Chapter 23.3 Value Engineering

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23.3.1 Introduction.

23.3.1.1 Purpose. The purpose of this chapter is to provide guidelines and procedures for the implementation and application of Value Engineering (VE) analysis on Indian Health Service (IHS) facilities design and construction projects. These instructions are in conformance with Federal requirements contained in Office of Management and Budget Circular A-131, Value Engineering, dated December 26, 2013.

23.3.1.2 Applicability. The information found herein is applicable to all IHS new construction, major renovation, joint venture, small ambulatory, maintenance and improvement projects, and facility operations, unless otherwise noted.

IHS will evaluate all projects for VE potential. Those projects judged to have significant potential for life cycle cost (LCC) reduction shall be formally value engineered. These analyses will result in designs providing the essential functions at the lowest LCC consistent with required performance, reliability, quality, and safety.

23.3.2 Definitions.

(1) **Base Year:** The base year is the first year of the VE study period.
(2) **Internal Rate of Return:** The compound rate of interest that, when used to discount study period costs and benefits of a project, will make the two equal.
(3) **Life Cycle Cost (LCC):** The sum of all costs over the useful life of a building, system or product including the costs of design, construction, acquisition, operation, maintenance, repairs, disposal and salvage (resale) value, if any, using present worth costs. Consistent with 42 USC § 8254 the study period for determining life cycle costs shall not exceed 40 years from beneficial use. For evaluating proposed capital investment projects the modes of analysis to be used include:

    a) Total Life Cycle Costs

b) Net Savings
c) Savings-to-Investment Ratio
d) Payback Period
e) Internal Rate of Return

The above modes of analysis except "payback period" are fully consistent with a LCC approach, because they take into account all relevant values over the entire study period and discount them to a common time basis. The "payback period is not fully consistent with a LCC approach because it includes only those values up to the time of payback and, in its simple version, does not adjust them for time differences. It is used in the LCC only as a supplementary measure to the life-cycle costing measures. A discussion of these five LCC applications is provided in the Department of Energy NBS Handbook 135, Life-Cycle Costing Manual by Sieglinde K. Fuller & Stephan R. Peterson, 1995 edition.

(4) **Net Savings (NS):** The time-adjusted savings less time-adjusted costs taken over the study period.
(5) **Present Worth (PW)**: The time-equivalent value of past, present, or future cash flows as of the beginning of the base year.
(6) **Savings to Investment Ratio (SIR):** The ratio of present worth savings to present worth investment costs.
(7) **Society of American Value Engineers (SAVE)**: A professional society dedicated to the advancement of value management through education to provide a better understanding of the principles, methods, and concepts of value technology.
(8) **Value Engineering (VE):** A systematic process of reviewing and analyzing the requirements, functions and elements of systems, project, equipment, facilities, services, and supplies for the purpose of achieving the essential functions at the lowest life-cycle cost consistent with required levels of performance, reliability, quality, or safety.
(9) **Value Engineering Change Proposal (VECP):** A proposal developed by a construction contractor under a value engineering clause in its construction contract that typically involves sharing in any resulting savings. VECPs are intended to optimize value by lowering overall costs, increasing overall function, or a combination of both. In some cases, proposals may increase value without reducing cost or may even increase cost.
(10) **Value Engineering Proposal (VEP):** In connection with an A/E design contract, a VEP is a proposal for change developed by the A/E design firm, employees of the Federal Government, or a specialized VE consulting firm. The proposal is similar to the VECP described above and is generally performed on a partially completed facility design. However, it is noted that there is no cost sharing of projected savings during the design phase. In some cases, proposals may increase value without reducing cost or may even increase cost.

23.3.3 Regulations, Guidelines, and Policy. The following is a list of Federal regulations, guidelines, and policies governing VE for IHS projects:

(1) OMB Circular A-131, Value Engineering, dated December 26, 2013
(2) HHS Facilities Program Manual, Section 3-8: Value Engineering, dated December 16, 2010
(3) FAR, Part 48 – Value Engineering

23.3.4 Value Engineering Requirements.

23.3.4.1 Procurement.

FAR, subpart 48.201, requires the contracting officer to include a VE clause in solicitations and contracts for architect/engineer (A/E) services when the Government concludes that substantial savings might result from a VE effort. A sample VE Scope of Work is provided in Attachment A.

23.3.4.2 Funding.

The payment for VE services performed by non-government employees is an authorized expense of project design funds. These services must be separately priced in the A/E contract, and are in addition to the six percent fee for A/E design services.

The cost of VE activities conducted by Government employees, in most instances, will be paid by the program operating expenses rather than the project design funds. In general, VE services will be quantified in terms of "level of effort," rather than as a deliverable.

23.3.4.3 Project Selection Criteria.

Projects will be selected for formal VE analysis before award of the A/E design contract or delivery order, or before the beginning of an in-house design. The VE coordinator will be responsible for the application of the selection criteria:

(1) A VE analysis is mandatory for projects with a construction cost of $5 million or greater.
(2) A VE analysis is optional, but recommended, for projects having a construction cost less than $5 million.
(3) A formal VE analysis by a specialized consultant (independent from the A/E) or Government personnel is mandatory for projects with a total project cost of $10 million or greater.
(4) Design-Build projects that are procured using full and open competition and are awarded based on a best value selection process are exempt.

23.3.4.4 Value Engineering Checklist.

The common functional areas where VE potential is frequently identified are listed below:

- Foundations
- Conveying System
- Substructure
- Mechanical System
- Superstructure
- Electrical System
- Exterior Closure
- General Conditions/Overhead/Profits
- Roofing
- Equipment
- Interior Construction
- Site Work

An expanded listing of the 12 functional areas is provided in Attachment B.

