

DAVIS LANGDON



A MEMBER OF DAVIS LANGDON & SEAH INTERNATIONAL

San Francisco
Los Angeles
Sacramento
Seattle
New York
Boston
Philadelphia

A presentation on
approaches to incorporating risk in value

Will Willson – Associate Principal

October 24th 2006

Canadian Institute of Value Management

Conference Toronto



DAVIS LANGDON

Introduction



Introduction

Firm profile

- 32 Years Experience in the United States
- 86 member staff
- Office locations in Boston, Los Angeles, New York, Philadelphia, Sacramento, San Francisco, Seattle, and Vermont
- Member of Davis Langdon Seah International, which has 3,200 staff in 80 offices worldwide



Services

- Project Management
- Sustainability Consulting
- Specification Consulting
- Cost Management
 - **Benchmarking / Target Costing**
 - **Cost Control / Cost Planning**
 - **Procurement**
 - **Life Cycle Cost Analysis**
 - **Project Controls**
- Value and Risk Management
- Research and Publications



Amalgamating risk with value

- **Background....Value 15% Risk 85%** as a UK Chartered Quantity Surveyor
- Merck Hoddiston 'Tichler Plant' UK
- GSK Environmental Mitigation, Lean construction, Modular Construction UK
- DERA military research facilities UK (Farn/b, Chertsey, Malvern)
- Schering MPP Ph 1 & 2, Tablet & Biotech Singapore
- J&J Biotech Leiden Holland
- OMB New York – Highways, Prisons, WWTW, Laboratories, Waste disposal
- WWTW Toronto – Ashbridges Bay WWTW
- MTO Ontario – Detroit / Windsor VACAS grade separation study
- Light Rail Seattle
- High Speed Rail UK
- OMB NY NY



Approaches to incorporating risk in value

1. Changing anything through a VE study alters the risk profile
2. Mitigation is a form of VE
3. Opportunity analysis is a form of VE
4. The greatest opportunities to reduce cost without detriment to scope or function is to reduce the greatest risks



Separate risk workshop before
of after VE workshop

or

Integrated risk and VE
workshop



Inception phase

Learning about the project

- Objectives
- Value drivers
- Scope lines
- Interfaces
- Constraints

Risk or value workshops start the same way





Resistance to incorporation of VE in traditional SAVE workshops

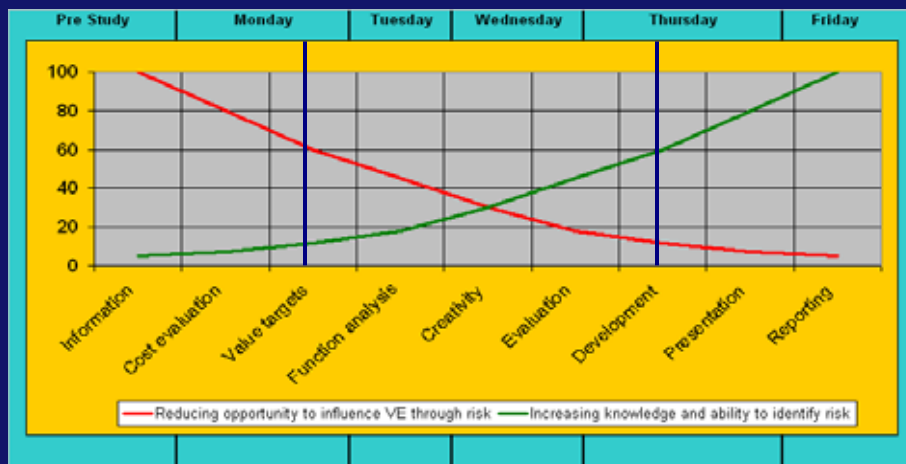
- **Not part of 'SAVE' job plan**
- **Too little time**
- Side tracks traditional structured approach
 - Some truth in this – workshops on large schemes already extremely challenging to achieve objectives in 40 hours

However ...failing to acknowledge risk.....

