

U.S. Department of Energy

Office of Management, Budget and Evaluation

Value Management



Initiated by: Office of Engineering and Construction Management

VALUE MANAGEMENT

Value Management (VM) is defined as “an organized effort directed at *independently* analyzing the functions of systems, equipment, facilities, services and supplies for the purpose of achieving the essential functions at the lowest life cycle cost consistent with the required performance, reliability, quality and safety.” Although there are numerous other published definitions of VM, most are merely minor variations of this definition. VM is the term used in this Practice and by the DOE in its contracts. Terms such as value analysis, value engineering, value control, and others are considered synonymous. Some use them to differentiate the use of the value process by those who are not engineers. Thus, value analysis is sometimes used to describe a value program in a purchasing or acquisition function. The terms value control or VM are used by some to describe the application of value techniques to administrative and office procedures. There may be some subtle differences among these terms but the basic objectives and philosophy appear to be the same for all. The DOE VM program encompasses all value-oriented activities.

VM utilizes the total resources available to an organization to achieve broad, top management objectives. VM is an integral part of the overall project delivery process and is not a separate entity designed to “second-guess” the integrated project team (IPT) or design authority. VM is seen as a systematic and creative approach for increasing the “return on investment” in components, systems, facilities, and other products acquired by the DOE. Increased return on investment for the DOE results from a combination of lower costs for the acquisition of systems, equipment, facilities, services, and supplies, while maintaining the required level of performance. This viewpoint is consistent with statements of policy and regulations governing VM in the Federal Government, and serves to further describe the role of VM in the DOE. For industry, the benefits of VM include an acceptable return on investment, increased profits, and improved competitive position. This chapter is intended to provide an understanding of the DOE VM program and objectives in order to encourage broad participation and to achieve maximum benefits from the application of VM principles and techniques.

1.0 FEDERAL LAWS, REGULATIONS, AND REQUIREMENTS— VALUE MANAGEMENT

1.1 Public Laws

The 1986 Water Resources Development Act (Public Law 99-662) requires a new cost-cutting review (the value methodology) on all federally funded water and wastewater-treatment projects with a total project cost in excess of \$10M. The bill reads:

PUBLIC LAW 99-662--NOV. 17, 1986

SEC. 911. During the design of each water resources project which has a total cost in excess of \$10,000,000, which is authorized before, on or after the date of enactment of this Act and undertaken by the Secretary, and on which construction has not been initiated as of the date of enactment of this Act, the Secretary shall require a review of the cost effectiveness of such design. The review shall employ cost control techniques which will ensure that such project is designed in the most cost-effective way for the life of the project.

Conference Report dated October 17, 1986, from the Water Resources Development Act of 1986, the following is excerpted: "Section 911 is adapted from both the Senate and House bills and will require a new cost-cutting review on all projects with a total cost in excess of \$10 million. Although not specified in the Conference Report, the type of study to be undertaken is commonly known as value engineering."

The 1995 National Highway System Designation Act requires states to carry out a VM analysis for all federal-aid highway projects with an estimated total project cost of \$25M or more.

On February 10, 1996, President Clinton signed the Defense Authorization Act, now known as Public Law 104-106, which contains a special section of procurement reform for the entire Executive Branch, not just Defense. The bill reads:

PUBLIC LAW 104-106--FEB. 10, 1996

SEC.4306. Value Engineering for Federal Agencies.

(a) Use of Value Engineering.--The Office of Federal Procurement Policy Act (41 U.S.C. 401 et seq), as amended by section 4203, is further amended by adding at the end the following new section:

SEC.36.VALUE ENGINEERING.

"(a) IN GENERAL. Each executive agency shall establish and maintain cost-effective value engineering procedures and processes."

"(b) DEFINITION. As used in this section, the term 'value engineering' means an analysis of the functions of a program, project, system, product, item of equipment, building, facility, service, or supply of an executive agency, performed by qualified agency or contractor personnel, directed at improving performance, reliability, quality, safety, and life cycle costs."

Some other notable general legislation relating to the agencies and VM is its stipulation that it can be used as a "performance parameter." Other laws related to VM are: "Budget Enforcement Act of 1990," "Omnibus Budget Reconciliation Act of 1993," "Government Performance and Results Act of 1993," and the "Federal Acquisition Act of 1994."

1.2 OMB Circular A-131

Office of Management and Budget (OMB) Circular A-131, “Value Engineering,” states that agencies use VM as a management tool, where appropriate, to ensure realistic budgets, identify and remove nonessential capital and operating costs, and improve and maintain optimum quality of program and acquisition functions.

OMB Circular A-131 establishes the minimum Federal agency responsibilities to ensure that systematic VM improvements are achieved. Federal agencies are to, at a minimum:

1. Designate a senior management official to monitor and coordinate agency VM efforts.
2. Develop criteria and guidelines for both in-house personnel and contractors to identify programs/projects with the most potential to yield savings from the application of VM techniques. The criteria and guidelines should recognize that the potential savings are greatest during the planning, design, and other early phases of project/program/system/product development. Agency guidelines will include:
 - Measuring the net life cycle cost savings from VM. The net life cycle cost savings from VM is determined by subtracting the Government’s cost of performing the VM function over the life of the program from the value of the total saving generated by the VM function.
 - Dollar amount thresholds for projects/programs requiring the application of VM. The minimum threshold for agency projects and programs which require the application of VM is \$1M. Lower thresholds may be established at agency discretion for projects having a major impact on agency operations.
 - Criteria for granting waivers to the requirement to conduct VM studies, in accordance with the Federal Acquisition Regulations (FAR) 48.201(a).
 - Guidance to ensure that the application of VM to construction projects/programs and other projects/programs, will include consideration of environmentally-sound and energy efficient considerations to arrive at environmentally-sound and energy efficient results.
 1. Assign responsibility to the senior management official to grant waivers of the requirement to conduct VM studies on certain programs and projects. This responsibility may be delegated to other appropriate officials.
 2. Provide training in VM techniques to agency staff responsible for coordinating and monitoring VM efforts, and for staff responsible for developing, reviewing, analyzing, and carrying out VM proposals, change proposals, and evaluations.
 3. Ensure that funds necessary for conducting agency VM efforts are included in annual budget requests to OMB.

4. Maintain files on projects/programs/systems/products that meet agency criteria for requiring the use of VM techniques. Documentation should include reasons for granting waivers of VM studies on projects/programs which met agency criteria. Reasons for not implementing recommendations made in VM proposals should also be documented.
 - a) Adhere to the acquisition requirements of the FAR, including the use of VM clauses set forth in Parts 48 and 52.
 - b) Develop annual plans for using VM in the agency. At a minimum, the plans should identify both the in-house and contractor projects, programs, systems, products, etc., to which VM techniques will be applied in the next fiscal year, and the estimated costs of these projects. These projects should be listed by category, as required in the agency's annual report to OMB. VM proposals and VM change proposals should be included under the appropriate category. Annual plans will be made available for OMB review upon request.
 - c) Report annually to OMB on VM activities.

1.3 Federal Acquisition Regulations

The FAR defines VM as the analysis of the functions of a program, project, system, product, item of equipment, building, facility, service, or supply to improve performance, reliability, quality, safety, and life cycle costs. It is the formal technique by which contractors may (1) be required to establish a program to identify and submit to the Government methods for performing more economically, or (2) voluntarily suggest methods for performing more economically, and share in any resulting savings. VM attempts to eliminate, without impairing essential functions or characteristics, anything that increases acquisition, operation, or support costs.

FAR Part 48 - Value Engineering. There are two VM approaches described in FAR Part 48, "mandatory program" and an "incentive," also known as voluntary. The two approaches are:

- In the mandatory program approach, the Government requires and pays for a specific VM effort. The contractor performs VM of the scope and level of effort required by the contract. The contractor shares in savings, but at a lower percentage than under the incentive approach.
- In the incentive approach, the contractor participates voluntarily and uses its resources to develop and submit VM change proposals. If the Government accepts a value engineering change proposal, the contractor shares in savings and receives payment for its allowable proposal costs.

