

GAO

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Committee on Government Operations  
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VALUE ENGINEERING

Usefulness Well Established  
When Applied Appropriately

Statement of L. Nye Stevens, Director  
Government Business Operations Issues  
General Government Division



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VALUE ENGINEERING: USEFULNESS WELL ESTABLISHED  
WHEN APPLIED APPROPRIATELY

SUMMARY OF THE STATEMENT OF  
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OPERATIONS ISSUES

GAO has done considerable work on value engineering since the 1970's and recognizes the concept as a proven cost saving technique. As early as 1974, after reviewing value engineering activities at 10 federal construction agencies, GAO recommended that all federal construction agencies adopt value engineering programs. In 1984 GAO reported that greater use of value engineering had the potential to save the Department of Transportation 3 to 5 percent of project costs. GAO has consistently supported the use of value engineering when appropriate and believes that it can provide indisputable benefits in construction, weapons, and systems programs.

However, GAO has also emphasized that its use should proceed carefully, and that value engineering should be seen as one of many useful techniques for improving productivity and reducing cost, but may not be useful in every instance or for the program mix of every agency. A value engineering program should promote the effective use of value engineering but minimize the chance of money being wasted on unnecessary, unsuccessful, or inappropriate value engineering reviews. This would indicate retaining a degree of agency discretion and flexibility in its application.

Congress may want to await the issuance of a revised Office of Management and Budget Circular on value engineering, which is being strengthened, before deciding on H.R. 281. As an alternative, GAO recommends that the bill be amended to allow agencies to waive the requirements for value engineering reviews in appropriate circumstances.

Mr. Chairman, Mr. Horton, and Members of the Subcommittee:

We are pleased to be here today to discuss proposed legislation (H.R. 281) that would require value engineering reviews for certain types of federal contracts, titled the "Systematic Approach for Value Engineering Act." On September 25, 1990, we commented on H.R. 3404, a bill that was similar but not identical to H.R. 281 that is under consideration today.

H.R. 281 would require executive agencies to conduct a value engineering review for each federal government-sponsored construction contract or architectural or engineering services contract for a project in an amount over \$2 million and for each contract and certain subcontracts for procurement of major systems.<sup>1</sup> It would also mandate executive agencies to require states or local governments, as a condition of obtaining a grant, to require a value engineering review for each contract or subcontract resulting from a grant that meets these dollar criteria. The bill would also require the head of each executive agency to conduct a value engineering review of the agency itself, and to establish a "system" (as opposed to the "office" that H.R. 3404 would have established) to ensure that value engineering requirements are implemented and staffed with personnel whose responsibilities are dedicated exclusively to carrying out value engineering's objectives.

#### THE CONCEPT OF VALUE ENGINEERING

In general, value engineering is a systematic search for less costly alternatives to a proposed or the accepted way of doing things. Specifically, it is a process for evaluating 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 required performance, reliability, quality and safety. For example, a value engineering study could conclude that a different, initially more expensive heating system would be less costly over the life of the system because it was more energy efficient than a proposed system with a lower acquisition cost.

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<sup>1</sup>A major system is defined by Federal Acquisition Regulation as a combination of elements that will function together to produce the capabilities required to fulfill a mission need. The elements may include hardware, equipment, software, or a combination of the three but exclude construction or other improvements to real property. Further criteria denoting a major system depend on the type of agency and the estimated cost.

## COST SAVINGS PROVEN IN MULTIPLE REVIEWS

We have done considerable work on value engineering since the 1970's and recognize the concept as a proven cost saving technique. A list of some of the more important reports we have issued is attached to my statement. For example, as early as May 1974, after reviewing value engineering activities at 10 federal agencies with construction programs, we recommended that all federal construction agencies adopt value engineering programs (B-163762). In a 1984 report (RCED-85-14), we reported that greater use of value engineering had the potential to save the Department of Transportation 3 to 5 percent of project costs. We reported in 1985 that increased use of value engineering on wastewater projects could save EPA from \$25 million to \$57 million annually (RCED-85-85).

