

**U.S. DOT Federal Railroad Administration
Office of Passenger and Freight Programs**

Monitoring Procedure 30 – Value Engineering Review

1.0 PURPOSE

This Monitoring Procedure describes the Monitoring and Technical Assistance Contractor's (MTAC) review of the Grantee's Value Engineering (VE) practices, particularly the Grantee's success in identifying scope that could be done more efficiently for equal or less cost; and success in the weighing long- and short-term value (quality/capacity) against long- and short-term cost.

2.0 KEY PRINCIPLES

The optimal point to conduct VE is half-way to three-quarters through Preliminary Engineering, when design criteria are developed, capacity/operational analyses are complete, and the implications of the infrastructure schematic design are becoming clear. This timing works for all project delivery methods.

Value engineering requires a systematic process applied by a multidisciplinary team. One core objectives of VE is to improve communication among involved parties. VE is particularly valuable when a project involves numerous stakeholders. Improvements in communication alone can make the VE effort a success.

3.0 REQUIRED DOCUMENTS

The MTAC should obtain the following project documents from the Grantee before performing the VE review:

1. Value Engineering Work Plan including disciplines and hours for the analysis
2. Orientation memorandum including logistics, assumptions, any scope limitations of the study, and cost models
3. When the MTAC has not been able to attend the workshop: VE reports indicating the disposition of VE recommendations (accepted, discarded, held)

4.0 SCOPE OF WORK

4.1 MTAC Oversight

1. The MTAC shall evaluate the Grantee's Value Engineering (VE) program to assess the efficacy of the process and quality of decisions weighing long- and short-term value (quality/capacity) against long- and short-term cost. The MTAC will evaluate using the SAVE Standard, the Value Standard and Body of Knowledge, June 2007 (or the latest edition,) by SAVE International. Refer to <http://www.value-eng.org/>
2. The MTAC should attend the VE workshop if possible.
3. The MTAC will confirm that the Grantee's VE program accomplishes the following:
 - a. The design information supplied is sufficient to conduct the VE study and includes:
 - i. A complete cost estimate following the plan set reviewed

- ii. Design memoranda for key disciplines
- iii. Design criteria
- iv. Plan set and specifications at Concept Design (10 percent) or Preliminary Engineering (30 percent)
- v. Environmental documents
- vi. Milestone schedule
- b. The team is multidisciplinary, independent from the project team, and qualified to conduct the study
- c. The Final VE Report includes the disposition of each recommendation – rejected proposals are based on reasonable criteria; accepted proposals are incorporated into the revised project documents and tracked in configuration control

4.2 Grantee's VE Program

The Grantee should build the VE effort into the project schedule so that adequate time is allowed for preparation, the Workshop, and recording of decisions / disposition of VE recommendations.

4.2.1 Pre-Workshop

1. The Grantee prepares for the VE study. Typical activities include:
 - d. Obtain management support for the VE.
 - e. Select appropriate VE workshop participants.
 - i. Altogether they should represent the many disciplines required to develop, deliver, and operate the project/service; they should understand the functions with the greatest impact on cost, operability and risk.
 - ii. Invaluable to the effort are outside "peer experts" -- technical, managerial, and operational – who will take time to study the project and its trade-offs.
 - iii. Also key to the VE workshop success is participation by project leadership and staff. Agency leadership should attend the final presentation of VE recommendations.
 - f. Develop the scope of work and objectives for the study; develop a work plan; define logistics for the workshop, and distribute all to the team
 - g. Collect and transmit the project support memoranda, plan set, draft specifications, project schedule and capital cost estimate

4.2.2 Workshop

The Grantee's facilitator takes workshop participants through the following steps:

1. **Information Gathering** - The team reviews and defines the current conditions of the project and identifies the goals of the study.
2. **Function Analysis** - The team defines the project functions, and evaluates them for improvement or elimination, or if new functions are needed to meet the project's goals. The team considers the cost-to-worth ratio of the project's basic and secondary functions:
 - h. Cost-driving design criteria and functions
 - i. Marginally justified support functions

- j. Project elements that have poor cost to worth relationships
 - k. Schedules that maximize the time-value of capital investment
3. **Creativity** - The team brainstorms other ways to perform project function(s).
4. **Evaluation** - The team follows a structured evaluation process to select ideas with the potential for value improvement that comply with the project's function(s) and take into account performance requirements and resource limits. The team consider important tradeoffs:
- l. Cost vs. flexibility, redundancy, convenience
 - m. Cost savings and innovation vs. agency risk
 - n. Initial capital savings vs. operational cost
 - o. Potential inefficiencies of phased construction vs. cash flow
5. **Development** - The team develops the selected ideas as alternatives (or proposals) and provides sufficient documentation to allow decision makers to decide if the alternative (or proposal) should be implemented. The team makes recommendations.
4. **Presentation** - The team leader writes a report and/or presentation that shows the team's recommendations and associated value improvement opportunity.

4.2.3 Post-Workshop

- 1. The Grantee's leadership confirms the disposition of the accepted VE recommendations.
- 5. The Grantee implements changes to the project documents (drawings, cost estimate). Changes are tracked in the Grantee's Project Configuration Management process.

5.0 REFERENCES – SEE MP 01