FAR Part 48 also prescribes three clauses, 52.248-1, 52.248-2, and 52.248-3. These clauses apply to contracts in general, architect-engineer contracts, and construction contracts,

respectively. Procedures are slightly different and sharing of savings are more restricted for architect-engineer contracts and construction contracts. FAR 52.248-1 has three Alternates. Alternate I applies if the contracting officer chooses the mandatory program approach. Alternate II applies if the contracting officer chooses both the incentive approach and the mandatory program approach. Alternate III applies if collateral savings are not to be included.

1.4 Department of Energy

DOE Order 413.3 and DOE Manual 413.3-1, directs DOE to use VM to derive the lowest life cycle cost of a capital asset. The Order states that value engineering yields the greatest cost savings when applied to the planning and design phases of a project (*Mandatory Program*). It also states value engineering should be used during the construction phase of a project (*Voluntary or Incentive Program*).

- In the mandatory program approach, the DOE requires and pays for a specific VM effort. The contractor performs VM at the scope and level of effort required by the DOE. Primary emphasis is placed on obtaining maximum life cycle value for first-cost dollars expended within project budgets. Secondary emphasis is placed on first-cost reductions derived from the program. First-cost reductions achieved to bring a project within approved budget are not considered nor reported as “cost savings” but rather as a “cost avoidance”. First cost saving to be reported are only those dollars withdrawn from approved budgets and reallocated to other uses, all as a result of VM. Cost avoidance will be tracked using standard program/project baseline configuration management practices. Under the mandatory program, the contractor does not share in savings that are considered a cost avoidance. However, the contractor does share in cost savings that are withdrawn from approved budgets and reallocated to other uses, but at a lower percentage than under the incentive approach. VM is not to be applied as a simple cost cutting mechanism at the expense of required project functions or features.
- In the incentive approach, the contractor participates voluntarily and uses its resources to develop and submit VM change proposals. A VM change proposal is a contractual mechanism provided by FARs. It provides a financial incentive to get contractors and subcontractors to reduce the cost of systems, supplies, and services for contracts (fixed price sub-contracts, unit price contracts, etc.) in-progress. To qualify as a VM change proposal, a proposal, at a minimum, requires a change to a contract to implement, and save money. It should lower the overall cost without degrading performance, reliability, maintenance, or safety. In the Federal Government, a VM Incentive Clause is required in all contracts over \$100,000 and can be requested in smaller ones (usually all contracts over \$10,000). No obligation to accept a VM change proposal is present and the risk for the contractor’s development costs resides with the contractor. If the Government accepts a VM change proposal, the contractor shares in savings and receives payment for its allowable proposal costs.

2.0 DOE VALUE MANAGEMENT PROGRAM INTENT

The Secretary of Energy has placed increased emphasis on limiting the overall expenditures of the DOE to the minimum necessary to achieve the capability to fulfill its mission. VM has become recognized as an effective contributor to this objective. It is an intensive review of requirements and the development of alternatives by the use of appropriate value techniques utilizing aspects of engineering, requirements analysis, the behavioral sciences, creativity, economic analysis, and the scientific method. Employed in an organized effort, it utilizes a systematic procedure for analyzing requirements and translating these into the most economical means of providing essential functions without impairing essential performance, reliability, quality, maintainability, or safety. There is no limit to the field in which VM may be applied. Its application can be considered at any point in the life cycle of a product. Experience has shown that the beneficial impact of VM is not limited to economic improvement. Significant improvements also occur in other attributes that are not always readily measurable in monetary terms.

2.1 DOE VM Program Philosophy

The basic philosophy of the DOE VM program is to enhance the value received per dollar spent during the acquisition of capital assets.

- The VM program is an integral part of the overall project delivery process and is not a separate entity designed to “second-guess” the Integrated Project Team or design authority.
- The Department will utilize a two-tiered approach, as defined in the FAR, to implement a viable and cost effective VM program. The two VM approaches as described in FAR Part 48 are the “mandatory program” and the “incentive” (also known as voluntary) program.

2.2 DOE VM Program Objectives

The basic VM concept is that anything providing less than the performance required by the customer or user is not acceptable; anything providing more should be avoided unless there is no cost penalty.

The objective of VM at DOE is to reduce the Government’s acquisition or ownership costs (operational costs, maintenance costs, training costs, etc.) while maintaining the necessary level of performance. This objective may be achieved by encouraging contractors to respond to the VM clauses in DOE contracts. These clauses invite or require contractors to initiate, develop, and submit cost-reduction proposals during performance of a contract that involve changes to contract requirements. The clauses require the Government to share with the contractor any cost reduction resulting from a VM change proposal. VM clauses in DOE contracts are not enough. The clauses merely permit contractors to question the value of

government specifications, statements of work, and those requirements that contribute nothing (except cost) to the contract tasks or items being bought. The invitation is to be accepted by the Government. Then both parties (Government and contractor) are to work together to capture the actual benefits.

The approach to implement VM across the DOE consists of the following key objectives:

- To help DOE live up to its responsibility to deliver capital assets on schedule, within budget, and fully capable of meeting mission performance and environmental, safety, and health standards.
- To conform to Public Law 104-106, National Defense Authorization Act For Fiscal Year 1996 and OMB Circular A-131
- To not unduly impede the efficient and effective delivery of capital assets while meeting DOE objectives to obtain quality products, ensuring timeliness of performance, controlling costs, and mitigating adverse events.

2.3 Roles and Responsibilities

In DOE, the Office of Engineering and Construction Management, within the Office of Management, Budget and Evaluation, is responsible for establishing the Department's VM policy.

Implementation and execution of the VM policy, by establishing a VM program, is the responsibility of the Department's Under Secretaries. A typical VM program includes a defined set of policies and responsibilities to ensure that the VM discipline is integrated into all elements of an organization.

An effective and sustained VM program will have:

- Top management involvement to ensure implementation and continuing emphasis by middle management.
- A key individual to manage the VM program. This individual should be well versed in VM principles, techniques, and appropriate acquisition regulations.
- A "master plan" to insure that actions which may effectively contribute to a successful program are considered and acted upon.
- VM objectives, policies, responsibilities, and reporting requirements firmly established and implemented.
- The funds necessary for administrative and operating expenses such as testing and evaluating proposals.
- A comprehensive training and orientation program, to acquaint personnel with policies, procedures, and benefits.

- “Cross-feed” mechanisms to communicate information about successful application to others who can benefit.
- Close coordination with contract administration and marketing to ensure proper VM contractual participation and marketing follow-up.

A successful VM program requires top management involvement. Each functional, project or acquisition manager is to cooperate and participate to ensure an effective program. Line management is both responsible for and benefits from VM.

2.4 DOE Value Management Program Requirements

OMB allows Federal Departments and Agencies to apply VM where the organization feels it is most appropriate. The minimum requirements for VM application, consistent with the two VM approaches described in FAR Part 48, for the Department is:

- A formal mandatory VM program will be required for all facility construction activities having a total project cost greater than \$5M. For maximum benefit, VM should be employed as early as possible in the project development/design process so valid VM recommendations can be implemented without delaying the progress of the project or causing significant rework of completed designs. All mandatory VM studies will be accomplished prior to Critical Decision-2.
- A VM Incentive Program (as prescribed by the FAR) is to be required in all contracts that are awarded on facility construction projects having a TPC greater than \$5M, that are awarded after Critical Decision-3, where the following contract conditions exist:
 - DOE or its agents have dictated the specification, design, process, etc., that the contractor is to follow.
 - The contractor’s cost reduction effort is not covered under award fee (or any other incentive).
 - The Contracting Officer has confidence in the cost estimate for the work at issue. That is, confidence that the cost estimate is close to normal FAR pricing conditions.
 - The contracting officer has great confidence that the contractor’s accounting system can separately track costs of VM efforts based upon the contractor’s assertions and confirmation from the DOE cognizant contracting officer’s office. That is, confidence that the contractor accounting system is comparable to normal FAR pricing conditions.
 - The proposal, if accepted, requires a change to the contract and results in overall savings to DOE after implementation.

