

**Dept. of ME, PVPSIT**  
**VALUE ENGINEERING (20ME2601A)**  
**UNIT-IV**

**Versatility of value engineering:**

**Value Engineering Operation in Maintenance and Repair Activities:**

- VE is a rigorous, systematic effort to improve the value and optimize the life cycle cost of a facility.
- Based on Value Engineering factor comparison study technique, required maintenance practice can be selected.
- The VE study is very helpful for new industry or small-scale industry for selecting the best maintenance practice for economic point of view
- It is new concept for selection of maintenance practice and enhance the moral of employee for taking a strong decision.
- The time consumption for taking a decision is less in this VE concept compared to other techniques.
- The following parameters have been selected for value Engineering study in maintenance and repair activities:
  - ✓ Cost (A)
  - ✓ Safety (B)
  - ✓ MTTR (C)
  - ✓ Quality(D)
  - ✓ Severity factor (E)

**Cost:** According to cost, less cost of maintenance has more value than high cost of maintenance.

value engineering in non-hardware projects- Accounting,

Maintenance and Logistics,

**Initiating a value engineering programme:**

Introduction:

1. Organization willing to implement Value Engineering (abbreviated as VE )program needs to impart necessary training to the employees regarding implementation VE program.
2. A training of appropriate level for almost each employee is necessary to make them acquainted about their responsibilities for the success of the VE program.
3. Though VE concept can be understood easily but very few personnel are aware of VE concept and its benefit to the organization.
4. Consequently, it is desirable that an organization planning to implement VE job plan must undertake a planned program of VE training, in order to achieve sufficiently skilled manpower to successfully implement a VE job plan.
5. Main objective of VE program is to convey to the personnel, the successful method of implementing VE program in the organization and to improve Value Management skills of the personnel.
6. The VE training program focuses on classical VE techniques with emphasis on successful techniques for a specific application.
7. Importance of creativity, innovation and team work is emphasized throughout the training program.
8. VE training program helps to develop the technical and analytical skills of the employees.
9. Thus, a good VE training program serves the interest of both management and the employees.
10. The VE training program is not same for each employer of the organization, hence different level of VE training is imparted to each employee, depending upon the expected degree of involvement of the employee in the implementation of VE job plan

**IMPLEMENTATION OF VE TRAINING PROGRAM**

A systematic implementation of VE training program requires three attributes given below:

- 1) Training coordinator
- 2) Training plan

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3) Training capability.

- Training coordinator: A senior officer in the organization is formally appointed as a VE training coordinator who is responsible for coordinating VE training throughout the entire organization.
- A central coordination system helps and any conflict, duplication, ambiguity and dilution in the VE efforts.
- The major role of VE training coordinator is as follows:
  - ✓ To initiate appointment of one personnel from each department like design, manufacturing, quality control, purchase, marketing who will be inducted as a VE team member.
  - ✓ To group personnel of each department based on category to be imparted to them.

(2) Training plan:

- A training plan is prepared for each group of training personnel which is decided by the training coordinator.
- A training plan usually includes:
  - i. A schedule for training for each category which indicates the number of days and hours per day of training.
  - ii. The schedule also indicates the topics to be covered during the training program and the venue for training program
  - iii. A procedure to assess the effectiveness of the training
  - iv. A method for developing in-house training capabilities (If they do not exist and if felt necessary by the organization)

(3) Training capability:

- The training imparted to the personnel can be provided in following ways:
  - ❖ By in-house officers
  - ❖ By in-house officers along with visiting faculty
  - ❖ By professional bodies consultants

i) Training by in-house officers:

- In large organizations usually there exist a HR (Human Resource) Training department which are involved in training of employees in the skills needed by the organization.
- The officers of HR department along with the heads of other department having knowledge about VE may impart the training to various groups.

(ii) Training by in-house officers along with visiting faculty:

- In certain cases organization may feel it important to invite experts from professional bodies or academic institutes or individual consultant to deliver lectures, to add to the training being imparted by the in-house officers.
- This helps to bring new ideas from outside the organization.

(iii) Training by professional bodies/consultants:

- The organization may engage professional bodies or consultant or academic institute to implement complete training program for each cadre of personnel in the organization.
- Where no VE training capability exists, an in-house training capability may be achieved by obtaining initial VE training outside the organization.
- Some of the professional agencies imparting professional VE training are Indian Value Engineering Society (INVEST), SSA training solutions, SAVE International etc.
- Upon completion of this outside training a VE training plan can be formulated which satisfy the specific needs of the organization.
- The next step is to schedule the first in-house workshop utilizing the services of one or more of the sources listed above.
- For subsequent training of other personnel large organization gradually develop a complete in-house VE training capability.

**CATEGORIES OF TRAINING**

There are mainly following six categories of VE training:

- i. Limited training (Level I)
- ii. Intensive training (Level II)
- iii. On the job training

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- iv. Training by rotational job assignment
- v. Contractual training
- vi. Informal training

- The first two types of VE training are implemented by professional organizations, while remaining four types of training programs organized and coordinated by in-house training/ HR department of the organization itself.
- It is not necessary for any organization to implement all its categories of VE training program for all the employees, rather depending upon the size and scope VE Job plan/ project the employees are grouped into two or three groups and each group is imparted different category of training.

