

**Raytheon Engineers &
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The Antidote to Value Engineering Phobia

Farid Fam Mansour, PE, CCE, CVS

Allen James Hulshizer, PE, FASCE

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Farid Fam Mansour, PE CCE, and Allen James Hulshizer, PE

The basic engineering population is comprised of well-trained, highly-motivated, objective individuals who pursue their task to develop concepts, projects, equipment, etc., with rigor, determination, and pride. Although bound by many constraints and obstacles, they strive to complete their task and most often experience a great sense of accomplishment. When the suggestion of value engineering (VE) for their task is thrust upon them, many designers consider it a potential threat that could fly in the face of their efforts, question their virtues, and challenge their expertise. Herein lies the insidious germ, which is capable of developing into "value engineering phobia" (VE phobia).

VE phobia is not restricted to the engineering efforts in the trenches; it has its place in the supervisory arena also. Tight competitive budgets and schedules put heavy pressure on management to control and deliver within dictated confines. Fast-track projects only add more to the envisioned problems. This raises the following question: will VE alterations impact the cost and production of the deliverables I am responsible for, and if so, how will it reflect on me?

The savings accumulate, but independent of engineering budgets, in the owner's or contractor's bank account. What relevance will be recognized with regards to my part of the project engineering portion when the originally assigned engineering budget and schedule targets are missed? This reasoning is not based on greed, but on fear. The question is then raised regarding the implementation of VE. What's in store for me? What good can result? And from deep inside comes the sickening feeling that only negative results can occur.

Every fear creates a defensiveness to protect from whatever "attacks" the worth or security of a person. As such, VE can be perceived as an enemy to discredit. This develops into a culture of distrust, evasiveness, protectionism, and an underlying adversary relationship, which is counterproductive to the objective role of VE. To deny the reality of the VE phobia potential is to deny human nature and to ignore the availability of antidotes that are available to mitigate detrimental aspects so that VE can achieve its highest potential.

The discussion here is basically related to the engineering and construction industry; however, its principles are just as applicable to most industrial operations.

VE AS ENVISIONED BY UPPER MANAGEMENT

Management's reason for implementing VE is to ferret out inefficiencies, introduce alternative concepts, give creative insights, and provide innovative improvements—all with the goal to reduce cost,

accelerate the schedule, and improve quality. As envisioned, it is expected to blend harmoniously, without disruption of the project work flow, with the high goal of being a profitable enterprise. All that is needed is to bring together the select VE team, introduce them to the project personnel, and watch for the improvements to happen. Only good results are anticipated.

In summary, the upper management recognizes that VE is an organized technique to detect deficiencies and/or alternatives that can change the existing design approach in order to realize lower cost and/or schedule improvements. In some cases, product improvement may be achieved at the same cost or even lower. They also realize that almost always the owner and/or a fixed-cost contractor are the beneficiaries, with possibly some shared cost savings with the VE development management. It is safe to say that rarely, if ever, will the originating design team realize any financial gain or prestige.

VE AS PERCEIVED BY THE AFFLICTED

To the uninitiated, VE is perceived as already being implemented as part of a routine project development and checking process used to verify the accuracy of the original design work. Those involved consider that the expertise of those directing the project development comes to play during the design process and that the design team has given reasonable, in-depth thought into the organization and selection of the project components, layout, and materials. The assignment of the project design team is logically based on the consideration that its members are competent, dedicated, and fully capable of achieving the most cost-effective, functional final product.

The introduction of an independent VE team still requires the involvement of knowledgeable project personnel to explain the project objectives, background, initial directives, directions taken, and the considerations involved. This event usually occurs a little while into the project development, and in a highly-competitive market, very little time or budget are available to free personnel to help critique the implemented design, let alone to revise it. VE, as offered for improved value, generates very little interest to project design personnel since there are no apparent personal advantages, and as such, it will seldom be requested by those responsible for project engineering budgets and completion schedules. VE, for the most part, is imposed by company officials, client requirements, or government regulations and received as an affliction by those responsible for seeing the work through. This "affliction," real or perceived, produces a real mental disturbance, and in the case of VE, VE phobia.

SOURCE OF VE PHOBIA

As is the case in any disorder, it is important to determine the root cause(s) of the malady in order to be able to prescribe the proper remedy. The basic source of VE phobia lies in a lack of confidence in the managerial abilities of those implementing the VE, augmented by feelings of inadequacy. These uncertainties may not be not altogether imagined and generally develop in an environment where people perceive that there is a lack of appreciation and recognition of their contributions. These feelings are bred from observations of apparent indifference to those who actually saw the job through and the "declaration for all those who took no part." After all, who gets to go to the ribbon cutting ceremony? Certainly there is a conducive atmosphere for the incubation of distrust in a nation where even staid and established organizations have succumbed to downsizing.

Distrust is communicable, and individual demoralization and mistrust can easily spread to others where there has been no active efforts to immunize the populous against its infectious wiles. Given these suspicious conditions, the VE team is dropped from heaven, perceived by the afflicted to be a gift to management. The design team, in its suspicious condition, has its VE phobia easily fortified, perceiving that VE will show its efforts to be substandard, not well-thought-out, superficial, narrow, not up-to-date, uncreative, etc. For this anticipated VE diagnosis, the design team suspects that it will not be deemed highly competent or proficient, and therefore, not highly regarded for this or future assignments. This augmented phobia will always work against achieving the real benefits of VE. When VE benefits are not realized, VE is given a bad name and is not viewed favorably for future projects. As has been alluded to previously, all VE phobias are not unjustified, which gives more credence to the perception.