Additionally, it is the responsibility of the Department's Under Secretaries and their respective organizations to develop criteria and guidelines that conform to Public Law 104-106, National Defense Authorization Act For Fiscal Year 1996, and OMB Circular A-131. This applies for both in-house personnel and contractors that identify programs/projects with the most potential to yield savings from the application of VM techniques.

3.0 VALUE MANAGEMENT PRINCIPLES AND PRACTICES

3.1 Value Management – A Valuable Component of Successful Program/Project Management Activities

In general, all organizations and people want to do a good job. They want to meet the needs of their customers. When an organization or person consistently fails to meet the needs of the customers well, they eventually fail: few plan to fail. Unfortunately, the best direction is not always clear. The limitations of time, money, expertise, and other resources require shortcuts or decisions that may not be based as well as they should be.

When people decide they want to do something optimally, the results are astonishing. To decide to do something better is the first step. To use good techniques to do it is the second step. The third step is acquiring those skills. As people acquire those skills, they and their employer benefit. Whether applied by the individual, Integrated Project Team, or organization, VM is one of those skills that produces great benefits without having to endure hard lessons through the “school of hard knocks.”

The VM program at DOE is an integral part of the overall project delivery process; it is not a separate entity designed to “second-guess” the Integrated Project Team or design authority.

Most engineers say they do VM. This is rarely correct. Often, the statement that they “do VM” stems from a misunderstanding between the concept of the designer putting value in their management, and the act of performing VM.

Engineers almost always consider value in their decision activities. Many engineers rightly feel that value is a part of the definition of the word, “engineering.” Indeed, Webster's dictionary defines it as: “The application of scientific and mathematical principles to practical ends such as the design, manufacture, and operation of efficient and economical structures, machines, processes, and systems.”

While performing VM produces results similar to the above definition, it is different. VM is a specific use of the Value Method process. To obtain an optimum solution, the designer can apply the Value Method several times throughout the project as a highly efficient decision-making process. An independent group can add expertise and a fresh perspective to both the decision-making and the customer requested end product result, by applying VM to further increase the final product value

Good design engineers have a discovery and decision process that they follow. Often, they have learned their individual process through the “school of hard knocks.” They use their decision process to obtain the product they understand is expected. Their process helps them find out: who is the client; who are the owners, users, and stakeholders; and what are the needs, wants, criteria, involved. Then, the engineer generates a design, using engineering principles, to obtain the apparent optimum product for the customer. Their decision process rarely, if ever, uses functions, function logic diagrams, or value-based comparative analysis methods. Occasionally, due to the failure to ask a question that no one dreamed would need to be asked, a key parameter affecting the customer’s satisfaction with the product is missed.

The Value Method is a series of procedures performed in a specified sequence. It is a part of a decision process that, for more than fifty years, has been optimized by many people and application experiences. It uses a function and logic approach that inspires people to ask all the key questions. This strongly reduces the potential that a key need or issue will be missed. The use of a value-based decision-making approach helps assure that resources (e.g., time, money, and expertise) are directed toward the solutions that have the highest potential for meeting customer needs at optimum cost. Further, the Method attempts to obtain the largest number of creative solutions to widen the potential for better value. When the process is complete, a design that obtains the apparent optimum product for the customer, using engineering principles and the results of the VM analyses, is generated.

These are some of the key features that differ between “putting value in your engineering” and “performing VM.”

The practices and processes associated with VM have proven to be among the most powerful available to the professional manager. VM is a best business practice; those projects that have used VM, especially early in the development process, have generally been greater accomplishments. Successful VM application is the result of project managers looking for opportunities to initiate VM Studies that are graded to meet the program or projects need.

3.2 Value Management “Is not....”

VM is not what good planners and designers do as a matter of routine and it is not part of the typical design development process. A VM analysis or VM Study is more rigorous than the typical project review. Each VM Study brings together an impartial and independent team of professionals with the common purpose of improving and optimizing the program or projects value. The format and structure of a Value Study serves to aid both the owner and designer with achieving their objectives. VM is seen as a systematic and creative approach for increasing the “return on investment” in components, systems, facilities, and other products acquired by the DOE. Increased “return on investment” for the DOE results from a combination of lower costs for the acquisition of systems, equipment, facilities, services, and supplies while maintaining the required level of performance. This viewpoint is

consistent with statements of policy and regulations governing VM in the Federal Government, and serves to further describe the role of VM in the DOE.

Similarly, a VM Study is not a traditional cost reduction approach. In a VM Study, cost reduction is achieved by improving a product without reducing essential performance, reliability, or maintainability. Conversely, traditional cost-reduction efforts concentrate on material substitutions, and reducing or eliminating specific elements. This approach frequently results in reduced quality, or diminished performance. That is not the goal or purpose of VM at the DOE.

A typical VM program consists of a defined set of policies and responsibilities which will ensure that VM discipline is integrated into all elements of an organization. An effective and sustained VM program will have:

- Top management involvement to ensure implementation and continuing emphasis by middle management
- A key individual to manage the VM program. This individual should be well versed in VM principles, techniques, and appropriate acquisition regulations
- A “master or strategic plan” to insure that actions which may effectively contribute to a successful program are considered and acted upon
- VM objectives, policies, responsibilities, and reporting requirements firmly established and implemented
- The funds necessary for administrative and operating expenses such as testing and evaluating proposals
- A comprehensive training and orientation program, to acquaint personnel with policies, procedures, and benefits
- “Crossfeed or Lessons-Learned” mechanisms to communicate information about successful application to others who can benefit

At the DOE, the following should also be included:

- Close coordination with contract administration to ensure proper VM contractual participation and adherence to FAR.

Although there are many other specific tasks required to ensure that VM achieves its full potential, the above form the foundation upon which the structure of a strong program may be built. As is the case for most successful programs, there are a few key elements required for an effective and economic VM Program.

Each Department Element should have a cost-effective management structure in place that provides the following:

- A single point-of-contract in each Department Element to oversee, coordinate, and assure completion of VM Program actions.
- A structure that encourages the appropriate application of the VM Methodology within DOE and its contractor and subcontractor organizations.
- Clear roles and responsibilities for all involved in the VM Program.
- Annual VM Program planning, monitoring and reporting. Including the systematic identification of Value Study projects, compiling and distributing VM Program Reports (OMB requirement), and capturing and disseminating successes and lessons learned.
- An available VM training program and a system for applying training to appropriate personnel.
- Adequate funding to support the items indicated above.

3.3 Value Management Criteria

If not used effectively, knowledge of VM techniques is of little value. Like any profitable program or business, the successful VM program is based on an adequate return on investment. Normally, a product line is selected on the basis of anticipated contribution to profit. Similarly the selection of VM projects should be based on the potential yield from the time, talent, and cost which will be invested. The selection procedure should rank possible projects in order of potential return and probability of implementation. This enables the manager to determine which projects are likely to be the best investment.

VM has been proved effective in environments such as the engineering laboratory, test facilities, procurement operations, construction projects, manufacturing facilities, and maintenance depots. It has been applied to a broad spectrum of items, procedures, systems, and equipment. The range continues to expand.

A VM program includes a planned and organized set of specific tasks that support (or apply the VM discipline to) all major cost elements of an organization. Well-defined procedures lead practitioners through the essential steps of the process, and the execution of these steps generally involves the participation and coordination of personnel with diverse backgrounds.

VM is directed toward analyzing the functions of an item. In this respect, it differs from most other cost reduction techniques. Some other techniques may reduce inherent quality by cheapening the product to reduce cost. The VM technique starts with a determination of the required function and then seeks lower cost alternatives to achieve that essential function. The objective is to identify and eliminate unnecessary cost without loss in needed quality or reliability.

