

## Chapter 4 VALUE ENGINEERING PROGRAM

### 4-1. Purpose.

This chapter provides guidance, establishes policies, and assigns responsibilities for planning, staffing, funding, implementing, directing, accelerating, and maintaining an effective Department of the Army Value Engineering (VE) Program.

### 4-2. Scope.

The VE Program applies to the Chief of Engineers, US Army Ballistic Missile Defense Program Office, US Army Materiel Development and Readiness Command, US Army Security Agency, and US Army Communications Command. It also applies to other MACOMs/agencies when they determine that implementing a VE program will produce economic benefits.

### 4-3. Definitions.

VE terms are explained in appendix B.

### 4-4. General.

The purpose of VE is to direct an organized effort to analyze the functions of Army systems, operations, maintenance, equipment, facilities, procedures, methods, and supplies to insure that these functions are achieved at the lowest total cost of effective development, production, maintenance, and/or ownership consistent with requirements for performance, reliability, quality, maintainability, and safety.

### 4-5. Policy

*a.* Army organizations/activities will apply VE in-house to improve military worth or reduce costs, wherever it is advantageous. VE will be used to eliminate unnecessary costs in all phases of the life cycle of Army materiel. HQDA will assign VE goals to appropriate MACOMs/agencies. These goals will be suballocated to functional and project managers and technical decision points will be established as necessary for the objective and prompt technical evaluation and processing of VE Proposals (VEP) and VE Change Proposals (VECP). Results achieved will be documented at the originating level of the VE action and reported.

*b.* Funds will be identified and allocated to pay for VEPs, VECPs, testing, and other costs arising from VE.

*c.* VE provisions will be included in all contracts for supplies, services, facilities, and materiel as provided in Section I, Part 17, of the Armed Services Procurement Regulation (ASPR). To maximize the benefits from VEPs and VECPs, the objective evaluation and processing of-

(1) VEPs and VECPs affecting configuration identification documentation will be expedited in accordance with AR 70-37, Configuration Management.

(2) VEPs and VECPs not affecting configuration identification documentation will be expedited in accordance with MACOM/agency requirements. In either instance, the originator of a proposal will be notified within 45 days of the proposal receipt date whether it has been accepted or rejected, or will be furnished a decision target date when additional time is required to fully evaluate the proposal. When a VEP or VECP involves a Federal or military specification, and the action to change the specification cannot otherwise be accomplished, MACOMs and activities will notify the specifications preparing activity by use of DD Form 1426, as outlined in DOD Manual 4120.3-M.

*d.* A centralized identifiable VE management capability will be established in those MACOMs/agencies identified in paragraphs 4-2 and 4-7c. To maintain a VE capability, staffing guidance is provided for MACOMs and agencies responsible for implementing the principles and applications of VE in accordance with the objectives and policies contained in this regulation. Normally, this function requires one full-time VE action officer for each 500 personnel up to 2000 and one additional VE action officer for each 1000 thereafter.

*e.* VE will be given full recognition, primary emphasis, and support by commanders, technical directors, program and project/product managers, and chiefs of operating agencies having responsibility for research, development, test, and evaluation, procurement, production, product assurance, operations and services, maintenance, supply, transportation, construction, storage, and final disposition of Army materiel and facilities.

*f.* Successful development and processing of VE actions will require the coordinated action of functional and project/product management organizations.

*g.* Military and civilian personnel performing in VE will receive formal training in the principles and applications of VE.

*h.* Materiel and items of equipment in logistics support status will undergo VE review on a selective basis, based on a high rate of return potential. When redesign of an end item or component is initiated, VE techniques will be used in



preparing the redesign. VE considerations will be integrated with product improvement proposals submitted to HQDA for approval (AR 70-15).

*i.* A plan to conduct VE on a systematic basis for each RDTE project will be established and included in Section III, Plans for System Development of the Development Plan (AR 70-27). The plan will form an integral part of Section III, Technical Development Plans, and will include a time-phased schedule to conduct VE during the development phase.

*j.* VE principles and methodology will be used throughout the conceptual, validation, development, production, and deployment phases, including operations, maintenance, and rebuild of the materiel life cycle to promote the fielding of equipment with optimum life cycle cost effectiveness.

*k.* Approved VE changes will be included in the technical data package of the item/system and used with future contracts and other materiel to which such changes may apply. Approved VE changes to items/systems subsequent to type classification will be reflected in the technical procurement data to be used for future procurement of those or like items/systems. Such VE changes will be screened to determine whether type reclassification is required under the provisions of AR 71-6. When VE changes are not approved, the VE files will be documented to indicate that consideration was given to the proposed design change and the reasons why the design improvements could not be used.

