Value Solutions – A Path to Sustain Infrastructure

Incorporating Risk into Value Engineering in the Construction Industry

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The TEAM FOCUS Group
Preface

• Where are we now with Value Management and Risk Management?
• Where have we come from?
• How do we consider Risk at the various stages of a Project?
• How is Risk being incorporated into the Value Methodology?
• Where do we go into the future?
The History - VM

• Since its inception in the late 1940s, the Value Methodology has not included Risk Management in a structured manner.

  – However, value practitioners will have taken risk into account implicitly in their proposals where they considered it appropriate to do so.
The History - RM

- Equally the Construction industry has not practised Risk Management in a structured manner until recent times.
  - Even when Risk Registers have been created, how often have we seen them put in the “bottom drawer” and not used?
The Consequences

• We can probably all name projects that have gone wrong

• Some have been linked to the Millennium
  – Where the Millennium itself has been the main driver, without consideration for what would happen after the celebrations were over
  – What if the finished project has no function after the Millennium?

• If Value and Risk methodologies had been in place, would this have happened?
Some History – VRM

• SAVE International (1995)
  – “The Value Management approach encourages earlier than usual participation of all interested parties and agreement of values to be assigned to a range of project parameters. This ensures a higher degree of confidence that risk management goals are defined and achieved.” Martyn Phillips

• VEAMAC debated it in 1998
  – In respect of the Briefing Stage of a Project, the overwhelming consensus was that the line between two different disciplines, Value and Risk Management, is moveable and determined by the emphasis on risk that clients want and expect.
Some History – VRM

• SAVE International debated it in Montreal this year, and although not recorded, the conclusions were not dissimilar to those drawn by VEAMAC. But there were strong voices, as at VEAMAC, for and against:
  – FOR: “VRM is being used successfully on some projects because RM and VM have many similar activities which can be undertaken concurrently”
  – AGAINST: “Risk Management should be a separate workshop from Value Management - different focuses”

• There seemed to be more in favour than against.
• But are they not both right, depending on the circumstances?
Conclusions to be drawn from these debates:

- The industry as a whole has not yet established how to deal with risk in Value Management in a structured or consistent manner.
- Many individuals and businesses do practise VRM and have been doing so for quite a long time.
- We need to look at that moving line between Value Management and Risk Management.
To achieve the right focus between Value, Cost Reductions and Risk, we need to find the right balance.

Where is the optimum point?

Certainly not where risk is hardly considered.

Certainly not where achieving value is hardly considered.
VRM Focus

• That optimum point really does depend on the stage at which you are with the project.
  – Inception (Strategic and Conceptual)
  – Feasibility and Preliminary Design
  – Detailed Design
  – Construction
  – Operation and Maintenance

• Look at the categories of risk likely to be considered at each stage……..
Risk Considerations at Various Stages of VM

<table>
<thead>
<tr>
<th>Project Stage</th>
<th>Inception (Strategic and Conceptual)</th>
<th>Feasibility and Preliminary Design</th>
<th>Detailed Design</th>
<th>Construction</th>
<th>Operation and Maintenance</th>
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</thead>
<tbody>
<tr>
<td>Risk Assessment</td>
<td>Qualitative Analysis Risk Categories Considered:</td>
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<tr>
<td></td>
<td>• Management</td>
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<td>• Environment</td>
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<tr>
<td></td>
<td>• Third Party</td>
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<tr>
<td></td>
<td>• Design</td>
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<td>• Construction</td>
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<td>• Operation &amp; Maintenance</td>
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<tr>
<td></td>
<td>• Safety</td>
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<td></td>
<td>Potential reasons for the Project</td>
<td>Balance between Best Value and Least Risk</td>
<td>Constructability Failure Mode Analysis?</td>
<td>Constructability Failure Mode Analysis?</td>
<td>Reliability Failure Mode Analysis?</td>
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</tbody>
</table>