Functional analysis develops a “statement of function” for each part or element of the item being analyzed. Such functions are classified as basic and secondary. A basic function is one

that cannot be eliminated without degrading the usefulness of the end item. A secondary function is not essential to operate the item in its intended application but is a consequence of the selected design solution. Limiting secondary functions and minimizing the cost of basic functions results in an item of “best value” which is consistent with all performance, reliability, quality, maintainability, logistics support, and safety requirements. The term “best value” refers to the best relationship between worth and cost. In other words, a “best value” stands for an item that reliably performs the required basic function at an appointed time and place with the lowest total cost.

3.4 Two Common Components for all Federal Value Management Programs

Within the Federal Government there are two terms used for the recommendations resulting from VM efforts. They are:

- *Value Management Proposal.* A VM recommendation originating and implemented solely within the Government which was originated by a contractor and may be implemented as a unilateral contractor action, or one which was originated by a contractor hired solely for the purpose of doing VM and implemented by the Government.
- *Value Management Change Proposal.* A formal recommendation by a contractor requiring Government approval and which will require a change to the contract, specifications, purchase description, or statement of work, and result in a decrease in the overall cost to the Government. VM change proposals may be submitted by contractors having a VM clause included in their contract in accordance with the applicable acquisition regulation. Subcontractors may also submit VM change proposals to prime contractors in accordance with the terms of their contract. The current acquisition regulation directs contractors to include VM provisions in subcontracts (with certain limited exceptions) of \$100,000 or more. Spares contracts and subcontracts of \$25,000 or more are to include a VM incentive clause.

3.5 DOE Value Management Contract Requirements

Specific VM contract provisions are contained in the FAR and the DEAR supplements. These publications specify DOE acquisition policies. Their provisions enable a contractor to recover a portion of the savings that result from initiative and ingenuity in identifying and successfully challenging nonessential contract terms and provisions. These clauses are intended to foster a climate of cooperation and managed change to permit the Government to acquire better, lower-cost items.

3.6 When is the Optimum Time to Perform Value Management?

The life cycle of a system or equipment begins with the determination that an operational deficiency exists or a new DOE capability is needed. Early VM tends to produce greater;

savings or “cost avoidance” for two reasons. First, more units are affected by the savings actions. Second, earlier changes lower implementation costs such as testing, modifications to production lines, retooling expenses, and changes to operational support elements (e.g., spares, manuals, maintenance facilities). VM should be accomplished as early as possible.

However, VM late in a program is precluded only in those rare instances where the cost of the VM effort and subsequent implementation would be greater than the potential savings. While later VM normally adds implementation costs and may affect smaller quantities, such deterrents can be more than offset by improved performance through advances in technology, additional available resources, more time, etc.

Opportunities for certain types of proposals are frequently enhanced later in the life cycle. For instance, deletion of quality assurance testing often cannot be proposed until considerable experience is acquired and data gathered to prove that it is not harmful. In another case, management reports required to understand the complex situation early in a project may turn out to be unnecessary during later phases of the project.

The VM opportunity may be extended because the product life and total requirements are not known. Many items of defense material will be re-procured indefinitely. There is no way to estimate the total quantity that will be purchased. Examples are: ongoing waste management activities, ongoing maintenance activities, infrastructure improvement efforts, etc. In the past, many items that entered the Department’s inventory were never value engineered. These items often benefit from a VM effort to the same extent as previously value-engineered products. The potential for VM savings on these items is great. Advances in technology or changes in user requirements provide a basis for potential savings greater than the cost of the study and subsequent implementation. Thus, VM may be applied at any point in the life cycle of an item or system where it is profitable to do so. Selection of the most appropriate time is influenced by many factors. Two of the most important are the magnitude of the savings likely from the effort and the ease or difficulty with which VM may be applied. VM in early stages is characterized by benefits that are difficult to measure. Often resulting “cost avoidances” are simply approximated. Later VM results in “before and after” examples whose cost savings may be forecast with greater accuracy.

3.7 Value Management Key Characteristics

Several characteristics differentiate VM from other techniques. These help ensure that the customer obtains the kind of product they need and want.

3.7.1 Value

Value is the relationship of worth to cost in accordance with the user’s (or customer’s) needs and resources in a given situation. The true value of a activity or product is its relationship to its perceived worth as opposed to its life cycle cost. In VM terms: $\text{Value} = \text{Worth} / \text{Cost}$.

When an item has a Value greater than 1.0, the item is perceived to be a fair or good value. When an item has a Value less than 1.0, the item is perceived to be a poor or bad value. Value may be increased by: (1) improving the utility of something with no change in cost, (2) retaining the same utility for less cost, or (3) combining improved utility with a decrease in cost. Optimum value is achieved when all utility criteria are met at the lowest overall cost. Although worth and cost can each be expressed in monetary units, value is a dimensionless expression of the relationship of these two.

3.7.2 Worth

The worth of a product involves many features. The most common cited are: benefits received, services obtained, satisfaction of the product performance, quality, safety, and convenience. The worth of the product is a measure of what is in it for the customers involved. It is a measure of how well the end product meets the involved essential needs, and the added desires of those that have a voice in the product selection or its use. An end product is to always supply the essential need, or its worth will be poor.

3.7.3 Function

One of the most unique and useful qualities of the Value Method is its use of functions to describe the activity or product being studied. The value study breaks the “project” into components to avoid misunderstanding of the planned intents for the project. Then a Functional Analysis is conducted on each component. In the VM process, functions are limited to the shortest sentence possible. Just two words are usually allowed: a verb (active preferred) and a noun (measurable preferred). The main functional purpose for the component being studied is the primary function. Of course, things often happen as a result of the choice of a component, or something should be done to make the selected component work as needed. These functions are called supporting or secondary functions. The results of the functional analysis are placed into a function-logic diagram called a FAST (a short term for Functional Analysis System Technique).

3.7.4 Life Cycle Costs

The true cost of an item is not just the amount of money that you pay when you buy it — much more is involved. When you buy something, you also buy its long-term effects. The initial costs plus these long-term costs are called life cycle costs. This includes things like the time involved to complete the project, the people needed (number, expertise and so on), the degree of difficulty involved, availability of money or other resources, the amount of maintenance needed, and the money to be expended and kept in reserve.

3.7.5 Systematic and Organized

The VM process uses tested and successful procedures that are directed toward achieving success in meeting the purposes for the “project” by all involved. The process instills “common understanding,” generates high production and high performing team activities,

reduces the time necessary to obtain a product, and focuses the efforts on the purposes behind the project or activity being studied. A standard “job plan” is used to guide the entire process.

3.7.6 Alternatives

VM generates, examines, and refines creative alternatives toward the concept of producing an end product that produces customer acceptance. The process endeavors to widen the number and scope of the available alternatives. This is done to increase the potential for enhanced satisfaction, and take advantage of the added expertise brought into the studied activity through the value study process.

3.8 DOE Value Management Program Key Practices

The statutory and regulatory definitions encompass analysis of functions performed by a team of qualified personnel directed at improving performance, reliability, quality, safety, and life cycle costs of products, systems or procedures. The study of functions helps to achieve “best value” for resources involved by improving the relationship of worth or utility to monetary cost. The best value is associated with an item performing its function at an optimum level of quality, reliability, maintainability, and life cycle cost. VM reduces processes, equipment, facilities, services, supplies, or products to their most basic functional elements and then looks for cost-efficient alternatives.

As a minimum, proper VM practice will include all of following items:

- Identified initiatives
- Invested resources
- Implementable recommendations
- Identifiable return on investment.

The goal of VM is to ensure that the owner, user, and other stakeholders, receive a product that provides the greatest “value,” or return on investment. VM processes and practices emphasize return on investment in terms of life cycle costs to maintain or improve desired levels of capability and performance during planning, acquisition, execution, and procurement activities.