23.3.4.5 A/E Design Value Engineering Requirements.

A value engineering analysis should be performed on all projects selected for VE analysis when the schematic design stage is 50 to 95 percent complete and before the beginning of design development. This analysis may be performed by the A/E VE team, a VE consultant or a Government VE team. Regardless who performs the VE analysis, the VE team shall consist of a minimum of three members with expertise in value engineering. One team member shall be the team leader and shall have a formal VE training.

The contracting officer, VE coordinator, project manager, customer representative, and technical representative for each discipline may be involved in determining the scope of the VE analysis.

23.3.4.6 Value Engineering Requirements During Construction

FAR, subpart 48.201, requires the contracting officer to include a VE clause in solicitations and contracts for construction services with estimated costs equal to or greater than the simplified acquisition threshold. It also permits the contracting officer to include a VE clause in contracts for construction projects of lesser value when the Government concludes that substantial savings might result.

The contracting officer and the project manager shall review and accept or reject the VE change proposals in accordance with the policies and procedures outlined in the FAR, subpart 48.103(b). These procedures also require the contracting officer to accept or reject VE change proposals within 45 days of their receipt or advise the contractor in writing of the anticipated decision date.

For VE change proposals that are accepted, the Government and the contractor shall share the savings, as outlined in FAR, subpart 48.104.

23.3.4.7 Value Engineering Report

Reports Prepared for Each VE Analysis – The team performing the value engineering analysis will prepare two reports. The first, completed at the completion of the VE analysis, should include the following:

(1) A summary of the actions recommended by the value engineering team.

(2) A VE proposal for each recommended changes to the reviewed design. A sample VE Proposal Form is provided in Attachment C.

(3) A description of the differences between the existing and proposed designs, including:

- a comparison of the advantages and disadvantages of implementing each VE proposal,
- an explanation of the recommended functional areas changes; and
- an analysis of the effect of the changes on system or facility performance and a review of any test data.

This description may include sketches, calculations, and models.

(4) A list of design criteria and specifications that must be changed if the VE proposals are accepted, with an analysis of how each change will affect project cost and the building life cycle cost.

(5) A summary of the estimate of costs the Government may incur by implementing the VE proposals, including costs to modify or revise the existing design, perform necessary tests and evaluate the efficiency of the new design.

(6) A list of effects that the proposed changes may have on the life cycle cost of the various functional areas. It is recommended that all costs comparisons use the normal life of the functional areas under review and the discount rate on the composite yield of the current six-month Treasury Bonds.

(7) A list of effects of the VE proposals on design and construction schedules.

(8) A description of the VE team including a statement of each individual member's qualifications.

The VE analysis might determine that increasing the estimated construction and/or capitalization costs of a project could result in savings over the lifetime of the facility. A VE analysis evaluates and compares all costs associated with the useful life of the building, including operation, maintenance and other life cycle costs. Should the VE analysis indicate, that by increasing initial

construction costs, savings could be achieved over the useful life that would offset the higher initial costs, the VE report would recommend that the project budget would be amended to reflect the higher construction cost.

The second report prepared by the team performing the value engineering analysis will document the accepted VE proposals and VE change proposals. These will be grouped by functional area, and will be made available to IHS staff and A/E performing work on new IHS facilities. This information may be included on the VE Cost Estimate Form (Attachment D). The purpose of this report is to collate information, to document functional areas where cost savings are accomplished, and make recommendations for modifications and revisions to plans, designs, construction techniques, etc., that might result in cost savings over the life of the building.

23.3.5 Responsibilities.

23.3.5.1 Staffing. Each office involved with managing design or construction contracts or directly performing design shall designate a VE Coordinator (VEC) to coordinate the office's VE activities.

23.3.5.2 Training. Each office should ensure that the VEC has a formal VE training. This includes ensuring that the VEC attends the 40-hour SAVE course. Each office will also ensure that technical staff training emphasizes courses in new technology with the potential for greater efficiency and effectiveness that might translate into cost savings. Also, each office should provide training in VE techniques to technical staff responsible for coordinating and monitoring VE efforts, and for developing, reviewing, analyzing, and carrying out VE proposals, change proposals, and reports.

Each office involved with the management of architect/engineer (A/E) design or construction contracts or directly performing design shall designate a Value Engineering Coordinator (VEC) who has received Society of American Value Engineers (SAVE) 40 hour approved training to coordinate the office's VE activities.

23.3.5.3 Coordination. The contracting officer is responsible for determining which contracts are subject to formal VE and for formally accepting or rejecting VE proposals. The program responsibilities are as follows:

(1) The IHS Headquarters Director, Division of Facilities Planning and Construction and the Area Facilities Engineers, will monitor, manage, and maintain data for the VE program.

(2) The Division of Engineering Services is responsible for the performance of the VE analysis on Health Care Facilities Construction projects they manage.

23.3.5.4 Reporting.

(1) VE Reports - The team performing a VE analysis is responsible for developing all reports required to complete the VE.

(2) Annual Reports - Each year, DES and Area Office VE coordinators shall prepare a report on all VE activities for which they had lead responsibility. The responsible DES office or Area Office prepares a report summarizing the value engineering activities. This report should be submitted to IHS OEHE DFPC on December 1 every calendar year. The reporting requirement has two parts:

- Part I of the report asks for net life-cycle cost savings achieved through VE. If thresholds vary by category, agencies shall show the thresholds for all categories. Savings resulting from VE proposals and VE change proposals should be included under the appropriate categories.
- Part II asks for a description of the top five projects utilizing VE for the fiscal year. Agencies shall list the projects by title and show the cost savings, cost avoidances, and quality improvements achieved through application of VE.

For details on what this annual report should include, refer to Office of Management and Budget (OMB) Circular A-131.

End of Chapter 23.3 Value Engineering

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