non-manufacturing area viz. Octroi Recovery. (Octroi is

an entry tax imposed by the local administration in several states in India).

It was thus clear that VE was well received & accepted by people, handling diverse portfolios within the organization.

MANAGEMENT SUPPORT

The success of our VE programs is largely due to the continued support and encouragement by the divisional management which can be seen from the following:

- i) Adopted Value Engineering, as a business tool.
- ii) Participation of managers in brain storming sessions and VE projects.
- iii) Regular review of VE activity
- iv) Launching of a quarterly journal, dedicated to Value Engineering.

SUCCESS STORIES

Some of the VE projects taken up by the groups and the realized benefits on successful implementation, have been listed out below.

1 – A VECP FOR OPTIMIZING COST

REDESIGN OF PEDESTAL FAN STAND ASSEMBLY

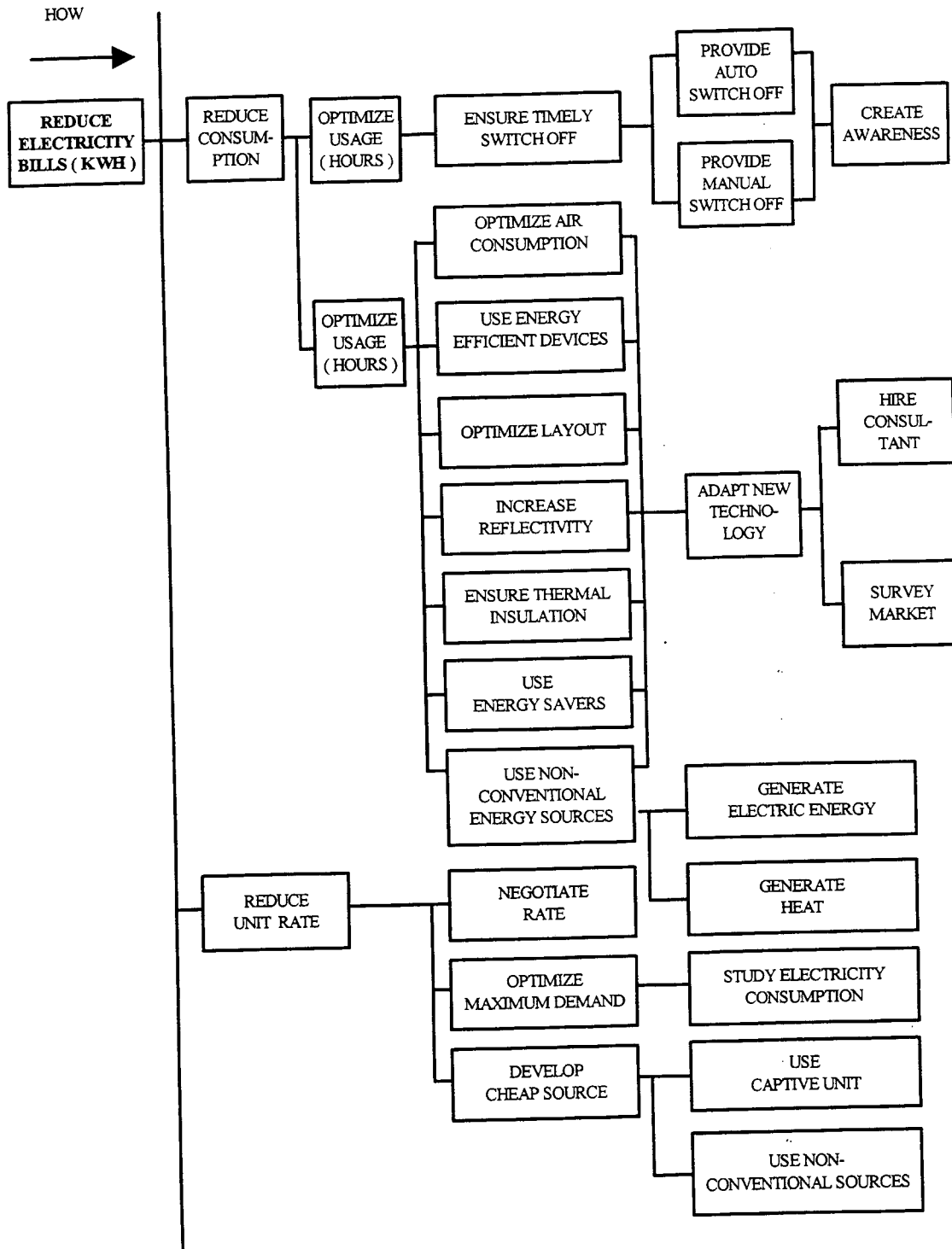
- Pressure die cast switch box, in place of gravity diecast
- Reduction in Aluminium content by 25 %
- Reduction in cast iron content in base by 25 %
- Simplified assembly & servicing
- Simplified packaging
- SAVINGS : Rs. 15 Lacs / year

