

Deriving Certainty from Uncertainty (Value from Project risk and Contingency Management)

PGCS Canberra 20 & 21 August 2019



Understand and
manage your risk

Outline

- Why undertake PROJECT risk management?
- Value – Some thoughts on measurement
- KISS processes
- KISS toolsets
- Contingency
- Integration – Management and Governance
- Cost
- Value Summary



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Quick poll

- Who is operating at:
 - Project Manager level?
 - Programme or Portfolio Level?
 - Enterprise Risk Managers?
 - Any CFOs?
- Is your organisation an:
 - Asset Owner?
 - Contractor?
 - Consultant?



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Why PROJECT risk management?

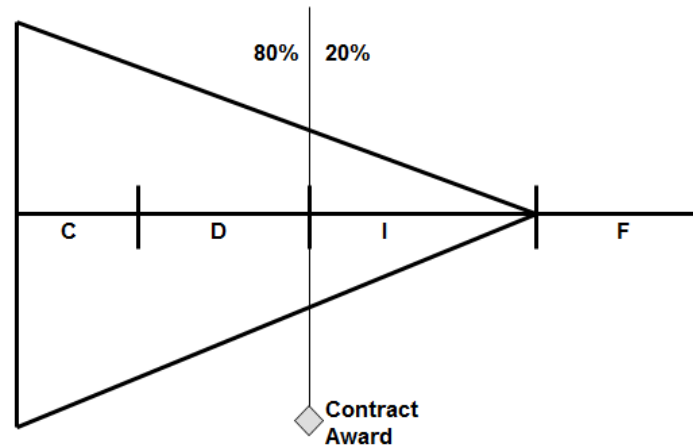
Project risk management requires a different approach to “Operational” risk management:

- A rapidly changing risk profile



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A rapidly changing risk profile



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Why PROJECT risk management?

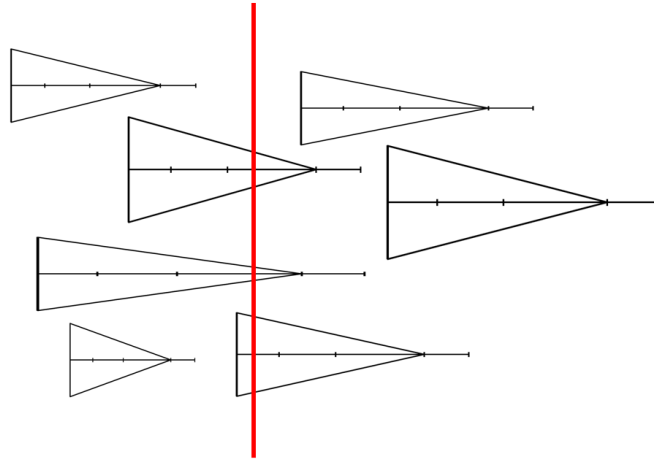
Project risk management requires a different approach to “Operational” risk management:

- A rapidly changing risk profile
- Projects of different size and overlapping cycles



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Projects of different size and overlapping Cycles



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Why PROJECT risk management?

Project risk management requires a different approach to “Operational” risk management:

- A rapidly changing risk profile
- Projects of different size and overlapping cycles
- Management at various levels – project, programme, portfolio and executive
- Consumes precious capital



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Why undertake PROJECT risk management?

- **Improved decisions (better information)**
- **Ability to make decisions earlier**
- **Improve the potential for project success**



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Risk Management Maturity

Continuum	Capability Attributes	Method of Achievement
Optimising	(Continuous feedback) Risk management a source of competitive advantage	<ul style="list-style-type: none"> • Increased emphasis on exploiting opportunities • “Best of class” processes • Knowledge accumulated and shared
Managed	(Quantitative) Risks measured/managed quantitatively and aggregated enterprise wide	<ul style="list-style-type: none"> • Rigorous measurement methodologies/analysis • Intensive debate on risk/reward trade-off issues
Defined	(Qualitative/Quantitative) Policies, processes and standards defined and institutionalised	<ul style="list-style-type: none"> • Process uniformly applied across the organisation • Remaining elements of infrastructure in place • Rigorous methodologies
Repeatable	(Intuitive) Process established and repeating; reliance on people continues	<ul style="list-style-type: none"> • Common language • Quality people assigned • Defined tasks • Initial infrastructure elements
Initial	(Ad Hoc/Chaotic) Dependent on heroics; institutional capability lacking	<ul style="list-style-type: none"> • Undefined tasks • Relies on initiative • “Just do it” • Reliance on key people



