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*V. L. Birkland*

V. L. Birkland

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# APPLYING VALUE ENGINEERING AND MODERN ASSESSMENT TOOLS IN MANAGING NEPA

## IMPROVING EFFECTIVENESS OF THE NEPA SCOPING AND PLANNING PROCESS

Charles Eccleston, Waste Management Federal Services of Hanford, Inc.

### ABSTRACT

While the *National Environmental Policy Act (NEPA)* implementing regulations focus on describing "what" must be done, they provide surprisingly little direction on "how" such requirements are to be implemented. Specific implementation of these requirements has largely been left to the discretion of individual agencies. More than a quarter of a century after NEPA's enactment, few rigorous tools, techniques, or methodologies have been developed or widely adopted for implementing the regulatory requirements.

In preparing an *Environmental Impact Statement*, agencies are required to conduct a public scoping process to determine the range of actions, alternatives, and impacts that will be investigated. Determining the proper scope of analysis is an element essential to the successful planning and implementation of future agency actions. Lack of rigorous tools and methodologies can lead to project delays, cost escalation, and increased risk that the scoping process may not adequately capture the scope of decisions that eventually might need to be considered. Recently, selected *Value Engineering (VE)* techniques were successfully used in managing a prescoping effort. A new strategy is advanced for conducting a pre-scoping/scoping effort that combines NEPA with VE. Consisting of five distinct phases, this approach has potentially wide-spread implications in the way NEPA, and scoping in particular, is practiced.

### INTRODUCTION

Little more than two centuries ago, a scoping process was conducted in the young, but rapidly expanding metropolis of Philadelphia, Pennsylvania. Here, an interdisciplinary team of 55 highly capable men, experienced in diverse aspects of planning, management, and operations, assembled to evaluate alternatives for revamping an unworkable management and operations system. As part of this planning analysis, a number of contemporary issues potentially having significant repercussions were evaluated. Rigorous procedures were established to ensure consideration of all points of view. As part of any well-coordinated and systematic pre-scoping effort, the team screened an array of potential courses of action before formulating a proposed action.

Scoping committees were established to identify a range of actions, alternatives, and potential consequences that would need to be considered before a final decision was reached. In reviewing the diverse range of issues and problems, it became clear that a new, perhaps even radical, approach would be required for addressing existing problems. While a proposal was soon crafted, planners exercised prudence in ensuring that all reasonable alternatives were given full, fair, and

substantial inquiry. On completing the scoping process, issues were evaluated in detail by an interdisciplinary group of experienced analysts. Rigorous reviews and lively debates ensued. Systematic procedures were employed for incorporating comments and reaching a final decision. On completing the planning process, a document was prepared to record the final decision. Eventually, decisions resulting from this planning effort would reverberate around the world.

Today, the American Constitution stands as a testament to prudent, well-ordered planning. The importance of conducting an effective scoping process is as true in this day and age, as in our forefathers. Perhaps no other single concept is as critical in achieving the goals inherent in the *National Environmental Policy Act (NEPA)* as is that of scoping. This paper describes how Value Engineering (VE) principles and modern management tools can be applied to improve the effectiveness of the NEPA planning process.<sup>1</sup>

### **A PROBLEM IN SEARCH OF A SOLUTION**

While the Council on Environmental Quality's (CEQ) NEPA regulations<sup>2</sup> (Regulations) are quite explicit in specifying *what* procedural requirements must be met in preparing an Environmental Impact Statement (EIS), the Regulations provide little direction on *how* such requirements are to be implemented. Federal agencies have been granted unusual latitude in determining *how* best to implement these requirements. Although NEPA has been in existence for more than a quarter of a century, only limited progress has been witnessed in developing and applying modern tools, techniques, and methodologies for managing the EIS process in a more efficient and effective manner.

An element essential to the success of an EIS involves the requirement to conduct a public scoping process to identify the range of actions, alternatives, and impacts for later analysis.<sup>3</sup> While scoping is a basic element, it is not uncommon to find that when an EIS has been completed, one discovers that the EIS does not adequately address decisions that eventually need to be made. Such discrepancies are often the result of disconnects between scoping and the actual decisionmaking that follows. Much of this problem is traceable to the fact that few rigorous tools or methods have been developed or accepted for effectively managing the EIS scoping process.

