

# Society of American Value Engineers

Committee on Technological Advancement

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## MEMO TO SAVE AUTHORS

The SAVE National Board and its Vice President for Professional Development, R. Dayrel Anderson have initiated a vigorous effort to identify and promote Technological Advancements to the Value Analysis process.

As a starting point, we have chosen to identify and promote those advancements represented in the papers published in SAVE National Proceedings since 1970. The questionnaire on the reverse of this letter refers to a paper or papers presented by you. Please expand upon each answer, using as much additional paper as you think appropriate.

Also enclosed for your information is a complete listing of the 56 papers since 1970 which are judged to contain "Technological Advancements"

The next step may be the offering of the listed papers for sale by the National SAVE Business Office, or it may result in the publishing of a SAVE Compendium. These matters will be faced when all the data is in.

A key reason for this review is to develop a basis for continuously motivating others to share their significant developments with their fellow SAVE members. Plans for this effort are under consideration, but will also be faced when all the data is in.

Thank you for your cooperation

A handwritten signature in black ink that reads 'Ted Fowler'.

Theodore C. Fowler, CVS(L), FSAVE

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## Questionnaire

A number of the papers published in the Annual Proceedings by SAVE since 1970 have been selected as containing Technological Advancements to the Value Analysis process. Your paper, as listed below, is included. Many of these papers have been overlooked by the Value Analysis profession. The SAVE Board has requested that a method be developed to disseminate this sort of information. This questionnaire is the first step in this process.

You are the author of the below-listed paper. Please respond as broadly as possible to the questions. Do not limit your comments to this rather constraining form.

**PAPER TITLE:** *"The Development of an E&F Compliance Action Plan Using Management Oversight, Risk Tree Analysis and Function Analysis System Technique"*  
*by James R. Wixon*

**PUBLISHED:** SAVE Proceedings, 1992 Annual International Conference

(1) What do you regard as the key message in your paper?

(2) How broadly is this message being applied in the Value Analysis of today?

(3) Why?

(4) What actions should be taken by SAVE to expand your message?

(5) Additional Comments:

Please return questionnaire to TC Fowler, 5113 Weddington Drive, Dayton, OH, USA 45426 (513) 837-6523

October 23, 1992

Society of American Value Engineers  
Committee on Technological Advancement  
Theodore C. Fowler, Director  
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Dear Sir:

I would like to thank you and your committee for choosing my paper "The Development of an ES&H Compliance Action Plan Using Management Oversight and Risk Tree Analysis and Function Analysis System Technique" to be among those papers since 1970 as containing technological advancements to Value Analysis process. I am greatly honored and appreciate the recognition very much. Below is my reply to your questionnaire about the paper:

(1) What do you regard as the key message in your paper?

ANS: I believe the key message in my paper is two fold. First, it is extremely important to identify the true problem and root cause(s) of that problem that a VA/VE team is trying to solve early in the information phase of the job plan, before performing function analysis and FAST. Next, by turning this root cause into a positive statement transforms it into the higher order, or objective function to be addressed in FAST.

The second message in my paper is that the VA/VE methodology is a powerful methodology for developing action plans to improve any product, process, or service. However, without focusing on the root cause(s) of the problems the team is trying to solve with the VA/VE methodology, the results of a VA/VE workshop are jeopardized. This is because the team may be focusing only on the symptoms of the real problem, or not the true problem at all.

There are numerous root cause analysis techniques that have been developed such as Ishakawa, or fishbone diagrams (Cause and Effect Diagrams), MORT, Kepner-Trego Problem Analysis, and Events and Causal Factor Analysis to mention a few. The TQM methodology emphasizes the importance of determining the root cause(s) of the problems in order to ensure the systemic, underlying causes are solved. The VA/VE methodology is the best method for resolving the root cause(s) once they are identified by creating a comprehensive action plan for improvement.

(2) How broadly is this message being applied in the Value Analysis of today?

