

VE IN DISASTER RECOVERY



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ABSTRACT

VE can play an important role in disaster recovery, although an emergency environment alters many of the assumptions about how VE operates. First, priorities and tasks change as cost becomes less important than safety and security. In an emergency, schedules are telescoped. Among useful VE tools, cost analysis is less important than risk analysis and schedule risk analysis. This paper illustrates VE's usefulness in disaster recovery of the World Trade Center.

New Jersey, which operates the WTC. At the time of the bombing, I was putting together a VE workshop on the WTC public space master plan under the direction of Bob Harvey who was Manager of the Office of Capital Programs and Director of Value Management (VM) at the Port Authority.

In the days after the bombing, I was asked to join what became a \$300 million dollar push to reopen the WTC as quickly as possible. In the process, I learned new things about the nature and potential of VE. I saw how effective VE can be in solving short-and long-term problems during an emergency. I also saw how an emergency environment changes many of the assumptions about how VE operates.

INTRODUCTION AND BACKGROUND

As value engineers, we take certain things for granted when we work on a study. We know the time frame, the cost estimate, and the organizational structure we are dealing with. We know that, aside from site visits, we will spend most of our time in an office or conference room with basic amenities. And we certainly know the design concept we will be working on. In disaster recovery, none of these things may be true.

I'd like to share my observations about the characteristics of VE during disaster recovery, looking especially at priorities and tasks, timing, workshop teams, methods, and reports and follow-up. Although the experiences I describe resulted from a terrorist attack (and CIA Director John Deutch's recent prediction of a surge in terrorism shows that the threat continues), the lessons I learned can be applied to recovery from natural disasters or disasters caused by human error. The more we know about the nature of VE in an emergency, the more effective we can be when called upon to help.

My experience with disaster recovery came when I led a value management team as part of the recovery effort after the World Trade Center (WTC) bombing. My company, Project Management Services, Inc. (PMSI), held an open-ended VE contract with the Port Authority of New York and

PRIORITIES AND TASKS

VE priorities change during an emergency such as the WTC bombing. In ordinary circumstances, clients use VE to uncover cost savings while improving value. In a disaster, other priorities may

come before cost, including safety, security, schedules, reassuring tenants or the public, speedy recovery, and planning what to do with areas that have been destroyed.

VE tasks in an emergency are of two kinds: solving short-term tactical problems and setting long-term strategy. David Kirk of the Port Authority engineering department at the time of the WTC bombing, gave an example of a short-term problem. "We discovered that after the late March opening of the World Trade Center, there would be no cooling system available for the approximately 200 tower elevator motors. In a one-day VE workshop, a team developed an ingenious solution: cross-connect the domestic water line with the cooling coils of the mechanical equipment room's air handling units using the Tower's fire stand pipe system" (Kirk 4).

The long-term strategy tasks at the WTC focused on three areas: engineering, including technical issues related to recovery; space planning; and security, including integrating new security measures into ongoing renovations. One strategy team, charged with looking for additional emergency power sources, recommended connecting the WTC to a New Jersey source by way of lines run through railway tunnels.

TIMING

An obvious difference between standard VE and VE in disaster recovery is timing. As Bob Harvey explains, "The uniqueness of the challenge that faced us in February, 1993 relates to the fact that it typically takes years to plan and develop a \$300 million project." In an emergency, everything is telescoped.

I received a call from the WTC on Friday asking me to assemble a 25-person VE team to meet in New York by the following Wednesday. Putting together such a team usually takes weeks. I had to quickly decide what experts we needed, network to find them, and ask them to clear their calendars. Fortunately, they were more than willing to participate.

Workshop time was compressed, ranging from 3 days to as little as 4 hours, with daily WTC coordination meetings at 7:30 am and progress meetings at 6:30 pm, 7 days a week. Bob Harvey conducted six 3-day strategy workshops which followed an accelerated version of the traditional VE process. At the same time, on-site VE teams and ad

hoc groups worked continuously on short-term tactical problems. In such an environment, VE facilitators could not conduct business as usual - these were not standard 40 hour workshops with another 40 hours for the report. Facilitators had to be fast, flexible, and decisive.

WORKSHOP TEAMS

Aside from differences in tasks and timing during disaster recovery, there were changes in the composition and operation of the multi-disciplinary VE teams. Normally, teams are made up of "outsiders," i.e., professionals who are expected to bring expertise, an objective viewpoint, and new ideas to a project. During the WTC emergency, however, teams working on long-term strategy were approximately half outsiders and half Port Authority insiders. Teams working on tactical, short-term problems were primarily made up of insiders, including engineers, architects, technicians, and others familiar with the buildings' design and operation.