3.9 Value Management Program Scope and Application

VM application should focus on high-cost activities of the DOE to realize maximum return on investment. The areas selected should benefit from thorough analysis to identify alternate ways of achieving the same or improved functions that enhance operational quality, performance, readiness, or safety at a lower life cycle cost. However, all VM applications

will not necessarily result in an immediate cost reduction. The VM investment should be scaled to the application being evaluated.

Development of annual VM Program Plans is one way the Departmental Element can identify what can reasonably be accomplished in their element through application of VM. The VM Program Plan can show how this Practice's recommendations or other VM guidance is being implemented. Consideration should be given to having a section of the Plan that can be updated annually to show candidate VM Studies for the coming year as well as budget needs. An effective VM Program should eventually be self-supporting.

4.0 VALUE MANAGEMENT PROCESSES

A successful VM Program will result from several efforts being effectively integrated. The most recognized effort is the Value Study with resulting recommendations. However, there should be an in-house infrastructure to help identify study opportunities and provide required reports of VM results. VM Study recommendations are implemented for results to be effective. In-house, contracted, and cost avoidance savings require different methods of implementation.

4.1 Value Management Study

In the DOE, VM has been historically restricted to construction of individual fixed capital asset facilities. Typical application has been during the planning phase both to develop conceptual alternatives and during design or construction, and to support cost reduction or problem resolution efforts. Recently, VM applications have successfully expanded to include work processes, organization structures, systems, and programs.

4.2 Process for Selecting Study Subjects

Statute and regulations pertaining to VM provide agencies with the authority to define criteria for selecting value study opportunities. Within agencies, these opportunities exist in programs, projects, systems, products (including fixed assets), and services. Congress has suggested applying VM to the highest 20% of projects, ranked by dollar value. OMB A-131 uses a \$1M minimum threshold above which VM should be accomplished. The Department recommends that each Department Element establish a criteria and selection process that best meets their needs. This criteria and selection process should be documented in a VM Program Plan.

4.3 Application of the Value Study

Project need should be the main criteria for initiating a VM Study. However, management approval and support should be in evidence before committing to a major effort. Any VM Study effort should follow the guidance of the SAVE International Value Methodology Standard. The Value Methodology Standard uses a structured, systematic "Job Plan"

approach comprised of three stages (pre-study, Value Study, and post study). The focus of the Value Study is on functions and requirements, and incorporates various techniques to complete a comprehensive analysis. Best results from a Value Study are obtained when the study is led by a trained, and preferably, certified value practitioner.

The following observations are provided as guidance and are based on actual experience in VM practice.

- Value studies ideally are applied early in the program or project so that existing plans, processes and designs are disrupted as little as possible. Early phases (planning and design) of an acquisition yield the highest return on investment, usually as cost avoidance.
- Execution or operations phases and systems/procedure applications provide cost savings.
- The more complex or higher dollar item being examined requires more effort to implement because of the larger impact on resources and the number of diverse parties involved.
- Relatively simple systems/processes or those items that have been subject to rigorous VM generally will indicate relatively small returns on investment. Generally, disproportionate returns-on-investment indicate incomplete effort in the original system.

4.4 Value Management Process

VM studies are to be structured and focused to achieve desired objectives. Experience has demonstrated that the following eight-step process (Job Plan) will generally lead to satisfactory results.

4.4.1 Selection Phase

Projects are monitored and identified for VM study. Projects that are required to be studied under mandated programs are monitored to ensure that the project is studied at an optimum time to maximize the benefits of study results.

4.4.2 Investigation and Preparation Phase

Preliminary data for document preparation and team use is gathered and coordinated with design, planning, or relevant type of team to ensure study team is not delayed during study dates. The VM coordinator handles the project selection, study dates, facilities, study team selection, and management commitments. Study team is contacted and informed of the responsibilities expected of them during the study dates.

4.4.3 Information Phase

In this phase, the study team participates in several features: a project team briefing; determining active parties, project criteria, and limits governing the study and project;

identification of components in terms of functions; generating a cost model for the components and their functions; preparing a Functional Analysis System Technique diagram; revising previous work based upon the resulting final Functional Analysis System Technique; identification of any potential “value mismatches”; and clarification of any final information requirements.

4.4.4 Speculation Phase

Generation of ideas for alternatives to perform the basic functions and potential “value mismatches” identified in the Functional Analysis System Technique for the project. Quantity not quality is the objective. A conducive and comfortable atmosphere to allow individual freedom of expression is stressed. Several methods may be employed but brainstorming is the most common approach used in the typical study.

4.4.5 Analysis Phase

Elimination of alternatives not meeting the basic functions, exceeding the study limits, or with such poor potential as to exhibit little promise for further effort. Remaining ideas are ranked, combined if needed with other ideas, and grouped for future action. Ranking may be performed by several procedures. Reclamation preference is team consensus or criteria weighting matrix procedures. Responsibilities for completion of the development of the ideas are made by team member volunteering.

4.4.6 Development Phase

The remaining ranked ideas are developed and refined by team members. They may call upon and use consultants to assist the team if needed. A process of ensuring the idea is practical, determining if it has possibility of being of value (usually meaning economic), refining the idea and continuing to ensure it is practical for use, and cost estimating is used. Once one idea is fully developed is that idea prepared for presentation and the next idea on the list developed.

4.4.7 Presentation Phase

Each team member participates in a formal presentation to tender the results of the study team’s efforts to management, client representatives, and project team (often this is a design team). A written, published presentation report is presented to attendees at this presentation.

4.4.8 Implementation & Follow-up Phase

Using any additional information resulting from the oral presentation(s), a final report encompassing the study team presentation report and any additional information is completed, published, and transmitted to all interested parties. An accountability report is requested, or required if study is mandated of the decision-makers, and follow-up with those

parties is maintained until the implementation decisions are completed. Success of the overall program and each study is monitored and reported.

During the implementation and follow-up phase, management is to assure that approved recommendations are converted into actions. Until this is done, savings to offset the cost of the study will not be realized. Some degree of investment is usually required if a VM opportunity is to become a reality. Funds for implementation are to be provided to support the actions necessary to capture the savings opportunity. Implementation progress is monitored just as systematically as proposal development. It is the responsibility of management to ensure that implementation is actually achieved. Often, the VM focal point or project manager is responsible for monitoring milestone achievement in the implementation plan.

A VM study is not completed with implementation of an idea. Full benefit is not derived from a proposal until follow-up is completed; other applications of the proposal and actual results need to be established. Successful VM actions are to be entered into the DOE VM database, and cost savings and other benefits reported through command channels. Until then, the records on a project cannot be closed.

4.5 Value Study Products

The primary product of a VM Study is the value recommendation(s). When a VM Study is complete, the recommendation(s) should be prepared and presented to the authorizing management in a timely manner to assure probability of implementation, and to enable execution of other related work without interruption. As a minimum, recommendation(s) should include the following:

- Current Method (baseline): verification of the current scope of work, cost, and schedule to be impacted by the recommendation(s).
- New Method (revised baseline): verification of the scope of work, new cost, and schedule, and how the new recommendations(s) will be accomplished.
- Feasibility assessment: assessment should include major differences (such as benefits, risks, and other related impacts of implementation) between the current baseline and the new method.
- Assurances that no adverse safety or environmental consequences will occur due to the recommended change(s).

If management accepts the recommendations(s), then the recommendations(s) should be implemented. If management rejects the recommendation(s), and the net change is larger than \$5M or has significant risk, then the recommendation(s) should be reviewed by the next level of management. The U.S. Army Corps of Engineers uses \$1M for this threshold.