### **THE NEED FOR NEW TOOLS**

A need clearly exists for developing more effective tools, techniques, and methodologies to assist practitioners in accurately assessing the proper scope of the analysis. One such approach, pioneered at the U.S. Department of Energy's Hanford Site, Richland Washington, incorporates use of VE principles as a rigorous tool for managing EIS scoping. Incorporation of modern management tools is a key ingredient, essential to increasing the effectiveness of EIS planning. Implemented properly, VE principles and techniques offer a rigorous and disciplined methodology for managing many aspects of the NEPA process. This approach also has applicability to a wide array of other environmental planning and impact assessment processes. This paper briefly outlines this process as applied at the Hanford Site. However, the focus of this paper is on

presenting the reader with a generalized methodology that can be applied to any prescoping or scoping process.

### WHY VE PROVIDES AN EFFECTIVE TOOL FOR MANAGING NEPA

VE was pioneered as a structured approach for identifying substitutes to scarce materials at the close of the Second World War. Today, VE is used widely throughout industry to investigate root problems, formulate alternatives, and identify optimum solutions. Typically, a VE facilitator leads an interdisciplinary team of specialists through a number of rigorous procedures designed to break down preconceived and prejudicial notions, in an effort to provide a full and fair consideration of alternative methods and approaches that might lead to better solutions.<sup>4</sup> Properly assimilated, VE techniques and principles provide a structured foundation for instilling a disciplined approach to the scoping problem.

### CONNECTION BETWEEN NEPA AND VE

An integrated approach is also advantageous because it offers an efficient means for complying with a recently amended requirement to incorporate VE into government operations. Specifically, the *Office of Management and Budget* (OMB) has issued a directive mandating that VE be incorporated into federal operations, including project planning, in an effort to increase efficiency and reduce cost.<sup>5</sup> Under this directive, federal agencies are directed to apply VE in the planning of all major projects exceeding 1 million dollars. More recently, the *U.S. Congress* reinforced the application of VE when it enacted a statute mandating that federal agencies institute a cost effective VE program for improving performance.<sup>6</sup>

Federal agencies are now faced with a dual situation where NEPA and VE are both required to be performed on *major* federal projects. Is the OMB directive and congressional statute, and NEPA simply another case of redundancy where the federal government has mandated overlapping and perhaps repetitious requirements? Under closer examination, it is evident that NEPA and VE are neither redundant nor overlapping. Table 1 compares the principal characteristics and goals of VE with those of NEPA. As indicated, NEPA and VE share strikingly similar goals and requirements, which are not only compatible, but in fact complement one another. The commonality in these goals provides a foundation by which VE can be used as a tool for increasing effectiveness of the NEPA planning process. To date, this connection appears to have gone virtually unrecognized.

While NEPA provides an excellent framework for assessing and planning actions, the framework generally lacks a discrete and rigorous set of tools for addressing problems and issues. Unlike NEPA, VE is not a *planning process*. Instead, VE provides a 'tool box' of techniques and procedures that can be applied in effectively managing various aspects of the NEPA planning process. VE is particularly useful in identifying, assessing, and resolving root problems or issues. Thus, NEPA provides a comprehensive planning process, while VE provides intrinsic tools necessary for implementing NEPA's procedural requirements in an efficient and effective manner.

Correctly integrated, NEPA and VE can be synergistic.