2 – VECP FOR VALUE ADDITION

4 BLADE 600 MM CEILING FAN

- Number of blades increased from 3 to 4
- 2 colour combination , in very high gloss paint
- Customer complaints of electric hum eliminated
- SAVINGS : Rs.5 Lacs / year

FIG. 5 TASK FAST DIAGRAM FOR PLH SAVING



—(FIG - 5 continued)

FIG. 5 - TASK FAST DIAGRAM FOR PLH SAVING

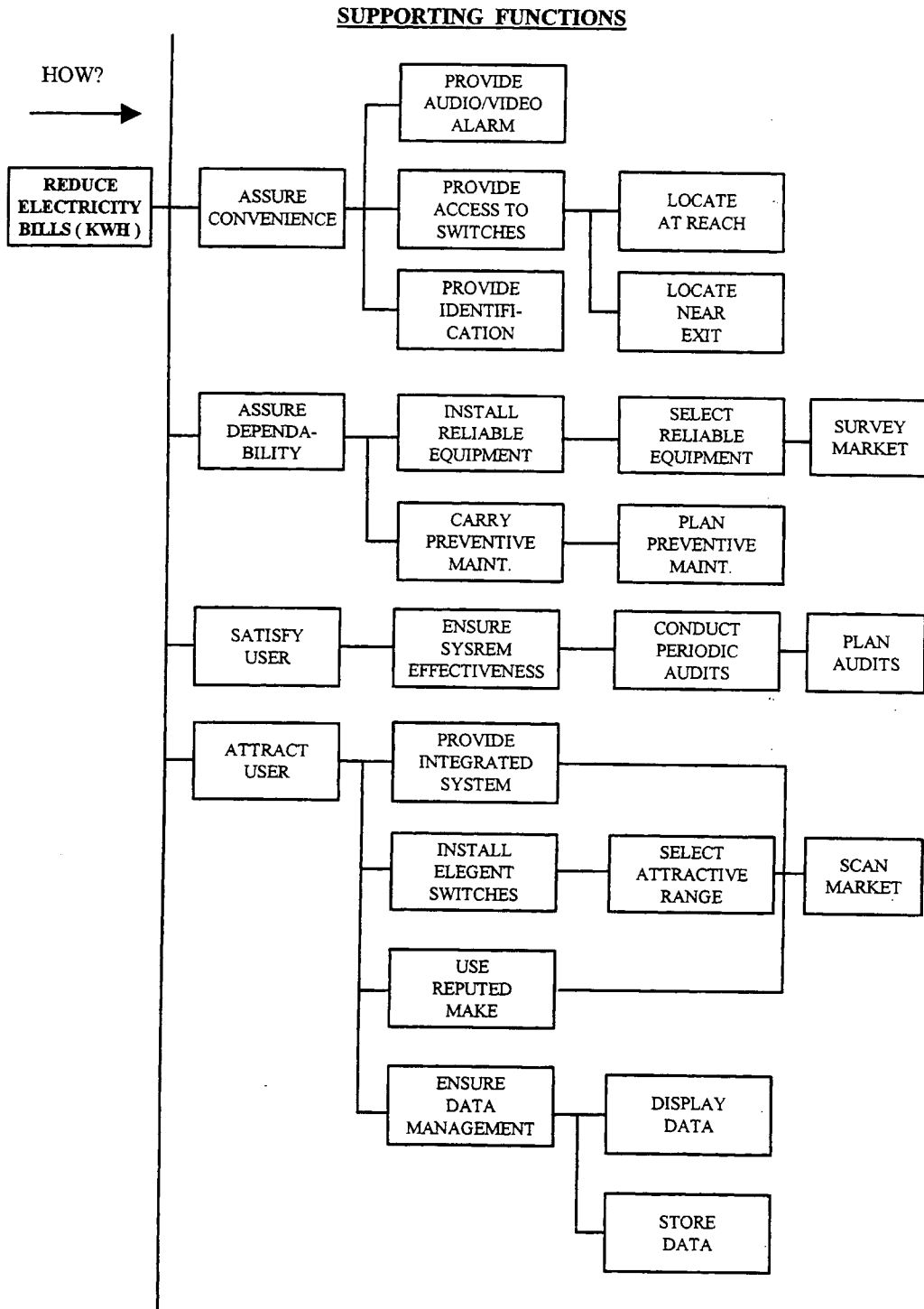


FIG. - 6 TECHNICAL FAST DIAGRAM FOR AFTER SALES SERVICE FUNCTION

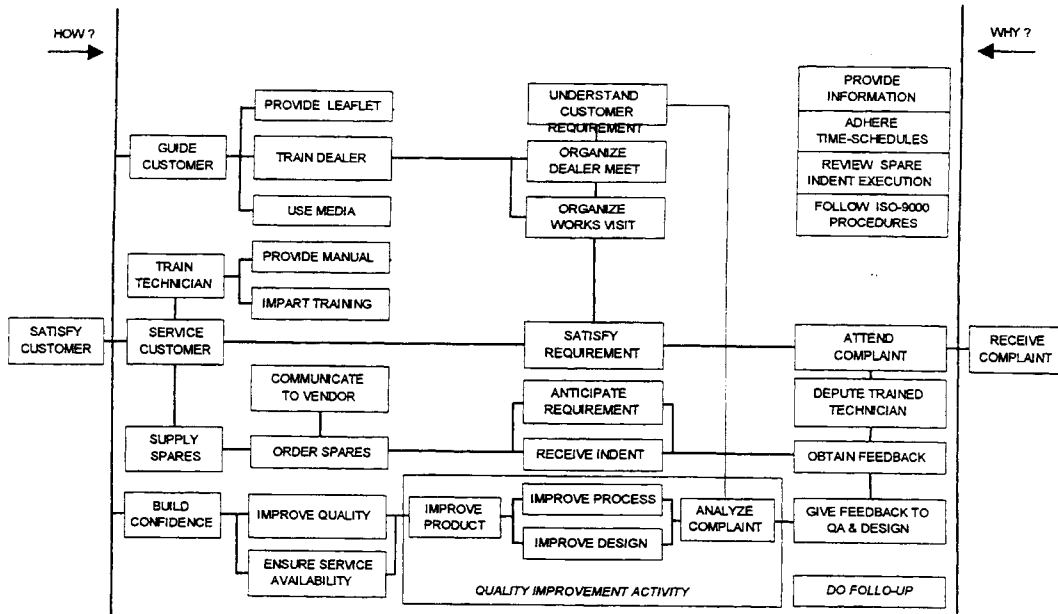
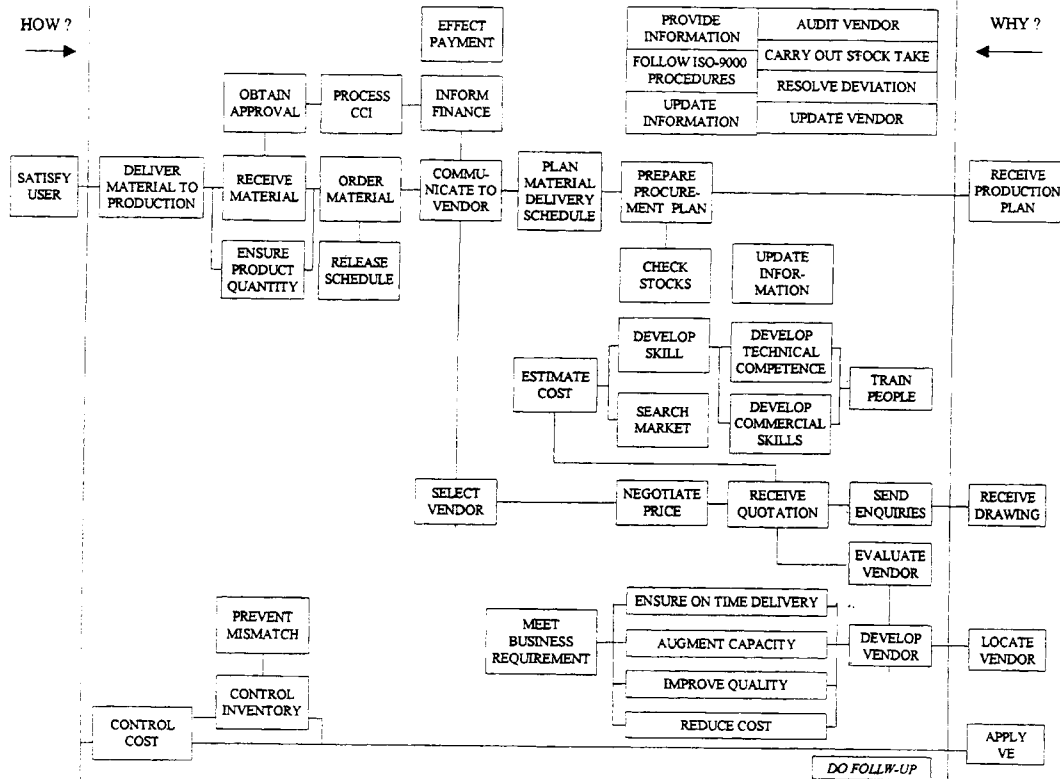