5.0 REPORTING RESULTS

5.1 Value Study Reports

Information in the report should be complete, technically accurate, easily understood, and consistent with information provided to the study team by the official authorizing the VM Study. VM Study reports generally should include the following:

- Document number and date
- Names of sponsoring company and performing Value Specialist
- Value Study General Information (list of team members and facilitator, study dates and location, total time spent on the project, etc.)
- Subject matter scope
- Executive summary
- Background Information
- Function Analysis (including Function Analysis System Technique Diagram)
- Life Cycle Cost Analysis (unless inappropriate)
- Evaluation Criteria
- Developed VM Proposals
- Quantitative, Qualitative, and Intangible Results (value or worth to be measured in dollars if possible and appropriate)
- Implementation Options.

The VM Study Report should be submitted in a consistent format and should include cost saving or cost avoidance and the return on investment. It should also include, on a separate attachment, appropriate supporting documentation sufficient to permit a technical and financial assessment of the implemented improvement.

5.2 Value Management Change Proposals

A VM change proposal should generally conform to stipulations identified in FAR Part 48 and Part 52.28-1 and 52.248-2.

Basic components in each VM change proposal are typically:

- Description of existing and proposed requirements, along with benefits and disadvantages of the change.
- Description of the scope of the changes, including regulatory or other waivers.

- Detailed cost estimate and supporting data to establish a baseline for the existing and proposed changed condition, including all costs associated with preparing and implementing the VM change proposal.
- Schedule for acceptance and implementation focused on maximum cost reduction.
- Suggested cost sharing period for the VM change proposal.
- Certification that the data submitted is accurate, complete, and current as of the date of the final agreement of the net savings.

5.3 Annual VM Report

OMB requires an annual report of VM Program status. The current feeder report format is provided in Figure 1.

Part I of the report asks for net life cycle cost savings achieved through VM. In addition, it requires agencies to show the project/program dollar amount thresholds the agency has established for requiring the use of VM if greater than \$1M. If thresholds vary by category, show the thresholds for all categories. Savings resulting from VM proposals and VM change proposals should be included under the appropriate categories.

Part II asks for a description of the top 20 fiscal year VM projects (or all projects if there are fewer than 20). List the projects by title and show the net life cycle cost savings and quality improvements achieved through application of VM.

Part III requires agencies to submit a detailed schedule of year-by-year cost savings, cost avoidances, and cost sharing with contractors for each program/project for which the agency is reporting cost savings or cost avoidances. The aggregate total of all schedules equals the totals reported in Part I.A. of the annual report.

The Office of Engineering and Construction Management will coordinate the compilation of all data for the Department and will submit the final report to the OMB. The call for data will be distributed annually. The Heads of Field Elements reports are to be submitted to the Office of Engineering and Construction Management by November 15 of each year. Each VM point-of-contact should establish an efficient process for the collection and consolidation of this data and information.

5.4 VM Program Product Requirements

Most of the products produced through the VM Program have been described in the aforementioned information. The following is a summary listing of those products:

- OMB Data Call
- Annual VM feeder and Program Report
- OMB Report

- Good Practice Guide Document and associated maintenance
- Department VM Home Page including lessons learned
- Value Study Reports with associated VM change proposals and VM proposals
- VM Self Assessment Reports
- Department Element VM Program Plan.

5.5 Measuring Results

5.5.1 Measures

VM practice has been historically measured in terms of cost savings or cost avoidance. These measurements tend to be absolute and may not always reflect whether improvement or desired results are happening; using other metrics may more accurately depict the benefits to be gained. Since efficiency and cost-effectiveness are intrinsic to value, the following set of general objectives, measures, and expectations may be useful:

Objectives	Measures	Expectations
Use VM as a process tool to improve efficiency and cost effectiveness in acquiring and managing fixed assets.	A VM program is in place or value methodology has been applied to a project, system, or item. 1. Return-on-investment for value studies 2. Number of value studies conducted over number of studies planned	Annual report to DOE-HQ required for VM. Demonstrates VM practices and processes have resulted in improved life cycle fixed asset management.
Use VM as a process tool to improve efficiency and cost effectiveness in programs, systems, and processes.	VM methodology has been identified by management as critical contributor to best management practice.	Opportunities for VM practices and processes are actively sought.

5.5.2 Lessons Learned

Sharing of lessons learned will provide an opportunity for the exchange of successes and missed opportunities. For instance, if a regulatory driver or perception impacted the acceptance of a value proposal, this could be noted and shared with other locations. This would allow others to share in that knowledge, thus reducing the potential for committing funds and effort to provide solutions that are unacceptable.

A section for providing lessons learned will be included on the annual feeder reports for submission to DOE-Headquarters and it is recommended that the complex-wide lessons learned process will be used for innovative and corrective action items.

5.5.3 Self-Assessments

Each Department Element Self-Assessment Program should include an assessment of the VM Program. This assessment should focus on the management effectiveness of this program and the relative returns being received from the Program's utility. Appropriate measures should be taken for the continual improvement of the VM Program.

5.6 Value Management Tools

A number of tools are available for use in implementing a VM Study. These tools consist principally of forms that can be used to describe, develop, compare, evaluate and recommend.

These forms are provided as examples only, and should be tailored to the needs of each project and each VM Study. A few of the more common sample forms include:

- VM Proposal.
- VM Description.
- VM Alternative evaluation.
- Value Study.
- VM Fast Diagram.
- VM Analysis matrix.
- VM Criteria weighting process.
- Implementation of proposal.

6.0 VALUE MANAGEMENT EXAMPLE

An example of a VM study and report is provided for clarification of the VM process in Attachment 1. A Functional Analysis System Technique diagram is also provided.

ATTACHMENT 1. SAMPLE VALUE MANAGEMENT STUDY & REPORTS

EXAMPLE VALUE ENGINEERING STUDIES AND REPORTS

The purpose of a value management (VM) study is to provide assistance in planning a project that will meet its basic required function at the least possible total cost of effective ownership without compromising its quality in terms of performance, reliability, and maintainability. This example describes one of several proposals in a value engineering report based on a study conducted for the Process Waste Treatment Facility (PWTF) to be constructed at Oak Ridge National Laboratory in Oak Ridge, Tennessee. The PWTF was designed to replace the current Process Waste Treatment Plant, provide treatment of process wastewater contaminated with Cesium-137 and Strontium-90 to meet regulatory requirements, and produce a solid waste that would meet relevant waste acceptance criteria.

The study used the traditional VM job plan process in a workshop context. This process is a team effort that usually takes place within a 40-hour period using a comprehensive, systematic approach. Before the VM study began, all necessary background information was collected, and cost and graphical models relating to design, construction, and operational requirements were compiled (including all information such as funding limitations, environmental data, constraints, criteria, etc.). The information gathered in the initial stage is identified in the VM report. The Project Description section of the PWTF VM report contains a listing of the project economic data; the functional analysis diagram; and a detailed project description stating the objectives and requirements of the project, waste characteristics, design drawings, and a cost model.

The VM job plan process consists of five phases: the Information Phase, the Speculative or Creative Phase, the Analysis or Judgement Phase, the Development Phase, and the Presentation or Recommendation Phase. In the Information Phase of the PWTF VM study, the project team met with the VM team several times to present the project design and requirements and for a site visit. A key step in this phase is conducting function analysis and preparation of a FAST diagram (see Figure 10). This diagram shows all required functions of the project and the relationships of all functions to each other. This is critical because functions drive requirements, and requirements cost money. In the Speculative or Creative Phase, the VM team conducted a brainstorming session to identify any potential opportunities for value improvement (i.e., more cost-effective design solutions for constructing the project that would still satisfy all technical and environmental requirements). In the Analysis or Judgement Phase, the VM team and the project team analyzed and evaluated all ideas generated in the brainstorming session. Ideas with the greatest potential cost savings or that would improve the project in other ways were developed as proposed alternatives in the Development Phase; these alternatives were then ranked from "1" to "10", with "10" being the most desirable. Ideas ranked "8" or higher were considered viable alternatives. Alternatives that represented an improvement to the project, but could not be sufficiently estimated within the time allowed for the study, were considered "design suggestions." The PWTF VM team generated 35 creative ideas that resulted in 21 viable alternatives. Research and development of these alternatives yielded nine proposals for change and three design suggestions. Each of these proposals and design suggestions were presented to the project (and contractor) team representatives in the Presentation or Recommendation Phase of the study at the end of the workshop.

