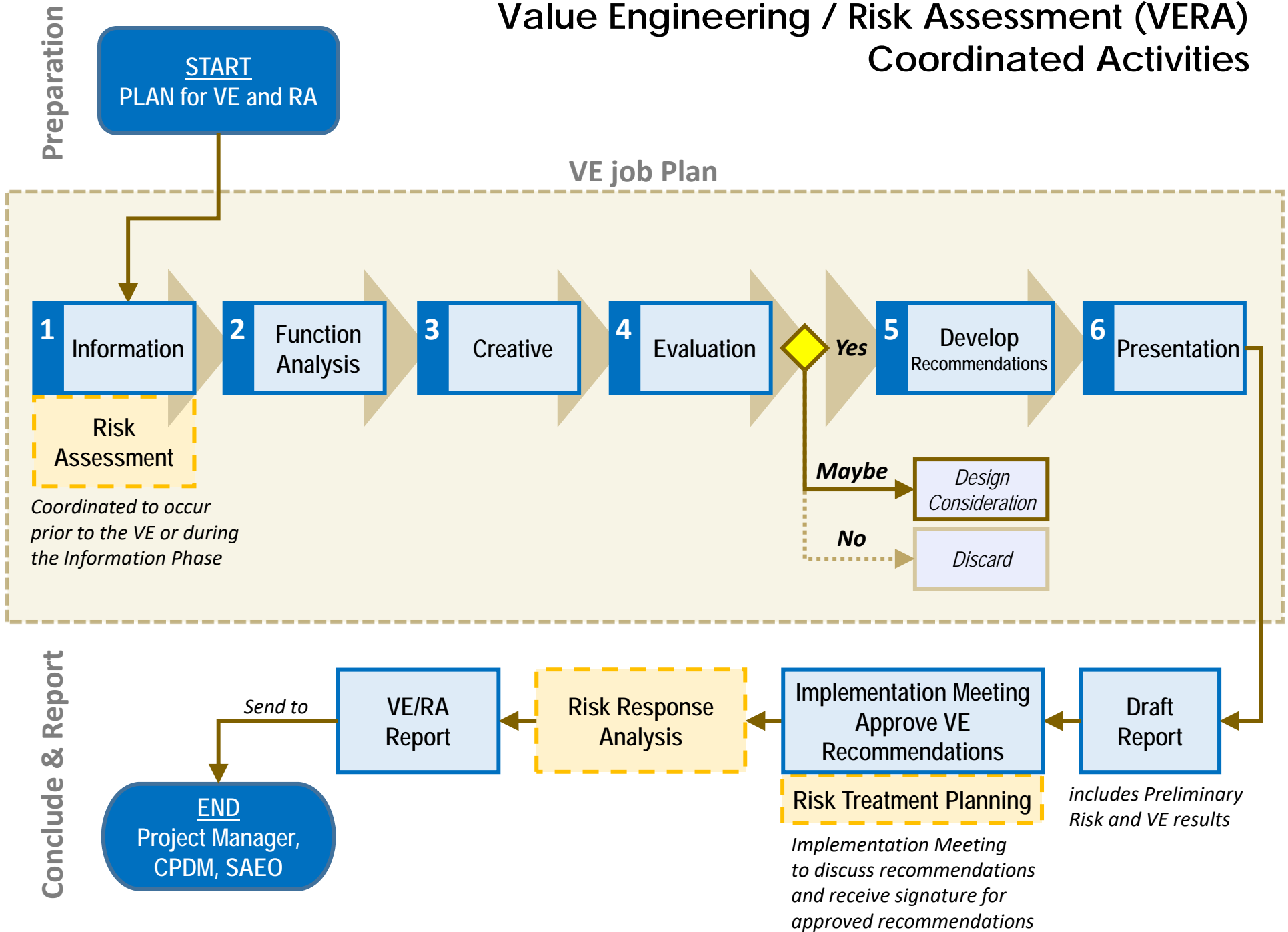


# Value Engineering / Risk Assessment (VERA) Coordinated Activities



# 1

# Information Phase

- **The Kick – off meeting**
- **Agenda Review**
- **Project Overview**
- **Stakeholders Input**
- **Requirements and performance attributes for the project**
- **Site Visit**

## **The Objective of the information Phase of the Value Engineering (VE) Job Plan is to gather and assess information regarding the project of study to gain a thorough understanding of the need that must be met to achieve the purpose of the project**

Detailed information and data for all aspects relating to the project include the current conditions, needs that engendered the project and those challenges that face fruition of the project.