An antidote must be applied to benefit both the project personnel and those who have the most to gain by a cooperative team approach to VE. The remedy is not a short-lived financial placebo.

CURE VERSUS PREVENTION

Cure

To cure a condition requires restoration, which means that some degree of harm and degeneration has occurred, which also means that there has been some degree of loss that cannot be recovered. From an efficiency standpoint, waiting for an illness to occur and then administering a cure is not the healthiest approach. Certainly there is the risk that the cure might be too late and that the patient may die or become permanently incapacitated to some degree or another. In the case of VE phobia, the application of a cure may only be a partial corrective measure because design teams are not made up of the same personnel for following projects. If that is the case, there is always the situation where the rehabilitated individual can be reinfected by those who are already contaminated by VE phobia. VE phobia is an experienced and/or a prejudiced impairment of distrust and is not easily offset by a low dose of cure rubbed off of a restored design team member from another group.

A cure is a correction to an already existing condition. Curing, while it is not the most positive or efficient approach, is certainly recommended for working toward developing a healthy atmosphere for an effective VE operation. Doses of the appropriate antidotes should still be given to strengthen the project body and offset the potential for future infections.

Prevention

To prevent is to anticipate a problem and to take advance measures so as to keep unwelcome disease or destructive malignancies from occurring, or at least greatly mitigating their effect. Prevention requires forethought to avoid the necessary but unwelcome or disagreeable actions or measures. Preventive measures are needed to offset the introduction of an abnormality that will become destructive if allowed to fester. It has been well said for many years that, "an ounce of prevention is worth a pound of cure," and in some cases it could be worth tons of cure, or even worse, the cure may be too late.

Prevention is certainly the healthiest and most efficient approach to heading off personnel misunderstandings that lead to distrust, disillusionment, frustrations, lack of confidences, etc. (i.e., VE phobia), all of which are impediments to achieving the potential gains to be derived through the implementation of value engineering. A preventative antidote is the answer.

THE VE PHOBIA ANTIDOTE

Definition

An antidote is a remedy to counteract the effects of poison—something that relieves, prevents, or counteracts. As with any preventive medicine, it is derived on the basis of knowing what produces the disease and what will immunize the individual against the development of the pernicious, destructive, injurious, and debilitating conditions.

Impairment Defined

Throughout this discussion on what produces VE phobia, words like "envision," "apparent," and "perceived" have been used to describe its development and condition. All of these words describe a condition of mind that is based on conjecture, which can be fortified by a prejudice against incidental happenings. Left uncorrected, they become pernicious, very factual, and very real. Each occurrence of a perceived attack on the security and competence of the person adds more reason to be protective and to build stronger defenses. Fear immobilizes, breaks down communications, and mitigates against the cooperative atmosphere that is necessary to achieve the highest potential from the implementation of a value engineering process.

Antidote Prescription

It is to this contagious condition of mistrust, suspicion, intimidation, and uncertainty to which the VE phobia antidote against fear must be developed and applied. In simplicity, what is needed is the establishment of trust and confidence built on good, trustworthy, factual information that is applied at a time when it will vaccinate the design team against VE phobia infection. This will show that personal gains are available and can be achieved by the active, cooperative participation of design team members.

Antidote Ingredients

One of the most important ingredients to offset misunderstanding is to plan ahead and introduce value engineering to the project supervision and design team at the start of the project. This introduction should include the goals of VE, establish a budget and schedule allowance, and definitely describe how the participating design team members will personally benefit by being involved in VE. Some of the benefits to be emphasized are as follows.

1. Impress strongly that it is understood that no one person "knows it all." VE alternative suggestions and recommenda-

tions are based on VE and design team cooperative efforts and will not be viewed as deficiencies against the design originators.

2. Since project teams usually "hit the ground running," it is recognized that schedule pressures can easily result in "tunnel vision," unless there are techniques like VE implemented to assure that the original criteria constraints and directions are still valid.
3. "Hindsight" is available when there is still time to implement changes.
4. The participation of the design team members can have significant personal benefits for some of the following reasons:
 - the exposure to new "experts" or levels of expertise will allow for access to new information, methods, materials, concepts, etc., that are not normally available;
 - the involvement will be in effect "lessons-learned," an educational activity;
 - the opportunity to express personal insights on other ways to develop the work;
 - the opportunity to avoid being stuck with just doing it the same way as the last job;
 - recognition of savings that are the results of the design team's efforts; and
 - confirmation that the original design was (generally) well-thought out and commendable.

The net result of being exposed to and participating in the VE effort is to actually improve one's engineering knowledge, qualifications, capabilities, proficiency, resources, etc., which will, in effect, make those participants better qualified and more valuable to the organization for succeeding projects.

The antidote message is that VE is beneficial to the design team and that its contribution is encouraged and valued, and no matter what changes or what improvements are made to the original work, members of the design team are still recognized as valuable organization team members.

This presentation covers the human factors involved in relationships between management, the VE team, and the design team, which need to be addressed to allow VE to achieve its goals. The discussion provides a basic prescription to avoid or cure the natural phobia developed by the intrusion of a "swat team" of questioning VE team members.

Critical to the success of the antidote is that it not be offered or applied unless there is the intent, determination, and means to see that what is promised by management is in fact carried out. If there is no consistency between the promise and reality, then greater mistrust will develop, and the remedy proposed for a healthy relationship will actually result in increased VE phobia.

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Farid Fam Mansour, PE CCE
Raytheon Engineers & Constructors, Inc.
30 South 17th Street
Philadelphia, PA 19101-8223

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Philadelphia, PA 19101-8223