ANS: I am not sure that is being applied extensively. I do know that some Value practitioners (Kaufman and Carter) do a short root cause determination prior to FAST modeling by asking the three questions, "What is the problem we are here to discuss", "Why do you consider this is a problem", and "Why do you believe a solution is necessary?" This, at a minimum, focuses the teams attention on the true problem and possible causes. Jerry Kaufman in his book Value Engineering for the Practitioner states that "it is important that they (the team) agree to the statement of the problem under study because:

- A. A common objective, direction, and level is necessary to keep the team on the problem rather than on its peripheral effects.
- B. If properly developed, the higher order and basic functions of the problem are contained with in the statements. These can be identified by underlining the verb and noun in the problem description.

The second question, "Why do you consider this a problem?" serves two very important purposes. 1) The probable causes of the problem are explored as well as prioritizing the need for the solution, and 2) The WHY in the question is also a direction (<----). Therefore, by extracting the functions from the answers, the higher order and basic functions selected by the first question can be tested.

The answers to the third question "Why do you believe a solution is necessary?" should support, add to, or modify the answer(s) to the second question as well as develop further functions to explore."

This successive questioning of "Why" is the same basic questioning used in root cause analysis. Somewhere it has been said that you don't really understand a problem until you answer the question "Why" at least five times. The answers to this question keep driving the problem in the "Why" direction on the critical path until you reach the objective function, which corresponds to the root cause of the problem.

(3) Why?

ANS: I'm not sure why it is not used more extensively. I have attended 40 hour workshops held by several different practitioners. Kaufman and Carter are the only ones I have seen that use any root cause analysis technique. Others may use a similar technique, but I am not aware of any.

I feel that it is extremely important to explore the root causes of the problem you are trying to model with FAST prior to function analysis and FAST. This is not to say that an extensive root cause analysis can't be performed separately from the VA/VE workshop, and the root causes brought to the session to be solved.

However, I think that in either case, a team approach to root cause analysis such as Cause and Effect Diagramming, Kepner-Trego, or some other methodology using the same interdisciplinary team should be used to both develop the root causes and participate in the VA/VE workshop. This will go a long way to building the team and understanding of the problem(s) at hand.

In the case of the Tiger Team audit at the INEL, there were so many problems identified that numerous techniques such as Pareto, MORT, and even a data base was developed to group, categorize and manage the problems. However, after an extensive root cause analysis, eight systemic problems were identified that embodied all of the Tiger Team findings. An objective function was developed from these eight key root causes, and then FAST was performed to develop a structure for the corrective action plans.

(4) What actions should be taken by SAVE to expand your message?

ANS: I believe that root cause analysis should be added to the VA/VE vocabulary and that it should be a part of the information phase of the job plan just as FAST is and be performed prior to FAST. At a minimum, the three questions Kaufman and Carter use should be stressed. Also, if a separate root cause analysis is performed prior to the VA/VE workshop, it should be performed by the same team that participates in the workshop.

#### DEFINITIONS

- **ROOT CAUSE:** The most basic deficiency that if, corrected, will prevent recurrence of a problem. When turned into a positive statement of the cause to the problem, the root cause becomes the higher order, or objective function of a FAST model from which the basis, and scope of the FAST model is determined. The FAST model will answer the question, "How do we accomplish this objective, thus, solve this problem?"
- **ROOT CAUSE ANALYSIS:** An analysis to determine the most basic cause(s) of a problem or deficiency.
- **ACTION PLAN:** A plan that prescribes activities, responsibilities, schedule and budget to improve performance by resolving the root cause(s) of the problem or deficiency, and accomplish the objective, or higher order function. This is the result of the VA/VE workshop to be implemented by management.

5) Additional Comments:

Somehow, in the editing process of my paper the one figure was left out and another one was out of order. The wording is OK, but the figures don't match the words. If possible, I would like to work with Jim Vogl to correct the paper.

Thank you again for selecting my paper. If there is anything more you would like to know, I will be happy to answer your questions.

Sincerely,

A handwritten signature in cursive script, appearing to read "Jim Wixson".

Jim Wixson, CVS