The Information phase provides a thorough understanding of the situation that initiated study. Accurate and comprehensive information is essential to providing a good foundation for a successful VE study. The complexity of the project, the amount of information available, and the study schedule will impact the level of effort devoted to the Investigation phase.

Some Information to be gathered would be:

- Project Scope, Schedule and Cost information. This includes initial cost and life cycle cost elements.
- Value Metrics - Value measurement of the project performance
- Site Visit

A week or more prior to the VE study the VE team should be provided with a packet containing all the current and accurate project information for them to study in preparation for the meeting.

### **The Information Phase of a VE workshop generally consists of:**

**The Kick – off meeting** – Team Member introductions, Workshop ground rules etc.

**Agenda Review** – Process, responsibilities, schedule and activities are discussed.

**Project Overview** – The Project Manager and Team will present an overview of the project, and discuss the purpose and need that initiated the project. The project as described in the overview then becomes the Baseline for the VE team to work from.

**Stakeholders** – Project Stakeholders will discuss concerns, issues and goals concerning the project. Special operational needs and/or accommodations and considerations will be brought forth at this time.

**Requirements and performance attributes for the project** – The VE team Leader will lead a discussion soliciting the VE Team members to determine and establish the requirements and performance attributes that are essential that the project achieve. These will then be evaluated against the Baseline concept.

**Site Visit** – The Project Manager and VE Team may visit the project site. This will provide a visual understanding of the facilities current operations and site conditions.

After the Site Visit the VE team should discuss and document their observations from the site.

# 2

# Function Analysis Phase

- **Defining Functions**
- **Classifying the Functions**
- **Estimate Cost to perform Function**
- **Evaluating the Functions for worth**
- **Refine the Scope to show changes.**

## The Objective of the Function Analysis Phase of the Value Engineering (VE) Job Plan is to gain a clear, unbiased understanding of the Needs of the project.

Function analysis allows team members to communicate about project functions that require multi-disciplinary consideration. These functions are expressed in two-word descriptions comprised of an “active” verb and “measurable” noun. This concise description directs attention to the function of something, rather than focusing on the ‘thing’ itself. Thus allowing problems to be addressed objectively without the bias of a pre-determined solution.

### Why should Function Analysis be performed?

Function Analysis supports creative problem solving by moving the focus away from the expected solution and placing the focus on the required performance or need.

### The Function Analysis Phase of the workshop generally consists of:

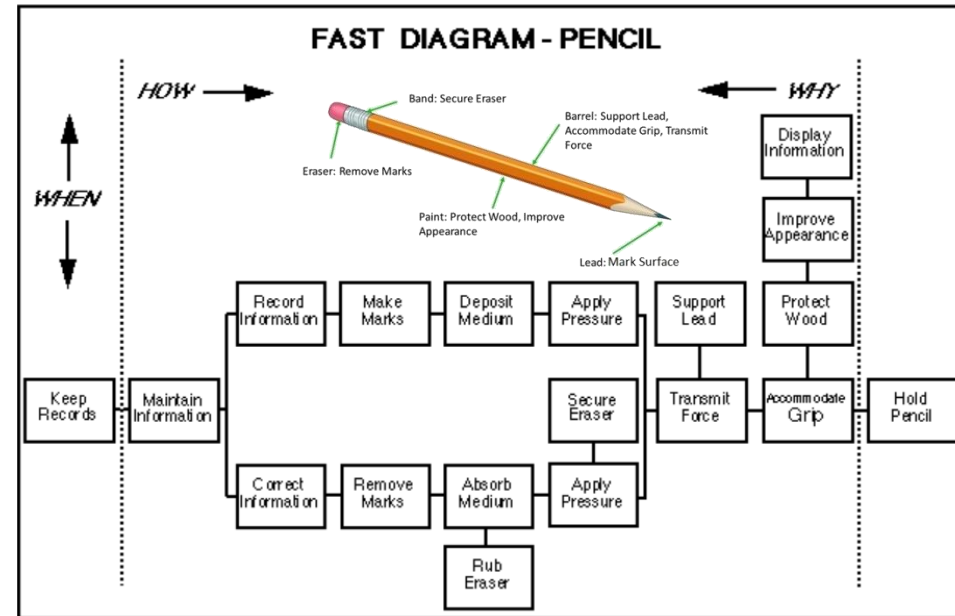
**Defining Functions** – Active verb, measurable noun. Creating concise two-word descriptions describing “what does this function do “ and “what does it do it to”