*l.* Maximum use will be made of VE task teams, representing required functional disciplines, when in-house VE studies are performed. Other organizations will provide their specialized capabilities as necessary to the VE process. The centralized VE organization will assist functional and project/product management organizations in performing VE to reduce cost of materiel, functions, operations, maintenance, and services.

*m.* A study/project may only be reported as an in-house VE study if it was identified to or by a designated higher management level in writing as a VE project prior to presentation of specific proposals for decision, and the project was accomplished or assisted by personnel qualified by VE training, or if written evidence of application of VE discipline is available (i.e., functional analysis, evaluation of worth, cost comparisons, etc.). Internal VE proposals must be the result of VE studies.

*n.* Reported VE savings actions will be validated to attest to the accuracy, authenticity, and acceptability of each reported savings including a budget officer's verification of the accuracy of the computation used to develop the savings and the planned utilization of the savings and its impact on the budget.

#### **4-6. Objectives.**

The objectives of VE are to—

*a.* Reduce the overall cost of Army operations, supplies, and services by—

- (1) Eliminating or modifying unessential characteristics and functions.
- (2) Extending financial, manpower, and materiel resources.
- (3) Fostering timely adoption of economically advantageous technical changes.

(4) Simplifying Army materiel with consequent general improvements in operational availability and logistic support.

(5) Instilling cost consciousness in Army personnel.

*b.* Obtain total value improvement in research, development, procurement, product assurance, construction, operations, maintenance, and production.

#### **4-7. Responsibilities.**

*a.* The Comptroller of the Army (COA) will—

(1) Be responsible for Army-wide management of the Department of the Army VE Program; formulate, establish, and maintain Army policy on VE.

(2) Furnish budget guidance to MACOMs/ agencies to assure that the VE Program is funded at a level which will realize its optimum potential. Develop and provide for funding of VE expenses when the time period or fiscal account in which savings accrue will not coincide with the time period or fiscal account in which the cost of the Army investment of share payments to a contractor occur.

(3) Designate a full-time VE Program Manager to develop and manage the Army's VE Program and serve as Army point of contact on VE matters with Office of the Secretary of Defense, other DOD components, other Government agencies, industrial associations, and professional and technical societies.

(4) Provide a DA representative to the DOD VE Committee.

(5) Establish and maintain an active and aggressive in-house and contractual VE Program, and assign such resources to the program as may be necessary to achieve its goals and objectives.

(6) Plan, program, direct, and coordinate the use of VE in research, development, procurement, product assurance, design/construction, operations, maintenance, and production.

(7) Establish Army VE goals, measure progress against these goals, and evaluate the effectiveness of the VE Program.

(8) Promote and maintain a high level of professional VE competence within the Army. Assure that key personnel



receive training consistent with their responsibilities and career programs. Assure that adequate VE training programs are established and are current.

(9) Assure that contractor VECPs are objectively and expeditiously evaluated and that contract modifications implementing approved VECPs are accomplished expeditiously.

(10) Review Army-wide VE personnel resources of MACOMs/agencies and take action to assure that adequate resources are available to support an effective VE Program.

b. The Deputy Chief of Staff for Research, Development, and Acquisition will—

(1) Designate an R&D VE coordinator to act as point of contact on VE R&D matters.

(2) Provide management emphasis to insure the application of VE to assist in meeting design-to-unit production cost (DTUPC) targets.

c. The Chief of Engineers, the US Army Ballistic Missile Defense Program Office, and Commanders of US Army Materiel Development and Readiness Command, US Army Security Agency, and US Army Communications Command will—

(1) Establish and maintain an active and aggressive VE Program, including an in-house and contractual VE effort, and assign such resources to the program as may be necessary to achieve assigned goals and objectives.

(2) Designate a qualified individual to be the VE Program Manager (VEPM). VEPM positions at MACOMs will be full-time assignments. The VEPM will be delegated authority to conduct an effective VE Program and will be supported by an identifiable VE organization with resources and staffing to effectively carry out responsibilities hereinafter enumerated.

(3) Assure that in-house VE studies are identified and conducted in a timely fashion on systems, equipment, facilities, procedures, and supplies throughout their life cycles if they have significant potential for reducing costs and increasing military worth.

(4) Establish a capability and conduct VE "mixed skill" task team studies within Army and contractor organizations to reduce high cost areas or which are over design-to-cost targets.