We also identified opportunities for expanding or improving the use of value engineering at the Department of Defense. In a 1977 report, we recognized the potential to further reduce costs on weapons systems acquisition by improving top management support for DOD's value engineering program with defense contractors (PSAD-78-5). In a 1983 report (AFMD-83-78), we noted that DOD had increased its management attention to value engineering and reported savings of almost \$145 million in fiscal year 1982. In another 1983 report, we found that although value engineering had reduced the Corps of Engineers' water resource construction costs by about \$566 million, greater savings could be achieved by applying value engineering to more project designs and by applying it earlier (RCED-83-127).

In short, we have consistently supported the use of value engineering when appropriate and believe that it can provide indisputable benefits in construction, weapons, and systems programs. However, we have also emphasized that its use should proceed carefully, and that it should be seen as one of many useful techniques for improving productivity and reducing cost, but may not be useful in every instance or for the program mix of every agency. In a March 29, 1989 letter to the sponsor of H.R. 3404, we cautioned that efforts to extrapolate cost savings based on successful application of value engineering in construction and major systems projects throughout the government would be problematic because of, among other things, the many variables in agency functions.

## CURRENT POLICY ALLOWS FLEXIBILITY IN FEDERAL AGENCIES' USE OF VALUE ENGINEERING

Both the Federal Acquisition Regulation (FAR) and the Office of Management and Budget (OMB) provide guidance on value engineering to federal agencies, with an emphasis on contracts and projects. The policies allow agencies some flexibility in the use of value engineering.

The FAR provides for two methods for value engineering. The first is an incentive approach in which contractor participation is voluntary. The contractor uses its own resources to develop value engineering change proposals. If the contracting agency accepts a proposed change, the contractor shares in future savings and is paid certain development and implementation costs. The second approach entails the government requiring and paying the contractor to perform value engineering efforts, which are included as separately priced work in the contract. With the exception of architect engineer contracts, the contractor also shares in savings resulting from accepted proposed changes, but at a lower percentage rate than under the voluntary approach.

FAR exempts some research and development, supply, service, and construction contracts from value engineering. They include: (1) contracts less than \$100,000, (2) engineering services from not-for-profit or nonprofit organizations, (3) certain product or component improvement contracts, (4) contracts or class of contracts which the agency head has exempted, (5) incentive-type construction contracts, and (6) personal services contracts. In general, these contracts are exempted because either they are considered inappropriate for value engineering, the cost of the study could outweigh expected benefits, or the government is already paying the contractors to make improvements and they should not be compensated twice for their efforts.

OMB, citing conclusions from GAO and Inspector General reports that greater use of value engineering would result in substantial savings to the government, issued OMB Circular No. A-131 on January 26, 1988. The Circular stipulates that agencies' value engineering programs encompass certain aspects, including: (1) a single entity to manage and monitor value engineering efforts, (2) a process that ensures that funds necessary for operating agency value engineering programs are included in annual budget requests, (3) a practice of actively eliciting value engineering change proposals from contractors, and (4) the use of FAR value engineering program requirement clauses in initial production contracts for major systems programs and for research and development contracts except where the agency determines that such use is not appropriate.

OMB is currently revising Circular A-131. However, we have not yet seen the revisions and thus do not know the nature or extent of the changes.

#### COMMENTS ON PROPOSED VALUE ENGINEERING LEGISLATION

Although our past work has demonstrated that value engineering can save money and should be encouraged, a value engineering review can be expensive and will not always recover cost. A value engineering program should promote the effective use of

value engineering but minimize the chance of money being wasted on unnecessary, unsuccessful, or inappropriate value engineering reviews. We are concerned whether H.R. 281 would allow managers sufficient flexibility in exercising discretionary judgment to assure the government's appropriate and successful use of value engineering.