The proposed changes and design suggestions for value improvement of the PWTF project are contained in the VM report in tabular format and are accompanied by design sketches and estimated cost savings. The following illustrates one of the several cost reduction recommendations of the PWTF VM team.

- Design a two-story building instead of a one-story building to reduce the building footprint; this will avoid remediation of a hazardous landfill prior to construction and result in potential cost savings of approximately \$1,099,210 (illustrated below).

Example (cont.)

Value Management Proposal					
Project: X-10 Process Waste 26/94 Treatment Facility, ORNL		Date: 08/23-		Proposal No. B-1	
Item: Design Two-Story Building				Sheet No. 1 & 2 of 6	
<p>Original Design: (Attach sketch where appropriate) Provided a one-story, 10,504 sq. ft., pre-engineered metal building with a slab on grade and accompanying site work. This will include excavation to establish elevation, hazardous solid waste removal and utilities relocation.</p> <p>Proposed Change: (Attach sketch where appropriate) Provide a 7,669 sq. ft. pre-engineered metal building with a 2,835 sq. ft. mezzanine over the laboratory and control room areas. Reduce the site work accordingly.</p>					
Cost Summary	Total Labor and Material	Markup	Capital Cost	Life Cycle Cost	Total Cost
Original Design	\$3,682,000	2.87	\$10,567,340	\$ ----	\$10,567,340
Proposed Change	\$3,299,000	2.87	\$ 9,468,130	\$ ---	\$ 9,468,130
Savings			\$ 1,099,210	\$ ---	\$ 1,099,210

Management

Submitting Field Element – DOE Albuquerque Field Office Reporting Period – FY 1987

Contact Person and Telephone Number – Jerry Wilson, FTS 844-3291

- A. Estimated total amount of funds invested in VM this FY - \$ 375K
 - 1. Funds invested in DOE-sponsored programs - \$375K
 - 2. Funds invested by contractors (VM change proposal costs) - \$0
- B. Estimated VM savings achieved this FY - \$ 20 Million (M)
 - 1. Savings achieved by implemented DOE-sponsored studies - \$20M
 - 2. Savings generated by accepted VM change proposals - \$0
- C. Total employees assigned to VM: Federal – 1, Contractor - 0
 - 1. Number of full-time employees: Federal – 1, Contractor – 0
 - 2. Number of FTEs: Federal - 1, Contractor - 0
- D. Number of Department employees receiving 8 hours or more of VM training this FY:
Federal - 42, Contractor - 76
- E. Number of Department employees receiving under 8 hours of VM training this FY:
Federal - 22, Contractor - 0
- F. Number of VM proposals received this FY
VM proposals - 135, VM change proposals - 0
- G. Number of VM proposals approved this FY:
VM proposals - 70, VM change proposals - 0
 - 1. Funds Invested. Estimates should include salaries and overhead expenses of VM employers, VM employees, VM training costs, costs for contracting for VM services, VM proposal or VM change proposal development and implementation costs, and any other costs directly associated with your VM program. Overhead may be estimated at 50% of salaries.
 - 2. Savings. Savings are defined as a reduction in or the avoidance of expenditures that would have been incurred except for the VM program. Savings should be reported in the year incurred; i.e., in the year that the reduction or cost avoidance actually occurs. Recurring savings resulting from a specific VM effort should be reported for a maximum of three years—the initial year and the two subsequent years. Procurement savings resulting from VM efforts should be calculated in accordance with FAR 52.248-1(g).

**Figure 1. Sample Value Management
Annual Report Summary (Feeder for OMB Annual Report)**

VALUE ENGINEERING PROPOSAL

PROJECT:		
COMPONENT:		FUNCTION:
ORIGINAL CONCEPT	VM CONCEPT	
COST ITEMS	NON-RECURRING*	LIFE CYCLE*
ORIGINAL CONCEPT		
VM CONCEPT (-)		
SAVINGS		
NUMBER OF UNITS (X)		
TOTAL SAVINGS		
VM STUDY COSTS (-)		
IMPLEMENTATION COSTS (-)		
NET SAVINGS		

* Choose one method – use Non-Recurring if Life Cycle Costing does not apply.

Figure 2. Sample Value Management Proposal Forms

PROJECT:	
COMPONENT:	FUNCTION:
ALTERNATIVE DESCRIPTION	
BENEFITS	DISADVANTAGES

Figure 4. Value Management Alternative Evaluation

PROJECT:		
COMPONENT:		FUNCTION:
ORIGINAL CONCEPT		VALUE STUDY CONCEPT
•		•
COST ITEMS	NONRECURRING*	LIFE CYCLE*
ORIGINAL CONCEPT	\$	\$
VALUE CONCEPT (-)	\$	\$
SAVINGS	\$	\$
NUMBER OF UNITS (X)	1	1
TOTAL SAVINGS	\$	\$
VALUE STUDY COSTS (-)	\$	\$
IMPLEMENTATION COSTS (-)	\$	\$
NET SAVINGS	\$	\$