(5) Integrate the use of VE principles in RDTE projects.

(6) Insure that VE assists in establishing DTUPC targets and in tracking and achieving them from R&D through initial production of the mission systems/items.

(7) Integrate the use of VE principles during the design, construction, operation, and maintenance of Army facilities.

(8) Integrate the use of VE principles during the operation and maintenance of Army equipment, systems, and procedures to the maximum degree possible as a responsibility of the operational commands.

(9) Identify high cost areas and assure that resources are made available to perform VE analysis to lower the costs.

(10) Monitor contractor VE Program requirement clause performance to insure contract compliance and determine progress of resultant savings versus program cost.

(11) Continually encourage contractors to submit technically sound VECPs. Responsibility for major portions of this VE effort shall be assigned to line and project managers, program directors, and contracting officers.

(12) Insure establishment of necessary controls to assure objective and expeditious processing of VECPs

(13) Insure that cognizant design and engineering support elements participate in the development and evaluation of in-house VE proposals.

(14) Allocate VE goals down to operating levels (project and line management organizations).

(15) Establish a means for cross-feeding those VEPs and VECPs, which have potential for application within their command. Forward those VEPs and VECPs to HQDA (DACA-MP) which have potential for application throughout the Army.

(16) Conduct periodic management reviews of VE activities in order to place increased emphasis and priority on in-house VEPs and contractor-originated VECPs, which have cost savings potential. This will include, as a minimum—

(a) In-house VE results.

(b) Results from use of VE contract provisions.

(c) Processing time for evaluation of and action on VEPs and VECPs which require Government approval.

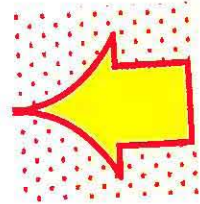
(d) The number and status of formal in-house VE projects at the operating level.

(e) Cross-feed of VEPs and VECPs to other Army activities.

(17) Insure that managers, architects, engineers, technicians, buyers, auditors; logisticians, contracting officers, and negotiators understand Army VE objectives, precepts, policies, goals, methods, contract incentives, and program clause provisions. VE courses listed in the Defense Management Education and Training Catalog, DOD 5010.16-C, or specialized VE courses will be utilized as appropriate for military and civilian personnel engaged in VE activities.

(18) Submit appropriate VE projects for referral through DA channels to the DOD Product Engineering Services Office (PESO) for study (app D).

(19) Sponsor projects to develop new and improved VE techniques and communicate such techniques to HQDA (DACA-MP) WASH DC 20310. Any such projects qualifying under the definition of research or technical development will be appropriately identified in the Army RDTE programs, as prescribed in AR 70-45.





- (20) Publicize benefits achieved through VE and recognize accomplishments by Army personnel performing VE.
- (21) Prepare semiannual statistical summary of VE actions in accordance with the provisions of paragraph 4-11.

#### **4-8. Precepts.**

a. Reductions in cost are frequently possible due to advances in technology, additional information from testing, user feedback, and changes in user requirements.

b. The VE discipline represents an intensified examination of that portion (generally 10-20 percent of a system, equipment, item, or procedure) which is highest in cost or lowest in military worth. It provides specific techniques (identification and analysis of functions, cost, targets, and cost visibility) to improve the economic efficiency of the engineering (or systems engineering) process. As such it can be used to assist in financial management of technical requirements.

c. The VE discipline can be applied profitably to systems, equipment, items, facilities, supplies, and procedures being designed, developed, procured, produced, operated, maintained, modified, and stored.

d. VE should be accomplished as early as possible (e.g., before design release) to maximize savings. However, later VE is precluded only in those rare instances where the cost of the VE effort and subsequent implementation would be greater than the savings potential. While later VE normally increases implementation costs and, may affect smaller quantities, such deterrents are frequently more than offset by advances in technology, additional available information, etc.

e. Special consideration and emphasis must be given during the operational cycle of equipments that were not specifically developed for a major purpose (i.e., commercial equipment procured with modification and/or changes to fulfill a DOD need). Very often the operation and maintenance of this type of equipment, over the life cycle, represents a far larger investment over the original equipment buy and/or installation costs. Under these conditions, the VE emphasis must be applied primarily to the operations and maintenance cycle to include procedures, processes, operational concepts, etc., as this (contrary to the emphasis in R&D and production of DOD development equipment as discussed above) represents a most fruitful area for savings in the described situation.

f. Since most of the design and manufacture of Defense materiel is accomplished by industry, use of VE contract provisions is necessary to supplement internal Army VE activity.