**Classifying the function** – is it a **Basic Function** ( Purpose for which the project exists ), **Secondary function** ( supporting the basic function) or a **Higher order** (The specific Need of the project and reason for the Basic Function /Purpose) or **Lower order** function (input that initiated the need for the project)

**Estimate Cost to perform Function** – Current cost

**Evaluating the Functions for worth** – Evaluate for the significant function areas that represent the greatest return for Brainstorming during the Creative Phase.

**Refine the Scope** – Adjust the scope as necessary for revisions made while determining the actual agreed on Purpose and Need of the project.



EXAMPLE: Functional Analysis of a pencil

# 3

## Creative Phase

- **Generate ideas for alternative ways to perform the functions identified for the project under study.**

**The Objective of the Creative Phase is the application of creative methods and techniques to address any given problem. These serve to generate many diverse and innovative Ideas that provide potential for improved processes, methods or services.**

Once the Functional Analysis phase is complete and the given problem has been thoroughly defined, the Creative Phase provides an opportunity to conceive alternate solutions that will accomplish the necessary basic functions.

This phase allows the team to use their creativity and produce alternate methods of performing the project functions.

This Phase involves all the team members in the free flow brainstorming of innovative and creative idea generation for alternative solutions. The team members work together create new and build on each others ideas, generating as many opportunities as they can for increasing the value of the project.

**The Creative Phase of the workshop generally consists of:**

**Creative Thinking Exercises** – There are many techniques to facilitate creative thinking, a few are:



- Brain Storming
- Checklists
- Attribute Listing
- Brain Sketching

# 4

## Evaluation Phase

- **Eliminate Ideas with low potential to add value**
- **Group Ideas that are Similar**
- **Determine Advocates for each Idea**
- **List Idea Advantages & Disadvantages**
- **Rank the Ideas**
- **Select Ideas for further Development**



## **The Objective of the Evaluation Phase is to bring the best ideas from the Creative phase forward, then evaluate and refine them into potential solutions.**

During the evaluation phase it important to take the ideas from the creative phase and critically evaluate each idea to see if it provides a right decision or solution for the project under study

### **The Evaluation Phase of a VE workshop generally consists of:**

- Eliminate impractical or unrealistic ideas
- Combine “Like Ideas”
- Use tools to form team consensus in determining value of remaining ideas:
  - Advantage / Dis-advantage List
  - Paired Comparison
  - Life cycle cost analysis
- Select Highest Scoring ideas for Development.

# 5

# Development

- **Demonstrate how the new idea will work**
- **Demonstrate that the new idea meets the basic function and adds value.**
- **Develop the new idea so that it may be presented as a value-added feasible alternative to the base design**

## **The Objective of the Development Phase is to further analyze and Develop the “short list” of ideas with merit or potential into Recommendations**

During the Development phase all team members participate in the Idea write ups. It is important that the selected ideas are written so that the project Owners and stakeholders may easily understand how the value alternative benefits the project over the Base design.

Idea write-ups typically include:

- ◆ Clear textual description of the concept, if applicable this text should also include other alternates that this alternate complements.
- ◆ Sketches, schedules and diagrams.
- ◆ Assumptions
- ◆ Cost comparison worksheets, supporting calculations, vendor information.