| <b>Table 1. Comparison of the Requirements and Objectives of NEPA with those of VE.</b>  |  |
|--|--|
| <b>NEPA</b>  | <b>Value Engineering</b>   |
| NEPA is a planning and decisionmaking process.   | VE provides tools useful in managing a planning process.   |
| Requires use of a "Public" <sup>7</sup> , unbiased <sup>8</sup> , and "rigorous" process. <sup>9</sup>   | Premised on the use of an unbiased and rigorous process.   |
| Is predicated on use of a "systematic interdisciplinary" approach. <sup>10</sup>   | Uses a systematic and interdisciplinary process.   |
| "Combines" <sup>11</sup> other federal planning processes during the "early" <sup>12</sup> planning phase.   | Can be used to address pertinent planning problems.  |
| EISs must be prepared early enough, so to serve as an important contribution to decisionmaking. An EIS is not to be used to rationalize or justify decisions already made. <sup>13</sup> | VE should be applied early enough to assist in decisionmaking. It is not intended to justify decisions already made.   |
| An EIS analysis must provide a "full and fair discussion" of impacts and reasonable alternatives. <sup>14</sup>  | Premised on a full and fair analysis of alternatives.  |
| An EIS must explore and objectively evaluate all reasonable alternatives. <sup>15</sup> Alternatives form the "heart" of an EIS. <sup>16</sup>   | Promotes consideration of all possible alternatives.   |
| NEPA is the only federally mandated planning process that is applicable to all major federal actions.  | The OMB has directed that VE be applied to the planning of all major projects. A federal statute also mandates that federal agencies institute a cost-effective VE program that demonstrates tangible savings. |
| NEPA allows consideration of cost and other factors in the analysis and decisionmaking process.  | VE allows consideration of all pertinent planning requirements (e.g., cost, schedule, environmental).  |

### TOWARDS AN INTEGRATED APPROACH

Guided by an experienced facilitator, VE efforts can be intensely focused, such that a large amount of work can be accomplished in a very short period. In determining the preliminary scope, the goal is to leave no stone unturned. The facilitator is responsible for keeping the session focused and for promoting an open and nonhostile atmosphere where prevailing assumptions, mindsets, and paradigms are challenged in an effort to identify optimal solutions. Prejudicial and preconceived notions are openly challenged as an Inter-Disciplinary Team (IDT) identifies factors and solutions that might otherwise be overlooked.

Care must be exercised in developing a successful approach for integrating VE with NEPA.

Simply conducting a NEPA scoping effort under the auspices of a standard VE study is a recipe for ineffectiveness, if not calamity. A successful strategy requires prudence in the selection of the appropriate VE format and techniques that will be useful in managing specific problem areas in NEPA planning. To underscore this point, this paper refers to the integration of NEPA with *VE principles* rather than to the incorporation of a standard *VE study or process*. Determining an effective approach requires the experience and expertise of both disciplines.

### AN INTEGRATED NEPA/VE PRESCOPING WORKSHOP

Consistent with its commitment to environmental excellence, a prescoping effort was conducted by the U.S. Department of Energy to identify preliminary issues that would need to be considered in a subsequent EIS prepared on the Hanford Site. Information generated from this prescoping workshop would supplement and facilitate the formal public scoping process to follow.

To increase effectiveness of the environmental planning process, a new approach was attempted in which VE principles were used to focus and manage various aspects of the prescoping effort. A considerable amount of forethought and professional expertise was called upon in devising a cost-effective approach. Once a strategy was developed, an agenda and workshop mission statement were prepared to provide a tangible map for implementing the strategy. Table 2 provides a simplified agenda, while Table 3 describes the scoping goals and objectives for this workshop.

Based on experience gained from this facilitated workshop, a sequence of five discrete phases to be followed in a combined VE/NEPA prescoping effort is proposed in this paper (Table 4). This outline should be revised, as necessary, for conducting the agency's formal public scoping process.

**Table 2. Integrated NEPA/VE Prescoping Agenda.**



**DAY 1:**

1. Welcome and introductions (session guidelines and expectations)
2. Overview of the scoping statement, agenda, VE, and NEPA process
3. Informational sharing session
4. Functional Analysis Systems Technique (FAST) diagram of no-action alternative
5. Document potential decisionmaking assumptions

**DAY 2:**

1. Brainstorm session:
  - Identify criteria that might affect future decisions
  - Identify high-level decisions that might need to be considered. Rank decisions in importance.
2. Build Decision Identification Tree (DIT).

**DAY 3:**

1. List, consolidate, and prioritize preliminary scope of facilities, functions, and waste types to be considered in the potential EIS:
  - Based on waste categories, develop a list of facilities and functions that would need to be analyzed in the potential EIS.
2. Determine what will not be included in the preliminary scope of the potential EIS:
  - Issues that are important but not included in the preliminary scope are documented so they can be revisited at a later date. Some issues might be flagged as candidates for later tiering.
3. Identify any outstanding issues or concerns;
4. Brainstorm ideas for reducing EIS cost and schedule:
  - Identify additional actions that can be used to streamline scope and EIS process.