Quantitative Analysis

- Probabilities & Consequences. Estimate: ± 50% (if relevant)
- Probabilities & Consequences. Estimate: ± 25% Risk allowance prediction by Root Mean Squared?
- Probabilities & Consequences. Estimate: ± 10 - 15% Risk allowance prediction by Monte Carlo?
- Probabilities & Consequences. Estimate: ± 5% Risk allowance prediction by Monte Carlo?
Example: Red River Floodway Expansion Project

- Risks identified at Concept Stage:
  - Management – 45%
  - Operation – 29%
  - Construction – 19%
  - Design – 5%
  - Third party – 2%
  - Environment and Safety Risks – considered negligible at this stage
## Linking Risk to VE

<table>
<thead>
<tr>
<th>JOB PLAN PHASE</th>
<th>RISK CONSIDERATIONS</th>
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</thead>
<tbody>
<tr>
<td><strong>Information Phase</strong></td>
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<tr>
<td>• Listing of known risks, issues, problems associated with the project</td>
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<td>• The Project may have been initiated as a result of a problem or risk</td>
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<td><strong>Function Analysis Phase</strong></td>
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<tr>
<td>• Some functions may be to avoid known risks</td>
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<td>• The risk that there could be changes in function not considered</td>
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<td><strong>Creative Phase</strong></td>
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<td>• Ideas may address how to get round known or possible risks</td>
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<tr>
<td>• Some ideas may in fact be risk related rather than value related</td>
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<td><strong>Evaluation Phase</strong></td>
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<tr>
<td>Evaluation criteria should include risk items to eliminate ideas which have a very high risk associated with them</td>
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<td><strong>Development Phase</strong></td>
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<td>• Risk allowances associated with each proposal at all stages of a project, especially during the construction and operation and maintenance will give a better comparison of proposals during any cost / benefit analysis using whole life costing</td>
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<tr>
<td>• Time implications</td>
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<td><strong>Presentation Phase</strong></td>
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<td>The risk that not everyone will sign up to the preferred proposal and how to deal with it</td>
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### Value Enhancement / Saving Management Report

**Project:**

**Section of Works:**

**Category of Proposal:**

**Proposal for Better Project Value:** (Full description)

**Priority:**

**Possible Measures to be carried out:** (Itemise options)
1. 
2. 
3. 

**Possible Value Enhancement resulting:** (For each item, what value enhancement?)
1. 
2. 
3. 

**Possible Secondary Risks as a result of saving measures:** (New risks that could arise)
1. 
2. 
3. 

**Residual risks that may still exist after measures implemented:**
1. 
2. 
3. 

**Who owns the original value / saving:**

**Who owns the residual risks:**

**Action Plan:**

**By whom:**

**By when:**

**Estimated cost and time implications of actions and comments:**

### Risk Mitigation Report

**Project:**

**Section of Works:**

**Category of Risk:**

**Hazard / Risk Description:** (Full description)

**Impact:**

**Possible Risk Reduction Measures to be carried out:** (Itemise options)
1. 
2. 
3. 

**Possible Value Enhancement resulting:** (For each item, what value enhancement if any?)
1. 
2. 
3. 

**Possible Secondary Risks as a result of reduction measures:** (New risks that could arise)
1. 
2. 
3. 

**Residual risks that may still exist after measures implemented:**
1. 
2. 
3. 

**Who owns the original risk:**

**Who owns the residual risks:**

**Action Plan:**

**By whom:**

**By when:**

**Estimated cost and time implications of actions and comments:**

**Comments / Cost Estimates:**
Value Enhancement vs. Risk

- Judging from what we have just seen, there are strong similarities between the ways that Value Proposals and Risks need to be managed
- So why not capitalise on this.........
Conclusion

And draw on good practice to develop a structured and standard international procedure for VRM which can be used by all to achieve Best Value in our projects every time ............
Don’t forget the Risk Analysis Panel this afternoon at 2.45pm