Further, while value engineering can pinpoint ways to reduce overall costs, agencies may not have the initial funds available to achieve the savings. Along those lines, we testified in 1990 (GAO/T-GGD-90-54) that although technological and contracting advances have opened up possibilities of major savings in lighting costs, federal agencies were sometimes unable to take advantage of the potential opportunities because they lacked funding for investment in conservation technology.

We also believe that H.R. 281 may require agencies to apply value engineering when it may not promise savings or improved value. As a hypothetical example, a military construction agency might be tasked with designing and constructing a series of identical buildings nationwide, such as family housing. While value engineering would be useful for the design and construction of the initial unit, it is doubtful that comparable benefits would be achieved for the remaining units built.

Similarly, we question whether the concept of a value engineering review of an agency, as required in Section 4 of H.R. 281, should be imposed as a requirement in view of the uncertainty of the level or cost of such a review and because the agency may be using other operations improvement methods, such as Total Quality Management. Further, it is unclear whether smaller agencies, without construction or physical project responsibilities, would benefit from broad-scale and periodic reviews founded on the engineering discipline.

We are aware that value engineering is not being used to its fullest extent. Indeed, many of our past reports have recommended expanded use of value engineering in construction projects, in at least one case with lower dollar thresholds than specified in this bill. Because our budget process retains a short-term focus, some agencies perceive the process of value engineering as another function to fund with an already limited budget and thus do not implement the program. Within budget constraints, we believe that agency heads should encourage the use of value engineering, when appropriate, to reap needed benefits from savings resulting from value engineering. However, it may be appropriate to allow some flexibility in requiring value engineering reviews.

While we do not know the extent of the revisions to OMB Circular A-131, we understand that it is being strengthened. Congress may want to await the issuance of these revisions before deciding on

H.R. 281. As an alternative, we would recommend that the bill be amended to allow agencies to waive the requirements for value engineering reviews in appropriate circumstances.

This concludes my prepared statement, Mr. Chairman. My colleague and I will be pleased to answer any questions.

(240101)

List of GAO Reports and Testimonies  
Relevant to Value Engineering

Navy Office Space: Cost Estimate for Consolidating the Naval Systems Commands May Be High (GAO/GGD-91-61, Mar. 8, 1991).

Barriers to Installing Energy-Efficient Lighting in Federal Buildings (GAO/T-GGD-90-54, July 11, 1990).

Greater Use of Value Engineering Has the Potential to Save Millions on Wastewater Treatment Projects (GAO/RCED-85-85, July 16, 1985).

Information on the Use of Value Engineering in Federal Design and Construction (GAO/GGD-85-44, Apr. 5, 1985).

Greater Use of Value Engineering Has the Potential to Save the Department of Transportation Millions in Construction Costs (GAO/RCED-85-14, Nov. 2, 1984).

Value Engineering Should Be Improved As Part of the Defense Department's Approach to Reducing Acquisition Costs (GAO/AFMD-83-78, Sept. 27, 1983).

Improvements Needed in the Air Force's Design Process for Military Construction Projects in Europe (GAO/NSIAD-83-21, July 19, 1983).

Improvements Needed in the Army's Design Process for Military Construction Projects in Europe (GAO/NSIAD-83-22, July 19, 1983).

Water Resource Construction Costs Could Be Reduced if Value Engineering Were Applied to More Designs and Applied Earlier in the Design Process (GAO/RCED-83-127, May 11, 1983).

Value Engineering Has the Potential to Reduce Mass Transit Construction Costs (GAO/RCED-83-34, Dec. 29, 1982).

Potential Exists to Reduce Construction Costs Through More Effective Promotion of the Value Engineering Incentive Program (Letter to the Commissioner, Bureau of Reclamation, Dec. 1, 1982).

Potential of Value Analysis for Reducing Waste Treatment Plant Costs (RED-75-367, May 8, 1975).

Need for Increased Use of Value Engineering, a Proven Cost-Savings Technique, in Federal Construction, (B-163762, May 6, 1974).