### **The Development Phase of a VE workshop generally consists of:**

- Compare conclusions to the project requirements identified during the Functional analysis Phase.
- Document the teams decision making process so that it is clear how their conclusions were reached in evaluating the information they had at the time of the workshop.
- Prove feasibility of the ideas and verify assumptions and engineering judgment.
- Prepare idea write-ups.
- Perform life cycle cost analysis.
- Develop implementation plan

# 6

# Present

- **Consider the audience for the presentation.**
- **Determine how the ideas should be presented**
- **Present to decision makers the VE teams ideas.**
- **Be prepared with answers for questions from decision makers.**
- **Create Implementation plan**

## **The Objective of the Presentation Phase is to present the value alternatives to the project stakeholders and decision makers**

During the Presentation Phase the team will present the proposals generated that they believe represent better value than the originally proposed solution. The Presentation Phase is also an opportunity for decision makers assess the analysis and ask questions of the team.

### **The Development Phase of a VE workshop generally consists of:**

- Prepare the presentation
- Presentation to Decision Makers
  - Project History
  - Functions analyzed
  - Base design and offered alternatives
  - How the study conclusions meet the success requirements established for the project
  - Project cost analysis and summary of benefits.
- Outline implementation plan

# Approved VE Recommendations

- **Discuss and agree on Alternatives**
- **Items for discussion that impact Risk Treatment**
- **Review Value Added**
- **Plan for Implementation meeting for approval of recommendation.**

# Final Report

- **One Pager**
- **Executive Summary**
- **Project Overview and VE Analysis**
- **Risk Assessment**
- **Estimate Review**
- **Schedule and Flowchart**

# Plan for VE and RA

## **VE coordinator, Risk lead, SMEs and Project team members**

- Determine the team members for the Risk Assessment and the Value Study
- Determine timing, structure and coordination of the workshops
- Advance Review of the Project Schedule and Estimate
- Advanced Risk elicitation interview
- Organize Project Materials for VE / RA teams to review



# Risk Assessment

VERA  
workshop  
participants

VERA  
risk modeler

## Review :

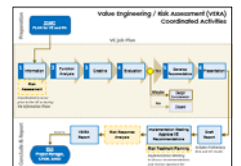
- **Scope**
- **Schedule**
- **Estimate**

**Establish Base**  
Variability,  
Market Conditions,  
Inflation Points,  
Risk Markups

**Risk  
Identification**

**Risk Analysis**  
quantify  
probabilities and  
impacts of all risks

**Model Project  
Risks**  
share output with  
workshop  
participants



# Risk Treatment Planning

VERA  
workshop  
participants

## Review Post-VE:

- Recommendations
- Scope
- Schedule
- Estimate
- Pre-VE Risk Register
- Risk Model Output

## Identify Obsolete Risks

omit from  
Post-VE  
Risk Register

## Identify New Risks

add to  
Post-VE  
Risk Register

## Select Risk Response Strategies

for all risks on  
Post-VE  
Risk Register

## Threats

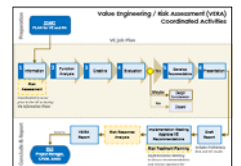
- Avoid
- Transfer
- Mitigate
- Accept

## Opportunities

- Exploit
- Share
- Enhance
- Accept

## Develop Response Plans

for risks that are  
not Accepted



# Risk Response Analysis

VERA  
workshop  
participants

## Review Post-VE:

- Risk Register
- Response Strategies
- Response Plans

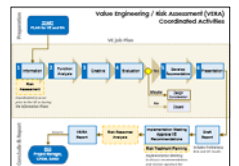
## Response Analysis

quantify remaining probabilities and impacts assuming perfect Response Plan execution

VERA  
risk modeler

## Model Risk Response

compare output with Pre-Response Risk Model output



# VE / RA Report

## Risk Lead

- Run simulations for pre and post- mitigated

Provide Risk data with graphs and tables for the report that include:

- ✓ Cost distributions
- ✓ Schedule distributions
- ✓ Candidates for mitigation
- ✓ Tornado diagram
- ✓ Risks Map