**DAY 4 (Half day):**

1. Wrap-up: Assign actions and prepare for managerial presentation.

Table 3. Goals and Objectives of the Workshop.

### Goals

- Determine preliminary scope of the actions, facilities, and operations that could be evaluated in a future EIS;
- Streamline the EIS process to obtain consensus on the scope during the early planning stages;
- Ensure that the scope addresses decisions that might need to be considered in the future;
- Reduce risk of later surprises (i.e., changes in scope because of inadequate communications or planning);
- Provide a basis for determining the cost and schedule of the EIS.

### Objectives

- Develop FAST diagram of the no-action alternative
- Determine *underlying* need for future actions
- Construct a DIT to determine specific decisions that might need to be made
- Identify key issues and concerns
  - Identify factors that might influence the decisionmaking process
  - Determine issues that will not be included in the scope. Document issues that are important but do not need to be considered at this time, so that these issues can be revisited at a later date (some issues could be flagged as candidates for later-tier NEPA analyses)
- Determine preliminary scope of the EIS:
  - Prioritized range of actions/operations (functions) where important decisions might need to be made
  - Range of facilities where important decisions might need to be made (prioritized)
  - Prioritized range of high-level alternatives (time permitting)

**Table 4. Generalized Process Used for Performing an Integrated NEPA/VE Prescoping Effort.**

- Identify the workshop objectives and assemble an interdisciplinary team
- Information phase:
  - Identifying underlying need
- Decision identification phase:
  - Identifying assumptions and planning documents;
  - Constructing a DIT
- Prescoping phase:
  - Identifying potential actions for analysis
  - Identifying potential alternatives
  - Identifying potentially significant impacts
- Improvement phase
- Presentation phase

#### **ASSEMBLING AN INTERDISCIPLINARY TEAM**

Care must be exercised to ensure that the scoping objectives are correctly identified before the prescoping effort is launched. By its very nature, scoping is an interdisciplinary process. To ensure that all relevant planning factors are captured, emphasis was placed on assembling an IDT of subject matter experts. The prescoping workshop described in this paper ran 3½ consecutive days and involved approximately 12 full-time and 10 part-time members.

#### **Kick-Off Meeting**

Approximately 1 week before the scheduled workshop, a kick-off meeting was held to discuss the purpose, objectives, and to assign actions items. A workshop mission statement and agenda were prepared to specifically address the scoping objectives. The prescoping workshop mission

statement and agenda were distributed at the kick-off meeting. Certain members were requested to prepare presentations for the informational sharing phase conducted the first day of the prescoping workshop.

The individual steps or phases for implementing an integrated VE/NEPA prescoping workshop are described in the following sections.

### **INITIATING AN INTERNAL PRESCOPING WORKSHOP**

The VE facilitator initiated the prescoping workshop by reviewing the workshop mission statement and explaining the process and techniques to be used. The workshop proceeded into an Information Phase where pertinent background information that might have a bearing on determining the scope was presented.

Promoting an atmosphere that encourages innovative thinking is an element essential to this strategy. Value engineering principles provide a framework for breaking down pre-conceived barriers in an attempt to identify alternatives and issues that might otherwise go unnoticed. Emphasis is placed on 'thinking outside the box.' The facilitator is responsible for creating an atmosphere that is conducive to a free and uninhibited exchange of ideas. Accordingly, participants are prohibited from criticizing suggestions offered during the brainstorming sessions of the workshop

### **INFORMATION PHASE**

Information pertinent to scoping, such as inconsistencies in other planning schedules or proposals, pertinent data or planning studies, and other related project or planning information, were identified during the information phase. Full-time and part-time members presented information that might have a bearing on the scope. This information (e.g., keywords, ideas, issues and concerns, and assumptions) is captured by the facilitator on flip charts. The facilitator was responsible for keeping the session focused and on schedule. Except in unusual circumstances, this phase should be limited to no more than a few hours.

### **IDENTIFYING THE UNDERLYING NEED**

To support the scoping process, an effort is mounted to succinctly define the *underlying* need for future action. Webster's dictionary defines the term "need" as "a want of something requisite, desirable, or useful". Identifying and accurately defining the underlying need can be deceptively complicated. While the need might at first appear intuitively obvious on closer inspection, there is -- often confusion or differing views regarding the *underlying* need.