FIG. - 7 TECHNICAL FAST DIAGRAM FOR MATERIALS DEPARTMENT



3 – VECP FOR NEW PRODUCT DEVELOPMENT

SUNFLOWER TABLE FAN

A unique concept ,based on nature theme (sunflower, sun, birds etc.) first time in international market

- Complementary theme on packaging
- Number of blades increased from 3 to 6
- Cost increase by 1 %
- Increase in market realization by 15 %

4 – VECP FOR REDUCING PROCESS COST

REDUCE PROCESS COST OF TOP END-SHIELD MACHINING

- Power transmission mechanism of special purpose machine, replaced by simple one
- Machine modified to reduce power consumption
- Unwanted parts leading to frequent breakdowns eliminated
- Simplified long life tooling fitted
- Coolant pump eliminated
- Tool regrinding time and frequency reduced by 75 %
- Tool setting time reduced by 75 %
- Machine capability increased from 0.5 to 2
- Investment for new machine averted to the extent of Rs. 90 Lacs
- SAVINGS : Rs. 10 Lacs / year

5 – VECP FOR CAPITAL EXPENSES

PROCUREMENT OF FORKLIFTS

- VE study identified the correct requirements & hidden problems
- Led to selection of an Electric Forklift
- Precaution taken during evaluation phase to avoid recurrent breakdowns & battery damage
- Wrong decision avoided

- Investment saved by 30 %

6 – VECP FOR FACILITY

VE STUDY FOR AN OFFICE LAYOUT

- Functional requirements clearly identified
- Various supporting functions incorporated during office construction

7 – VECP FOR SYSTEMS & PROCEDURES

VE APPLIED TO OCTROI REFUND

- Key points identified through FAST Diagram
- System streamlined to speed up recovery of refund claims and avoid losses due to operational lapses or laxity.

SUMMARY AND CONCLUSION

VE may not be a panacea, for all the ills of an industry. But it will certainly show the direction, if properly applied. Certain essential elements must exist, if VE program has to succeed. The success of VE methodology, as practiced in Fan Division of Crompton Greaves, can be attributed to the following:

- i) Continued management support & encouragement
- ii) Resourcefulness of Coordinator
- iii) Focussed attention on VE program
- iv) Thrust on development of people
- v) Training in VE techniques.
- vi) Selection of projects with respect to business needs
- vii) Create awareness and interest in the minds of people.
- viii) Continuous guidance, giving the necessary push, where tempo slackened.
- ix) Regular review and monitoring