g. Proper application of the VE discipline and VE contract provisions can contribute to-

- (1) Making essential requirements economically feasible.
- (2) Avoiding cost growth.
- (3) Economically updating items in the inventory.
- (4) Simplifying Defense materiel, with attendant improvements in capability and readiness.

h. VE discipline and VE contract provisions provide individual architects, engineers, technicians, and managers with specific capabilities for fulfilling their responsibilities to meet performance and schedule requirements and minimum cost goals.

i. The VE discipline can be applied by the individual, team, or task force approach, depending on local operating circumstances.

j. VE benefits can be measured in both dollar and technical terms. Periodic management reporting of VE cost savings can provide an indicator of the relative cost consciousness of personnel and organizations. Technical benefits, such as improvements in reliability, maintainability, human factors, performance, and weights, may be identified separately, but are not generally quantified or reported in summary form.

#### **4-9. Budget guidance.**

In recognition of the overall cost benefits to be derived, it is the policy of the Army to include in all budget estimates and operating budgets such amounts as are necessary to pay for VEPs, VECPs, testing, and other costs arising from VE.

#### **4-10. Budget procedures.**

a. A formal budgeting schedule will be established whereby funding requirements for VE will be developed and submitted annually through the command VE program manager and comptroller, to justify fiscal year VE funding.

b. Where applicable, a deferred cost job order will be established in the 1900 series of a general ledger account as prescribed in AR 37-110. Deferred charges may be carried from one fiscal year to another on a specific study, but must be closed into an expense account at the determination of negative savings or the end of the second fiscal year, whichever comes first.

#### **4-11. Reporting requirements.**

a. MACOMs/agencies responsible for processing and evaluating contractor-originated VECPs and/or in-house VEPs will submit semi-annually to HQDA (DACA-MP) WASH DC 20310 a statistical summary of VE actions (RCS DD-I&L (SA&A) 1138) in the format shown in figure 4-1. Two copies of the semi-annual and annual report will be

forwarded to reach HQDA within 30 days after the end of the reporting period (i.e., 30 April and 30 October, annually).

b. Guidance for completing the VE Statistical Summary. See figure 4-1.

*Note.* All entries are cumulative from beginning of fiscal year to end of reporting period.

(1) *Item A.* Name of reporting MACOM/agency and the FY period covered in the report—

(2) *Item B.* Number of full-time VE personnel, excluding clerical or secretarial, on board at the end of the FY.

(3) *Item C.* Number of personnel trained during the reporting period.

(4) *Item D.* Prior to initiation of production includes any VE activity during concept, formulation, and design and development prior to initiation of pilot or full-scale production. After initiation of production, includes VE activity in operations, maintenance, or overhaul facilities.

(5) *Item D4.* Report the estimated gross dollar value of proposals accepted in D3. The estimated base should be one full year from the date of implementation of the proposal. Note that date of implementation may be later than the date of approval. Estimated savings from a proposal during development but implemented in production should be reported under "Prior to initiation of production." When reporting savings in this column, report estimated gross dollar value of proposals approved in D3 when savings can be estimated in a verifiable manner against some designated baseline. Otherwise report in D1, D2 and D3, but not D4.

(6) *Item D5.* Report only direct, nonrecurring investment costs to develop, test, and implement proposals approved in D3. Do not include administrative or overhead costs.

(7) *Item D6.* Compute return on investment by dividing D4 by D5.

(8) *Item E.* Report all VECs received under both Incentive clauses and Program Requirement clauses.

(9) *Item E3.* The sharing period will vary according to the length of contract and the nature of the VEC. A VEC for reduced data reporting in a development contract will provide a one-time savings on the current contract, since no savings will occur in future production. Sharing on other VECs, such as changes to hardware, will normally be 3 years, or the remainder of the contract, whichever is greater. Sharing on such VECs begins with acceptance of the first item incorporating the VEC. Include estimates of collateral savings, if any, for one full year.

(10) *Item E4.* Report direct government and contractor costs to develop, test, and implement proposals approved in E3.

(11) *Item E5.* Compute return on investment (divide E3 by E4).

(12) *Item F.* Report the number of VE Program requirement clauses placed on contracts during this reporting period.

(13) *Item G.* Report funds in dollars set aside this FY for VE investment. (No personnel or overhead costs. Include direct costs such as development, implementation, and testing for specific projects.)

(14) *Item H.* Identify all Army programs with estimated RDTE cost in excess of \$50 million or estimated production cost in excess of \$200 million that are in full-scale development or production. Report data required for each program.