According to David Kirk, one key facilitator approached tactical problems by using a suggestion box to gather "hundreds of ideas from anyone who was willing to contribute - from the executive director to the clean-up crew" (Kirk 4). In disaster recovery, the knowledge and experience of insiders is invaluable.

Team members working on strategy issues met first in a make-shift workspace set up in the ballroom of the Vista Hotel. Later, we were among the first people allowed back into the Towers. Because we were not part of the original recovery team that had been working 16 hours a day for weeks, we were comparatively fresh and I believe this contributed to our effectiveness.

There was camaraderie among team members, a great sense of accomplishment, and a desire to pitch in. One expert, who solved a particularly difficult problem, told me she would receive \$3,000 for work normally valued at \$50,000. However, team members also felt anxiety due to the pressure of work, the enormity of the issues, and - for those of us working on strategy - the sense that everything done might be scrutinized by the press, accountants, and lawyers. Teams working on short-term tactics felt less of this last pressure since there is a generally forgiving attitude toward actions taken immediately after a disaster.

METHODS

The VE job plan offered a logical, workable structure for disaster recovery. The information, function analysis, brainstorming, evaluation, development, and presentation phases led to effective solutions for short-and long-term problems. However, in the WTC emergency, the job plan's implementation differed at times from the traditional approach, depending on the project. Fast tactical problem solving required shortcuts, and function analysis was given priority. Strategy problem solving, on the other hand, was most successful when the job plan was followed exactly. For example, by strictly prohibiting the evaluation of ideas during the brainstorming phase, we avoided time-consuming digression and kept team members focused.

When solving either short- or long-term problems, an effective VE tool was multi-attribute decision analysis (MADA), which is one version of the Method of Paired Comparison. During normal VE studies, MADA is often deemed too time consuming and dropped. Ironically, in one critical four-and-a-half-hour workshop at the WTC, MADA was a central decision-making tool used to integrate qualitative criteria and save time.

Another effective method in disaster recovery is risk analysis, including schedule risk analysis. David Kirk has described the general integration of risk management in VE (Kirk 62). In the WTC recovery effort, there were ample scheduling and risk data to analyze. The technique of cost risk analysis on initial construction costs, which is often used in regular Port Authority VE, was less important here since cost saving was not a top priority and cost data were generally not available. In some cases, cost risk analysis was later done on programs coming out of the recovery workshops.

REPORTS AND FOLLOW-UP

The most important difference between a traditional VE presentation and an emergency one is the emphasis on recommendations rather than alternatives. Following the WTC disaster, decision-makers had little time to consider options or read lengthy reports. They wanted to know what would work best.

When solving short-term tactical problems, facilitators may have been tempted to give only oral reports since speed was important and documentation

was difficult. However, as in any VE study, results were communicated most effectively and carefully in writing. Written reports on strategy issues for top management had to be short, to the point, and clearly written so that non-technical decision-makers could fully understand the VE recommendations.

Because of the speed of emergency VE, teams had to continue looking at issues after a presentation was made. We considered new information, fixed mistakes, took changing priorities into account, and rethought recommendations.

CONCLUSION

In many ways, VE in disaster recovery recalls the first uses of VE in World War II industrial procurement. Lawrence Miles, founder of VE, was a purchasing engineer at GE and had the task of finding vital, scarce materials for the manufacture of B-24 and B-29 aircraft. He worked in an atmosphere of urgency; cost was not a major priority, but it was essential that he complete his task. Rather than search unsuccessfully for products, he converted products to functions and found that, one way or another, he could purchase what he needed.

Miles used VE to speed up processes and solve problems in an emergency environment. While modern VE is sometimes considered too time-consuming to use, it actually began as a way to save time. In disaster recovery, it serves that purpose again.

After the WTC bombing, VE proved to be fast, adaptable, and effective. Teams were flexible, using different skills, job plans, and techniques depending on whether tactical or strategy issues were involved. Workshops quickly solved an enormous range of problems, and the VE process provided an overall framework for handling the emergency. In responding successfully to one of the worst terrorist attacks in American history, VE demonstrated its vital role in disaster recovery.

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This article was co-written by Janet Gallant.