The group was first challenged to identify underlying need(s). Responses were recorded on a flip chart by the facilitator. Next, the group reviewed, sorted, and consolidated these responses to

develop a succinct definition of the primary or underlying need.

Once consensus is reached regarding the need, the IDT is tasked with a similar exercise for defining the purpose for taking action. The term "purpose" should not be confused with the "need". Purpose is defined as a goal or object to be obtained. A similar exercise was conducted to determine potential goals to aid in identify underlying purposes.

Defining the underlying need was an important step, because this could drive the range of alternatives investigated later.<sup>17</sup> Not surprisingly, a small change in the definition of need could have profound implications on the range of alternatives that might need to be evaluated. Correctly defining the underlying need at this early stage could substantially improve the effectiveness of the planning process that follows.

## **IDENTIFYING ASSUMPTIONS AND PLANNING DOCUMENTS**

An exercise is conducted to identify principal assumptions that could affect the planning and decisionmaking process. A brainstorming exercise is conducted in which the IDT is challenged to identify pertinent planning assumptions, which were recorded by the facilitator on a flip chart. Assumptions identified during the remaining portion of the workshop were added to this list.

Similarly, an exercise was conducted to identify all planning documents and studies that might have a bearing on preparation of the EIS. Capturing such information at this early planning phase is important, not only because this information could shape the ultimate scope, but also because it could may avert duplication and wasted efforts. A flip chart was also maintained for capturing issues and concerns identified throughout the workshop.

## **DECISION IDENTIFICATION PHASE**

First and foremost, an EIS is a planning tool for providing decisionmakers with pertinent information to support informed decisionmaking. No EIS can properly support subsequent decisionmaking if it does not correctly anticipate and supply pertinent information on decisions that might need to be considered. Consequently, analysts must correctly anticipate the scope of decisions that need to be considered. While such an observation appears obvious, it is not uncommon to find which an EIS has been completed, only to discover that the EIS does not adequately anticipate the types of decisions that need to be considered. Such discrepancies result from disconnects between the scope of the analysis and actual decisionmaking that follows. This observation is particularly true when dealing with complex projects or dynamic circumstances. In this phase, an exercise was undertaken to identify potential decisions that might eventually need to be considered. A new approach was developed, referred to as *Decision-Based Scoping (DBS)*, which is in marked contrast to the way most scoping efforts are typically conducted. Under the DBS approach, emphasis is placed on first identifying potential *decisions* that eventually *may need to be considered* by decisionmakers. Once potential decisions are identified, the scope of actions, impacts, and alternatives naturally follows. A DBS approach is especially well suited for large or

complex EISs, and in scoping programmatic EISs.

### **Constructing a Decision Identification Tree**

In support of this DBS approach, a new tool, referred to as a DIT, was developed for use in conjunction with the DBS approach to assist the IDT in identifying potential decisionpoints that the EIS might need to address to support decisionmaking. The DIT provides a systematic methodology for identifying and mapping potential decisions.

To support development of the DIT, a brainstorming exercise was initiated to identify factors that might affect future decisionmaking. The VE facilitator recorded each of these factors on a flip chart. Table 5 provides a partial list of such factors.

Table 5. Factors That Might Affect  
Future Decisionmaking.

Project schedule

Funding

Public input

Potential land use

Consistency with previous decisions

Available technology and constraints

State and federal regulations and regulatory decisions

Worker safety

Availability of support infrastructure

Infrastructure factors.

A brainstorming session is next conducted in which the facilitator challenges the IDT to identify principal decisions that *might* need to be considered by a decisionmaker in the future. The facilitator recorded suggestions offered by the participants onto Post-Its® which were affixed to a different flip chart. These decisionpoints formed the basis for constructing the DIT. The facilitator challenged the group to identify the most fundamental decision identified during this brainstorming session. The Post-It corresponding to this decisionpoint was assigned as the first

element on the decision tree. Once this decisionpoint was identified, the group identified successfully lower-level decisions, triggered by this fundamental decision. This was an iterative process that continued until the IDT was confident that all major decisionpoints were identified that the scope of a future EIS might need to support.