Source: Protiviti 2006

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Value – some suggested ways of measuring

- **Efficient:**
 - processes
 - toolsets
- **Effective: Processes and toolsets that enable:**
 - Informed decisions
 - Timely decisions
 - To be made at the right management level
- **At an appropriate cost**



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So let's start with process

- **What do you record in your risk register?**



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Risk management

- The AS/NZS 4360 or ISO 31000 have the same founding process:
 - Context
 - Identification of a risk
 - Analysis
 - Likelihood (of occurrence)
 - Impact (on objectives)
 - Treatment(s)
 - Monitoring (responsibility) and
 - Control (action/review date)
- The key is that you do not need anything else! (KISS is our mantra!!)



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You do not need items such as:

- Residual risk
 - Risk Owners
 - Exposure
 - Risk Appetite
 - Aggregation – will touch on this shortly
 - Consequence tables etc
- to manage risks effectively
 - and certainly do not need them if you want to manage risks efficiently!!
 - You will get resistance – it is not why any of the above may be needed – the question should be can I manage risks without them.



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Context – Risk Breakdown Structure (RBS)

- Management
 - Procurement
 - Approvals
 - Reporting
- Commercial
 - Variations
 - Programme
 - Financing
- Constructability
 - Assembly areas
 - Access etc



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ISO 31000 2018 – A Guidance document

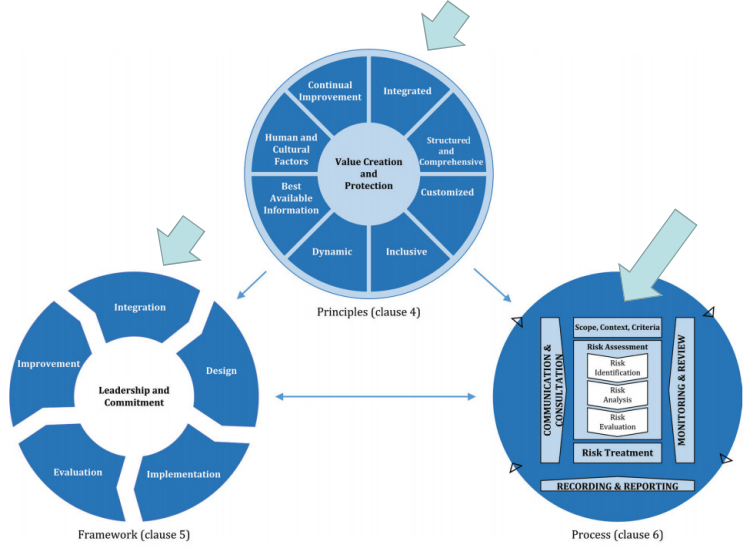


Figure 1 – Principles, framework and process



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Describing a risk

The Guide to the old AS/NZS 4360 had a very succinct (KISS!!) way of describing a risk:

- (Something happens) leading to (outcomes expressed in terms of impact on objectives)

One essential component that is often missing is Objectives.

- ISO31000 definition of Risk – *effect of uncertainty on Objectives.*



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Objectives – what should they look like?

- SMART?
- Whatever your definition two aspects are essential:
 - Measurable (how else do you know what you are trying to achieve and demonstrate you have achieved it)
 - Time bound (when are you going to complete the activity/project)
- Analysis enables objectives to a key part of the process:
 - Impact (if a risk occurs) on objectives



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Analysis Guide - Likelihood

Likelihood	Description - general	Description - project	Indicative frequency
Almost Certain	The event will occur on an annual basis	Can be expected to occur during the project	Once a year
Likely	The event has occurred several times or more in your career	May occur during the project	Once in 3 years
Possible	The event may occur once in your career	Has occurred on an earlier project	Once in 10 years
Unlikely	The event does occur somewhere from time to time	Could but not expected to occur during the project	Once in 30 years
Rare	Heard of something like this occurring elsewhere	Conceivable but highly unlikely to occur during the project	Once in 100 years



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Analysis Guide - Impact

Scale	Financial - %cost overrun from contract price	Project	Time % overrun from planned
Severe	20 +%	Most objectives cannot be achieved	20 +%
Major	10-20%	Some objectives cannot be achieved	10-20%
Moderate	5-10%	Some objectives affected	5-10%
Minor	2-5%	Minor effects that are easily remedied	2-5%
Insignificant	0-2%	Negligible impact upon objectives	0-2%



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Treatments

- Each Treatment must have:
 - An Owner
 - An Action/Review date
- After workshops Treatments are where the real risk management occurs!!