** Choose one method – use Non-Recurring if Life Cycle Costing does not apply.*

Figure 5. Value Study

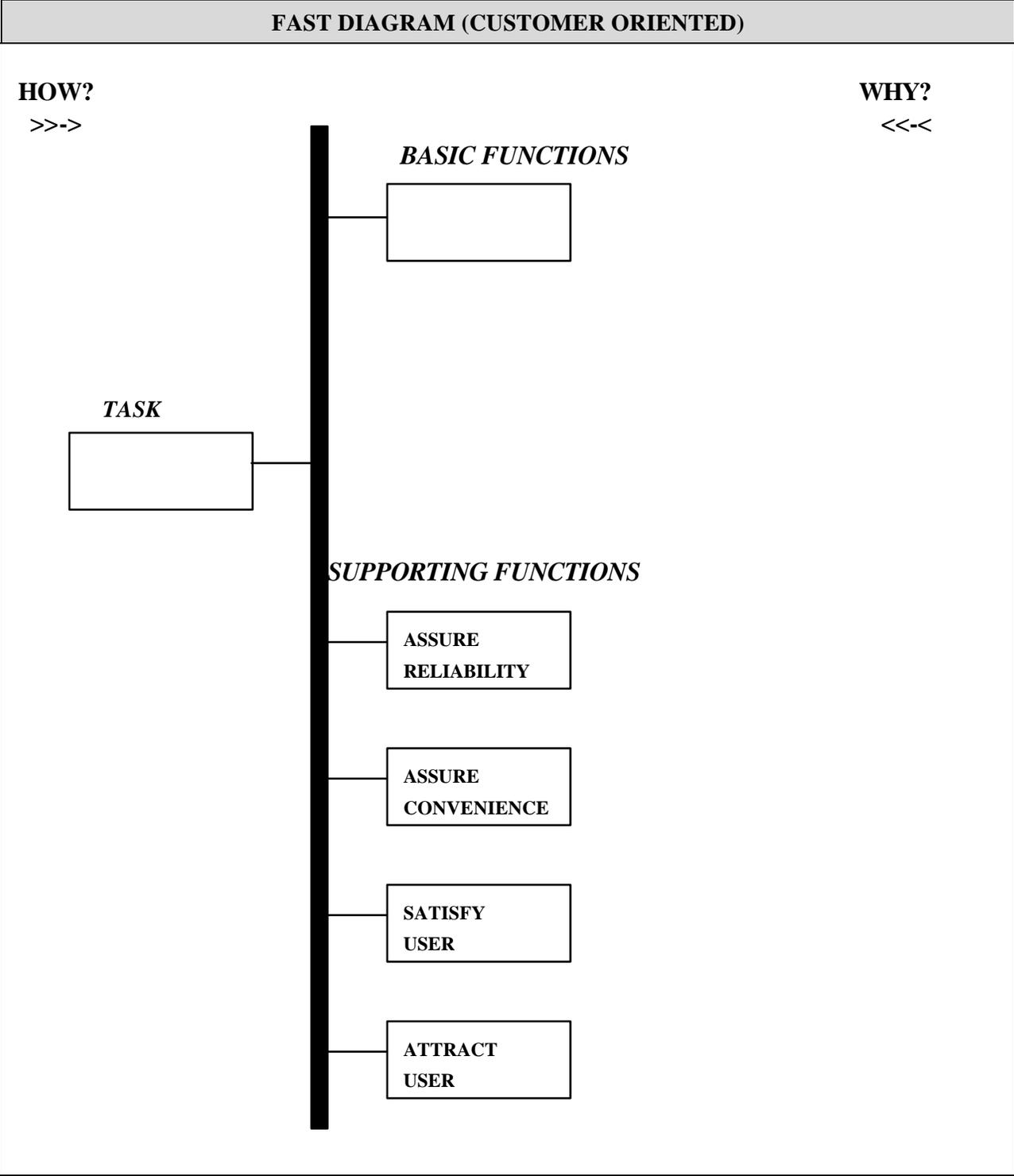


Figure 6. FAST Diagram

Project:																					
Component:						Function:															
RATING:	P	F	F	I	R	S	CRITERIA:				T	O	T	A	R	A	N	K			
5—Excellent	E	U					D.	A.	E.	B.									F.	C.	G.
4—Very Good	R	N					A.	E.	B.	F.									C.	G.	
3—Good	F	C	A.	E.	B.	F.	C.	G.	A	B	C	D	E	F	G						
2—Fair	O	T	A.	E.	B.	F.	C.	G.	A	B	C	D	E	F	G						
1—Poor	R	I	A.	E.	B.	F.	C.	G.	A	B	C	D	E	F	G						
ALTERNATIVES	S	N	A.	E.	B.	F.	C.	G.	A	B	C	D	E	F	G						
1. Present Way	M	O	A.	E.	B.	F.	C.	G.	A	B	C	D	E	F	G						
2.	S	N	A.	E.	B.	F.	C.	G.	A	B	C	D	E	F	G						
3.	M	O	A.	E.	B.	F.	C.	G.	A	B	C	D	E	F	G						
4.	S	N	A.	E.	B.	F.	C.	G.	A	B	C	D	E	F	G						
5.	M	O	A.	E.	B.	F.	C.	G.	A	B	C	D	E	F	G						
6.	S	N	A.	E.	B.	F.	C.	G.	A	B	C	D	E	F	G						
7.	M	O	A.	E.	B.	F.	C.	G.	A	B	C	D	E	F	G						
8.	S	N	A.	E.	B.	F.	C.	G.	A	B	C	D	E	F	G						
9.	M	O	A.	E.	B.	F.	C.	G.	A	B	C	D	E	F	G						

Figure 7. Value Management – Analysis Matrix

Project:			
Component:		Function:	
Criteria		Raw Score	Ranking of Criteria
A.			
B.			
C.			
D.			
E.			
F.			
G.			
H.			
I.			
J.			
K.			
L.			

	B	C	D	E	F	G	H	I	J
A									
	B								
		C							
			D						
				E					
					F				
						G			
							H		
								I	
									J

HOW IMPORTANT?

- 4 – Major preference
- 3 – Medium preference
- 2 – Minor preference
- 1 – Letter/Letter – No preference – each scores

Figure 8. Value Management - Criteria Weighting Process
(Numerical Evaluation by Paired Comparison)

PROJECT:
CRITICAL ITEMS TO CONSIDER:
•
PROBLEMS AND HOW THEY CAN BE OVERCOME:
•
PROCEDURES: (WHO DOES WHAT)
•
SUMMATION OF BENEFITS AND DRAWBACKS OF THE VALUE STUDY PROPOSAL:
Benefits:
Disadvantages:

Figure 9. Implementation of Proposal

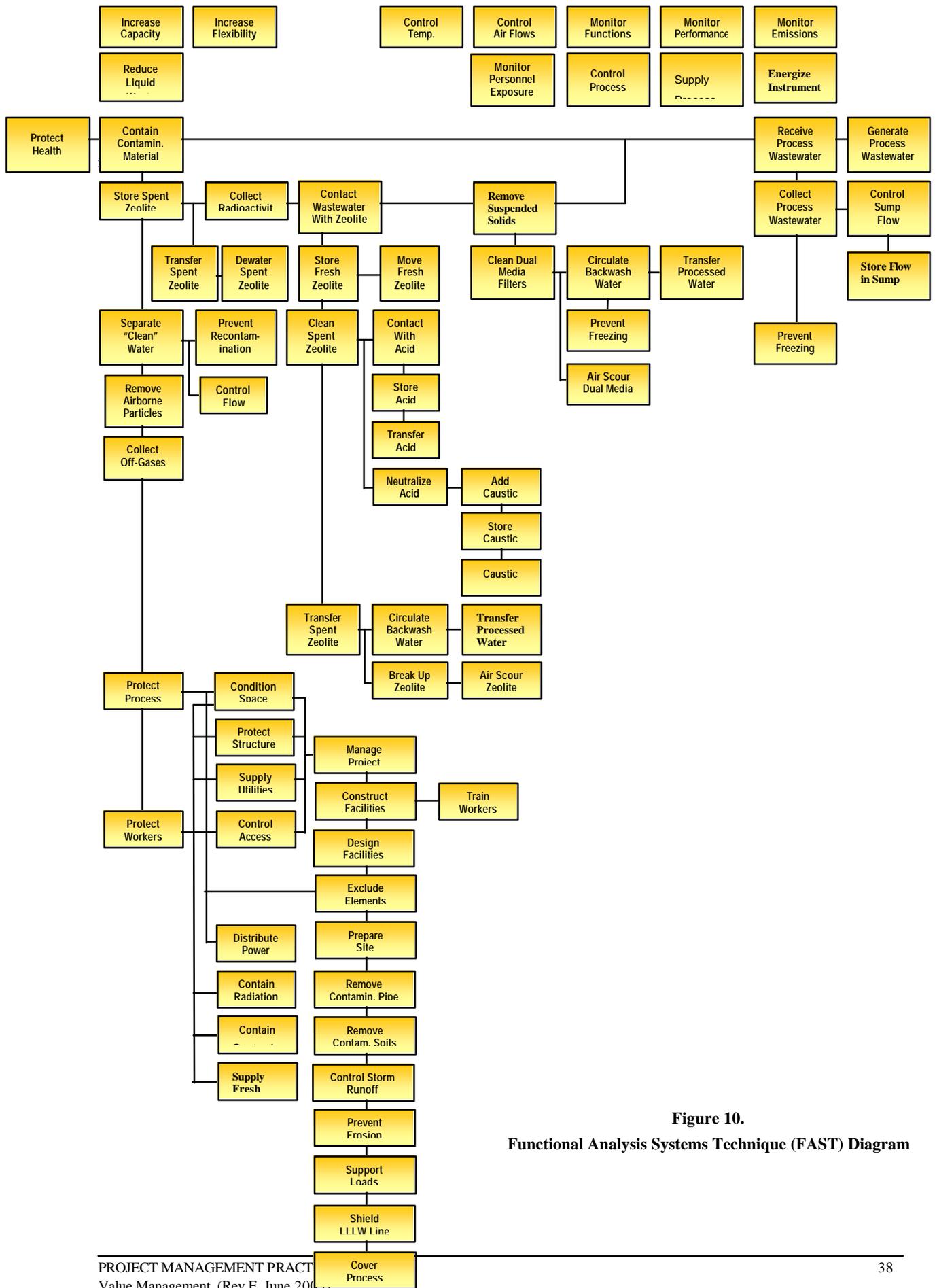


Figure 10.
Functional Analysis Systems Technique (FAST) Diagram