**(1) Limited training (Level 1):**

- Limited training is necessary for all the employees of the organization willing to implement VE job plan
- This training provides a basic foundation of the concepts of VE.
- It is presented as mixture of lectures and application portion in the form of a workshop where live cases are discussed.
- The duration of the limited training program is around 30-40 hours.
- The training program is tailored, based on the specific requirements of the organization, but usually following topics are covered during the lecture.:
  - ✓ Objective of VE program
  - ✓ Expected outcome of VE
  - ✓ Concept of VE program
  - ✓ Terminology related to VE
  - ✓ Principal VE methods
  - ✓ Criteria for applying VE
  - ✓ Organization and operation of VE (VE job plan)
  - ✓ Contractual aspects of VE (Introduction)
  - ✓ Case studies
  - ✓ Receive Level 1 certificate from certification authority like SAVE

**(2) Intensive training (Level II):**

- Intensive training is meant for those employees/personnel who are expected to play the key role in the implementation of VE job plan.
- Usually five-seven member team is appointed as VE team.
- One each from design, manufacturing, finance, marketing, purchase etc.
- This team shoulders the responsibility of the success of VE program and hence are eligible for undergoing intensive training.
- The duration of intensive training program is around 30-40 hours.
- Limited training (Level 1) is considered as prerequisite for attending Intensive training.
- The training program is designed to provide advanced knowledge about VE concepts and its implementation.
- The program broadens and reinforces understanding of each participant regarding VE job plan.

The following topics are discussed and explained with suitable illustration and case studies

- ✓ Objectives of VE program
- ✓ Method of implementation of VE program
- ✓ Function analysis (Primary and secondary)
- ✓ Preparation of FAST diagram
- ✓ Evaluation of cost
- ✓ Evaluation of worth
- ✓ Estimation of Life Cycle Cost
- ✓ Methods of creativity
- ✓ Phases of VE job plan (Orientation, information, function, creation, evaluation, investigation, recommendation and implementation)
- The intensive training program is usually organized by professional bodies or consultants or academic institute who have wide experience in implementation of VE program. VE training

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program is organized in the form of workshop/seminar

**3) On the job training:**

- This is a less formal learning where the individual employee is guided by the value analyst during the office hours only.
- On-the-job training is arranged and coordinated by big organizations which have well established setup to impart training and well qualified trainers for the purpose of training.
- This is the most practical way of practicing and learning VE methods to work.
- They apply the methodology under the guidance of qualified value specialists (trainer) and are given the opportunity to learn how to apply basic skills to specific and productive work assignments.
- In this way, the trainee can be productive while in a training status.
- The employees identified for the training are required to meet the trainer periodically and produce a periodic report of what they have been doing.

**(4) Training by rotational job assignment:**

- Such assignments are frequently used in conjunction with on-the-job training.
- This is a kind of individual training where there is no formal teaching-learning in class rooms.
- The "trainee" value specialist is deputed to various departments of the organization for limited period of time.
- These departments may include manufacturing estimating, methods engineering, design engineering, etc.
- Exposure to other organization departments broadens the individual's perspective and leads improved understanding of the complex nature of product value.
- As a corollary to this, many companies schedule each of their management trainees for an assignment to the VE staff.
- These assignments tend to increase the level of understanding between the VE staff and middle management.

**5) Contractual training:**

- Certain aspects of VE in the defence environment of certain countries require specialized knowledge of contract management and administration
- Training programs to educate personnel in these areas are also necessary.
- In some of the countries Government encourages industry to challenge unrealistic Government requirements and specifications to increase profit by submitting Value Engineering Change Proposal (VECP) under VE contract clauses.
- These clauses are unlike other contract incentives that reward efficient performance according to the stated terms of the contract.
- VE contract clauses reward the contractor who proposes acceptable changes to the contract that will result in equal or better but lower-cost defence products.
- These changes are mutually advantageous to the Government and the contractor because both share the resultant savings.
- These are known as DoD (Department of Defence) VE contract clauses and these clauses encourage entrepreneurship by rewarding contractors equitably for their initiative in developing VECPS.
- The need for training those personnel responsible for the administration of these incentives was recognized.
- A number of courses both within and outside the Government are now offered to explain the concept and operation of the VE clauses of DoD (Department of Defence)

**6) Informal training:**

- Some organizations choose to train personnel for VE through less formal methods than those previously discussed, or to supplement formal training programs with informal training devices.
- Some of these informal training approaches are:
  - (i) Handbooks and manuals are a means of bringing about a climate of cost awareness throughout the organization.

The manual can be used to demonstrate how to perform VE while the handbooks provide cost data relating to trade-off possibilities, process information, etc.

- (ii) Bulletins and newsletters, distributed periodically, containing a section devoted to VE methodology.

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They act as continuing reminders to employees about the need for better value.

(iii) Technical meetings at which VE films or speakers from other facilities are presented.

(iv) Displays of successful VE case histories may be placed on bulletin boards and other locations throughout the organization.

Some organizations have extensive displays in lobbies, visitor and personnel reception rooms, etc.

#### **CAREER DEVELOPMENT FOR VALUE ENGINEERING SPECIALTIES**

- An engineer can develop a career as VE specialist and can pursue contractual work large, medium and small-scale organization.
- In some countries, Department Defence has an annual honorary awards program for VE.
- The awards program is intended to acknowledge those individuals, program managers, organizations, contractors and VE specialists, whose VE efforts were exemplary and resulted in substantial savings benefits during a particular fiscal year.
- A typical Value specialist has a degree in a related discipline or the equivalent years of experience.
- For those, who are to be trained as fulltime VE specialist, it is reasonable to require related academic training, in order to enter the field and be able to develop at a reasonable pace.