- Missed opportunity !
- Potential to miss greatest value savings



Window of opportunity





VALUE MANAGEMENT and Integral risk assessment

• The Workshop/Job Plan

- Information Phase
 - Function analysis
 - Creative Phase
 - Evaluation Phase
 - Development Phase
 - Presentation Phase
 - Reporting
 - Implementation
 - Post Project Review (Audit)
- Identify Risks
- Quantify Risks
- Mitigate Risks



What ARE THE GREATEST risks

Have we at least one VE idea to mitigate those risks



VALUE MANAGEMENT

Options:

½ day combined risk and value review

1 day VE review with existing team

1 – 2 day VE review with 'outsiders'

2-3 day VE review with 'outsiders'

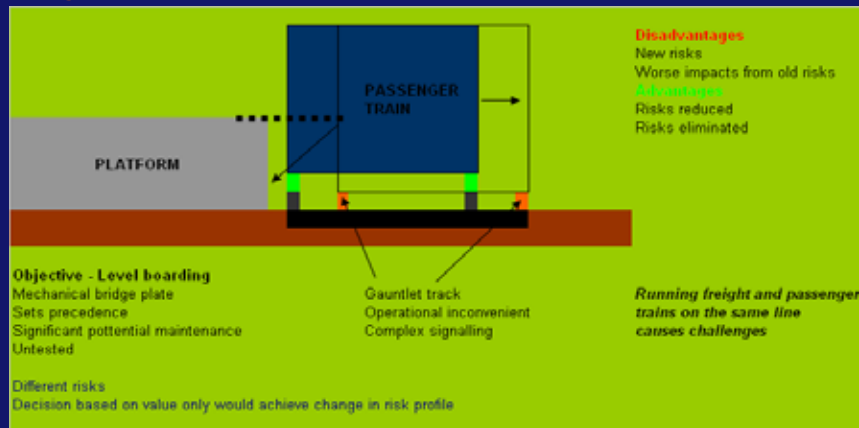
40 Hour independent team

40 Hour combined team



Amalgamating risk with value

- The 'gauntlet' track example





WHAT QUESTION (S) IS THE VE STUDY BEING ASKED TO EVALUATE

- > DEVISE ALTERNATIVE WAYS TO BOARD TRAIN
- > REDUCE RISK OF FREIGHT TRAIN AND PLATFORM IMPACT
- > IMPROVE PASSENGER SAFETY
- > REDUCE SIGNAL COSTS
- > IMPROVE OPERATIONAL FLEXIBILITY
- > PROVIDE LEVEL BOARDING DISABLED ACCESS

HOW MANY OBJECTIVES SHOULD BE CONSIDERED ?

SHOULD THE STUDY CONSIDER CHANGE TO THE RISK PROFILE ?



Ulverston, English Lake District - 5 day study (7 workshops)

Risk of non compliance

- Continuing (mostly ground) pollution
- Operating license suspended
- Fines
- Loss of jobs
- Loss of product and revenue

Value savings

- Lots of alternatives
- Prioritization essential
- Different degrees of treatment – evaluation of achieving environmental compliance followed by improved site operating processes

Evaluation – Alternatives available – reduced risk profile



Causes of violations:

- Spillage from barrels
- Spillage from tanker unloading
- Overflow of tanks
- Lack of containment
- Leaking pipes and valves

Solutions:

- Remove all redundant pipework
- Label pipework
- Replace poor high maintenance valves / standardize valve types
- Bunds to contain spillages
- Tank level overflow warning switches
- Driver unloading training
- Change in operating procedures

Why risk linked to VE

1. More than one reason for a violation
2. More than one solution for each non compliance
3. Different solutions provided varying levels of improvement at varying costs



Amalgamating risk with value

- DERA military research facilities UK (Farn/b, Chertsey, Malvern)
 - ¼ to 1 day workshops – at completion of ‘viability stage’
 - Sponsor input
 - Objectives
 - Project schedule, budget and value drivers
 - Interfaces
 - Constraints
 - Risk and scoring
 - Value idea generation
 - Procurement strategy analysis
- Typical value of projects \$20M to \$200M



Amalgamating risk with value

- DERA military research facilities UK (Farn/b, Chertsey, Malvern)
 - ¼ day workshops – with Design and Build Contractor on board
 - Existing design team
 - Sponsor input
 - Objectives
 - Project schedule, budget and value drivers
 - Interfaces
 - Constraints
 - Risk and scoring
 - Value idea generation
 - Partnering
- Typical value of projects \$20M to \$200M



Amalgamating risk with value

- Farnborough rationalization...VE study revealed
 - Landrovers stored in air conditioned garages
 - Constant 'highest' floor to ceiling heights used in all buildings
 - No 'sharing' of equipment between stakeholders
 - Scope running wild (2 gunnery chambers rather than one)
 - Common facilities duplicated

And all this gave rise to.....