Identification of potential decisionpoints that the EIS must be prepared to support provides a basis for determining the range of actions that will need to be evaluated. These actions, combined with the underlying purpose and need identified previously, provide a basis for deriving a range of potential alternatives to be investigated. Once the actions and alternatives have been identified, the agency can begin identifying the scope of environmental impacts and issues to be investigated.

## **PRESCOPING PHASE**

Once the potential decisionpoints are identified, a brainstorming exercise can be initiated to identify actions, alternatives, and impacts that might comprise the proposed action. One of the principal objectives of the scoping process is to eliminate unnecessary issues from the potential scope - a powerful method for reducing the cost of an EIS and a requirement that is often underutilized.<sup>18</sup> Accordingly, emphasis focused on identifying unimportant issues for elimination during the formal scoping process.

### **Identifying Potential Actions for Analysis**

An effort could be conducted to identify potential actions that would be included in the proposal. A brainstorming exercise was initiated to identify these potential actions, which were recorded on a flip chart by the facilitator. Emphasis was placed on identifying connected actions that might otherwise go unnoticed. The actions identified during this effort are reviewed in more detail by specialists during the formal scoping process.

### **Identifying Potential Alternatives**

An exercise could be conducted to identify potential alternatives to the proposed action. Emphasis is placed on breaking down pre-conceived barriers in an attempt to identify alternatives and issues that might otherwise go unnoticed. Care must be taken to ensure that the IDT does not arbitrarily dismiss any reasonable alternatives.

The group reviews the suggestions in an attempt to *flag* any alternatives that appear to be *clearly* unreasonable or of little value. The rule used in flagging unreasonable alternatives is that unanimous consensus must be obtained to eliminate an item. To ensure that no reasonable alternatives are arbitrarily eliminated, it is recommended that the actual decision be made after the workshop is completed and that the decision be carefully documented. A second round could be conducted to consolidate and combine overlapping or redundant alternatives.

### **Identifying Potentially Significant Impacts**

If time permits the IDT also could be challenged to identify potentially significant environmental impacts and issues for later analysis. Emphasis is placed on identifying indirect and cumulative impacts that often go unrecognized

As described in the afformentioned section, an effort should also be made by the IDT to identify impact/issues that probably would not be significant. The actual determination should be reserved for later review.

### **IMPROVEMENT PHASE**

An effort was also mounted to identify methods and approaches for reducing cost and expediting preparation of an EIS. A brainstorming session was used to elicit ideas from participants in an attempt to investigate every conceivable method for improving efficiency and effectiveness. The facilitator records suggestions offered by the participants on flip charts. Special VE techniques can be employed to evaluate these suggestions. The evaluation consisted of three distinct stages or rounds.

In the first round, the group reviews suggestions in an attempt to eliminate ideas that are *clearly* unreasonable or of little consequences. The facilitator leads the IDT through each suggestion in an attempt to identify suggestions that can be eliminated. The second round consists of consolidating and combining suggestions into manageable categories. The third and final round involves use of matrix weighting methods, such as nominal group techniques, in an effort to generate a prioritized list of methods.

### **Using Functional Analysis to Investigate the No Action Alternative**

As part of this effort, the IDT might prepare a Functional Analysis System Technique (FAST) diagram to assess activities currently being conducted as part of the no-action alternative. The FAST diagram is founded on the observation that a rigorous evaluation of functions underlining a particular process provides the basis for evaluating problems and alternatives. The FAST diagram provides a systematic tool for identifying these functions.

Principal functions governing the no-action alternative (baseline condition) were first identified and described using an active verb and proper noun. Using these functions, a diagram is constructed illustrating "how" and "why" particular functions are conducted. Moving from right-to-left across the diagram indicates the logic of *why* particular functions are conducted. Conversely, moving in the opposite direction (left-to-right) across the diagram reveals the sequence of *how* functions are implemented. When completed, the logical sequence of *how* functions are conducted should be consistent with the reason for *why* each function is conducted.

Once basic functions have been identified, the IDT will identify methods for improving or



optimizing a process. A FAST diagram can provide a useful tool for understanding the current baseline, identifying functional requirements and relationships, and challenging preconceived assumptions and ideas. Where appropriate, other planning considerations such as resource and infrastructure requirements could also be analyzed.