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Integration - the role of Objectives

- Project Objectives will:
 - Be more detailed than Programme objectives
 - Be subordinate to but support Programme objectives
- Programme Objectives will
 - Be more detailed than Executive (eg Business plan) objectives
 - Be subordinate to but support Executive objectives
- Similarly for Portfolios
- Objectives enable an updating of the Analysis of those risks that are rolled up to the next level.
- Note this is not a process that can be automated!!!



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Effectiveness (and benefits)

- **RBS**
 - Consistent approach – workshops structured with ownership and improved understanding of project by stakeholders
 - Ability to cut and dice information (eg identify systemic risks)
 - Can be applied to any Risk Management in an organisation
- **Objectives**
 - Process helps to refine objectives and stakeholder understanding
 - Integrates Project with other management levels (eg Programme)
 - Overcomes the problems associated with the one size fits all of Consequence tables



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The need for a specific toolset includes:

- Easy collection of data particularly in a workshop environment (ie one screen for data entry)
- Easy updating of data
- Ensuring data integrity (ie single responsibility for data but wide spread access to reports)
- Ready sharing of data (internally and externally)
- Reports that enable effective management
- Being readily accessible wherever and whenever people might be working
- Etc etc.....

- All of which points to a Cloud database solution.



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Standards, Processes and Toolsets



Should work from the "bottom" up



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RiskOrganizer – single data entry screen

Manage Identification

Title: Sewer Main Rehabilitation (Gavin)
 RBS: Main Construction Contractor Questions(Project) Manager: Group: Region: Business:

Risk# 1 Higher management attention? Opportunity? Cost Impact Closed?

Area: Occupational Health & Safety Category: Operating handtools

Question: please select

Risk Name: unauthorised public access to site occurs leading to injury.

Notes: Accident resulting in serious injury to member of the public. Delays to project, legal action and costs against Principal and contractor. Reputation risk.

Current Analysis: **Moderate**

Likelihood: Unlikely Impact: Moderate Urgency: Current Processes:

Initial Analysis: **Moderate**

Likelihood: Unlikely Impact: Moderate Date: Wed Jun 27 2007

Treatment: Sub-contractor to have OHS&E plan approved prior to start work. Ongoing surveillance.

Responsible: Gavin Halling Due: 27/01/2008 Cost: \$0.00

Notes: Resource Notes

Completed

Navigation: Previous Page 1 of 1 Next

Analysis ↑ ↑ Treatments



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Reports numerous filters and reports

The screenshot displays the 'Reports' section of the RiskTools software. On the left, there is a 'Filter Projects' section with dropdown menus for Project status, Project Managers, Project Groups, Regions, and Business. Below this is a 'Filter Risks' section with dropdown menus for Risk status, Risk Type, Responsible persons, RBS, Risk Rating, Likelihood, Impact, and Other. At the bottom left, there is a 'Report filters:' label. In the center, there is a 'Default' button and a 'Management related report' section with a list of checkboxes for various reports. On the right, there is a 'Project related report' section with a list of checkboxes for various reports. At the bottom, there are buttons for 'Sort Order', 'Download', and 'Email Reports'. The RiskTools logo is in the bottom left corner, and the slogan 'Understand and manage your risk' is in the bottom right corner.

Effectiveness – How software assists

- **Reports that focus on:**
 - Project risks and
 - Management of risks
- **Reports that can be filtered to suit specific requirements**
 - Analysis or rating
 - Status of Treatments
 - Inter-project comparison
 - Who needs support?
 - RBS
 - Programme Managers
 - Line Managers
- **Access at any time – ie when information is needed**

Contingency

A quick poll:

- Who is undertaking cost contingency?
- It has been a driver of cost management since 2008:
 - Department of Infrastructure, Transport, Regional Development and Local Government
 - *Best Practice Cost Estimation for Publicly Funded Road and Rail Construction*
- More recently:
 - Risk Engineering Society and Engineers Australia
 - *Contingency Guideline (2nd edition Feb 2019)*



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Contingency

- Contingency = cost of carrying risk
- Two elements:
 - Contingent risk – those risks that may happen – derived from qualitative workshops
 - Inherent risk – those risks associated with work that has to be done to undertake the project as detailed in the project estimate. Inherent contingency reflects the uncertainty associated with the estimate (quantities and/or rates).