- Inability to achieve schedule
- Significantly over budget



Amalgamating risk with value

MTO Ontario – Detroit / Windsor VACAS grade separation study

- Greatest risk was schedule
- Failure to have run schedule risk analysis would have not exposed schedule shortcomings
- Value solutions had to address risks of schedule delay as project objective was:
 - **Complete prior to system implementation and grade crossings blocked by trains - schedule critical**
- Risk analysis run in parallel with feedback throughout idea generation and development phase



Amalgamating risk with value

North Link – deletion of FIRST HILL station

- Significant problems with ground treatment at Beacon Hill – this could be worse
- Significant potential cost and schedule overage
- Highly sensitive property adjacent construction site
- Risk analysis ‘proved and underpinned’ the VE proposal to delete station



Amalgamating risk with value

WWTW Toronto – Ashbridges Bay WWTW

- Very constrained timescale – significant complex project for 40 hour workshop
- Address risk in middle of development phase –
 - Attendees asked to each write down Top 5 Risks
 - Facilitator collected risks and identified common risks
 - Presentation on what had been raised
 - Agreement of project top risks
 - Existing design team asked to confirm top risks
- Agreed top risks
- Are VE prioritized ideas capturing mitigation of top risks ?
- Presentation include risk reduction and linked ‘avoid flooding’ as basic function of project with key risk avoidance of ‘avoid flooding’



Amalgamating risk with value

OMB NY

- Typically very constrained timescales – common to be significant complex projects for 40 hour workshop
- Had to achieve objectives of SAVE protocol to comply with core accountability in 40 hour workshop – no specific remit to address risk separately
- Typically
 - Many stakeholders
 - Complex projects
 - Highly political
 - Schedule constrained
 - No risk registers developed by project team
- Risks addressed in pre study, prior to function analysis, in idea evaluation (as part of evaluation criteria) and throughout development stage
- Reports incorporated VE teams opinion of greatest risks



Pilot Plant, QA / QC Laboratory, Offices, CUB, Tablet Facility, Site Infrastructure restructuring

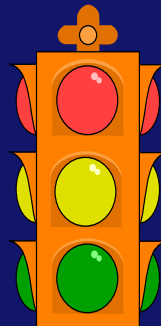
- End of PE
- Separate risk workshop / Separate Risk Analysis (prior to VE)
- 3 VE workshops – existing design team
- Evaluation Phase – existing design team 2 weeks
- Presentations – Idea prioritisation / Risk Review
- Further development Phase short listed ideas – 1½ weeks
- Final Presentation – Director instructions to implement changes



When looking at value address a wider range & combination of impacts


- Which are our greatest risks?

Grade
High Risk
Medium Risk
Low Risk



Impact types

- Likelihood
- Cost Impact
- Time Impact
- Business Impact
- Safety Impact
- Environmental Impact
- Security improvement



Risk Register

ID	WBS	Description	Prob	Cost	Time	Rank	Rank	Discussion
			%			Score	and	
1	Generic Route Wide	Poor weather - exceptional rain, snow or heat stops work (<u>limited snow removal equipment</u>)	12%	1	1	12	12	More extremes of weather common
2	Generic Route Wide	Liquidation of a key contractor stops work	1%	2	2	2	2	
3	Generic Route Wide	Undefined environmental constraints on construction - weather-usage / street closure time-avoiding hours-lab-co-parking-by-down work noise-dust-odor-etc.	Refer to specific risks	1	1	-	-	Quantified under each major structure
4	Generic Route Wide	Extent of replacement of small diameter water and sewer utilities greater than 10 year old - allowances may be insufficient (<u>balance works contract likely</u>)	100%	2	1	150	150	Any utilities older than 10 years are likely to require replacement - Water authority likely to insist on general water main and sewer replacement where disturbed by construction works - stated as 90% chance whole site replacement - 34" pipework likely to require protection
5	Generic Route Wide	Extent, size and details of noise barriers around construction sites unknown	100%	3	1	200	200	
6	Generic Route Wide	Inflation 'spikes' above projected trend in one or more trades	Quality annual inflation	1	1	-	-	
7	Generic Route Wide	Significant Archeology find stops work	2%	2	3	3	3	Duration of tunnel excavations possible

DAVIS LANGDON: Risk & Value Management October 24th 2006 27



Today's major risk ...Escalation

- **The Immediate Issues**
 - Major natural disasters
 - Material cost increases
 - Bid market disruption
 - High volume of construction work
 - Regulatory climate
- **Upcoming Issues**
 - Continued high demand for construction
 - Shortage of labor
 - Global economy

DAVIS LANGDON: Risk & Value Management October 24th 2006 28



Will Willson
Risk Analyst

DAVIS LANGDON
1717 Arch Street
Suite 3720
Philadelphia, PA 19103
Tel: 215-564-3104
Fax: 215-564-3109
Cel: 484-467-2524

wwillson@davislangdon.us