Preparation of a FAST diagram can be resource intensive, consuming a substantial portion of a scoping workshop schedule. In some cases, a FAST diagram might contribute valuable information, while in other, little or no benefit is derived from its development. Practitioners should *carefully consider* the purpose and benefits that would be derived in constructing a FAST diagram. Prudence and professional judgment must be exercised in determining the appropriate use and application (if any) of a FAST diagram with respect to scoping. The stage is now set for presenting the results.

## **PRESENTATION PHASE**

The final phase involves presenting the results to decisionmakers. Focused towards peer review, this phase allows decisionmakers and planners to review the potential scope to determine if there are any issues that have not been addressed. Once this step has been completed, the stage is set for preparing and issuing a Notice of Intent (NOI), which completes the prescoping phase.

On completing the presentation phase, a *pre-scoping meeting* was held to review the results of the pre-scoping workshop in more detail. The focus of the pre-scoping meeting was to obtain a final consensus on the preliminary scope. With only one exception, the pre-scoping workshop had successfully identified the principal issues and actions that at that time were considered essential for analysis. Consequently, the pre-scoping meeting was able to quickly obtain consensus on the preliminary scope.

On completing the pre-scoping meeting, the general consensus was that construction of the DIT, in conjunction with the VE workshop, had been very effective in identifying what was otherwise a rather enigmatic set of potential issues and actions. Probably this approach would translate into long-term cost savings. Because systematic tools and methodologies were employed to rigorously identify the scope, the risk that unforeseen issues or actions will later arise can be greatly reduced. By accurately identifying the range of actions "ripe for decision," a more thorough analysis and planning effort would also be conducted.

## **CONCLUSIONS**

An efficient NEPA/VE approach requires considerable preparation including the expertise of specialists representing both disciplines. Simply conducting a NEPA scoping effort under the guise of a standard VE study is unlikely to provide effective results. Both facilitator and participants must appreciate the difference between a NEPA scoping workshop and merely conducting a standard VE problem solving study. The successful strategy must be tailored to the circumstances, objectives, and deliverables desired. Success requires prudence in the way VE

techniques are selected and integrated as tools for managing specific aspects of the NEPA process. The agenda should be prepared with clear objectives and team members should concur on these at the beginning.

Integration of NEPA, VE, and modern management tools is a concept which is virtually unrecognized and untapped. VE techniques and principles offer a rigorous and disciplined methodology for managing many aspects of NEPA. The prescoping effort provides an excellent method for identifying potential actions, alternatives and impacts, resource and infrastructure requirements, related regulatory requirements, and potential controversy which might be encountered during the formal scoping process. This information is useful for assessing resource requirements and for developing a coherent basis for the need to take action, and enhance agency credibility.

An integrated approach provides a key element necessary for enhancing efficiency and effectiveness of various aspects of the NEPA process. While this approach holds great promise, effort must be directed at determining how VE and modern project management tools are best integrated with the NEPA process. As experience is gained, the techniques and strategies will increase the effectiveness of this approach.

Facilitated workshops offer a useful tool for effectively managing and conducting internal and public NEPA scoping sessions. A facilitated workshop can promote an open atmosphere where prevailing assumptions and mindsets are challenged to identify innovative and imaginative alternatives which might otherwise go unnoticed. VE techniques, such as preparing problem/issue statements and group brainstorming methods, provide useful tools for identifying and evaluating alternatives and issues. This approach ensures that each participant has a full and fair opportunity to provide feedback and voice opinions.

The VE techniques described in this paper were successfully used to quickly focus what might otherwise have been a complex and meandering effort. In this example, the IDT obtained consensus on the preliminary scope, and a large degree of work was accomplished in a short period. The potential savings, avoiding future mistakes and discovering factors which might be overlooked can easily exceed the cost of the VE study, many times over.

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14. 40 CFR 1502.1.

15. 40 CFR 1502.14(a).

16. 40 CFR 1500.2(e), 1502.1, 1502.14(a) and (c).

17. Schmidt, Owen L., "The Statement of Purpose and Need Defines the Range of Alternatives in Environmental Documents," *18 Environmental Law* 371-81, 1988.

18. 40 CFR 1500.4 (g) and 1501.7 (a)(3).