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Example of how some are assessing Contingent risk

- Take likelihood (eg 40% probability)
- Assess worse case (eg \$100,000)
- Combine (40% * 100K = \$40,000 contingency allowance)

- What's wrong with this?
 - 60% of time risk will not occur
 - Worse case rarely occurs and certainly not for all risks



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Contingent risk

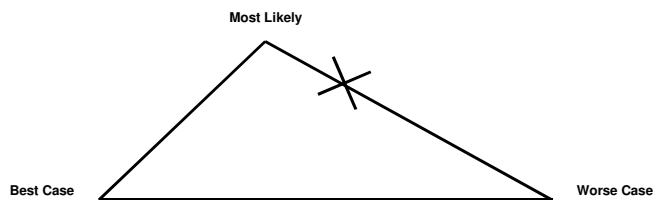
- How to assess?
 - Same as before:
 - Assess likelihood (eg 40%)
 - Assess worse case (eg \$100,000)
 - But also assess:
 - Best case and most likely values
- Only consider risks with direct cost implications
- Undertake a Monte Carlo simulation



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Monte Carlo simulation

Selects risk based on likelihood (will call up risk 40% of the time but 60% of time will not be applicable = 0)
 Takes a value at random between best case and worse case but weighted towards most likely (based on area of triangle)



Totals the value for all risks

Repeats the exercise 1000 times (say) – ie it models the likely total value of risks



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RiskValuer (RiskOrganizer’s inbuilt MC model)

RBS: Main Construction Contractor Questions[Project] Manager: Group: Region: Business:

Risk# 2 Higher management attention? Opportunity? Cost Impact Closed?

Area: Occupational Health & Safety Category: Operating handtools

Question: please select

Risk Name: Unseasonal wet weather conditions preclude access for work on live sewers

Notes: Delayed project completion. Project management costs, site supervision and site restoration.

Likelihood (percentage) 60% **1** Best Case \$5,000 **2** Most likely Case \$7,000 **3** Worst Case \$30,000 **4**

Current Analysis: High

Likelihood: Unlikely Impact: Severe Urgency: Current Processes:

Initial Analysis: High

Likelihood: Unlikely Impact: Severe Date: Wed Jun 27 2007

Treatment: Allow 6 weeks float in schedule.

Responsible: Gavin Halling Due: 27/03/2008 Cost: \$0.00

Notes: Resource Notes

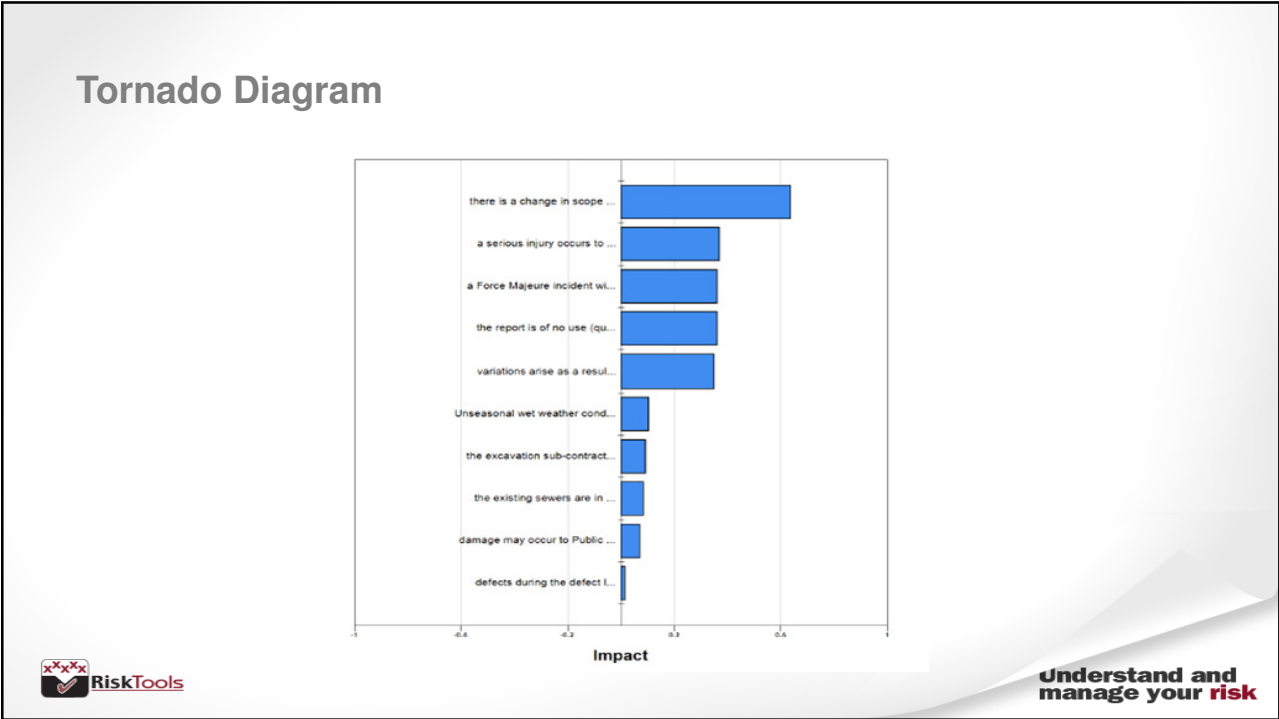
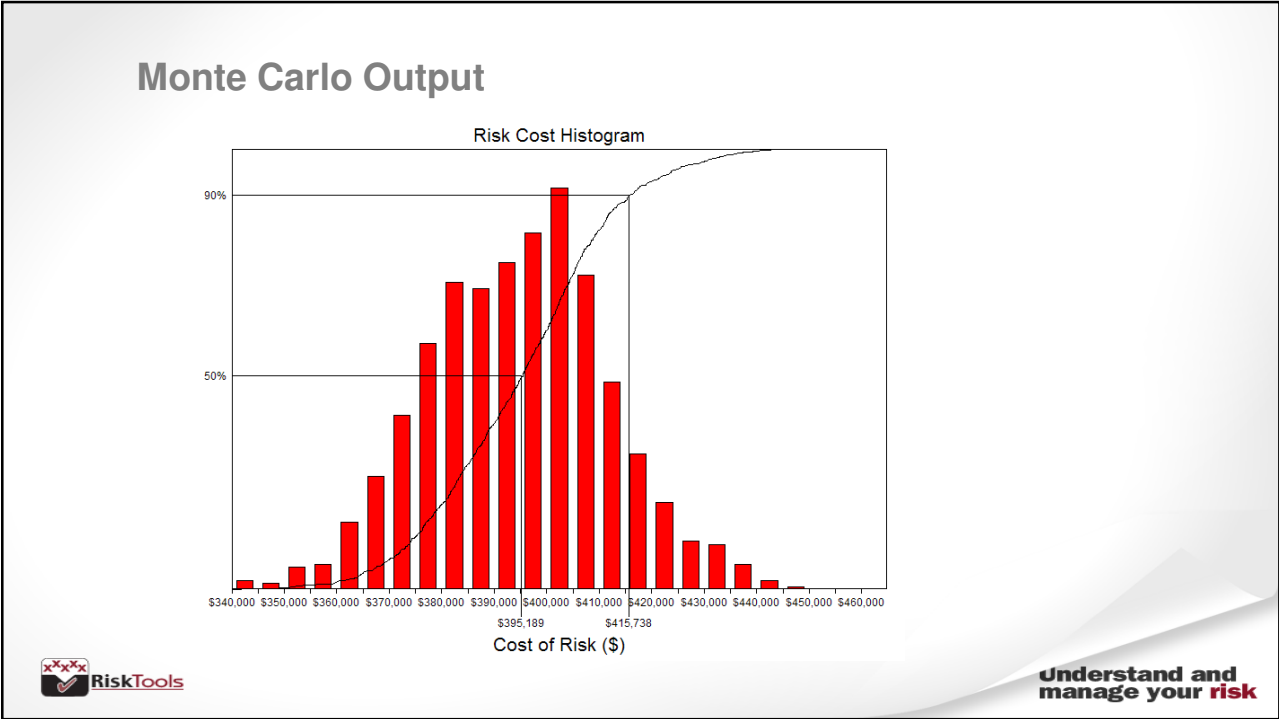
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Number of Iteration: 1000

Run simulation



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Inherent risk contingency

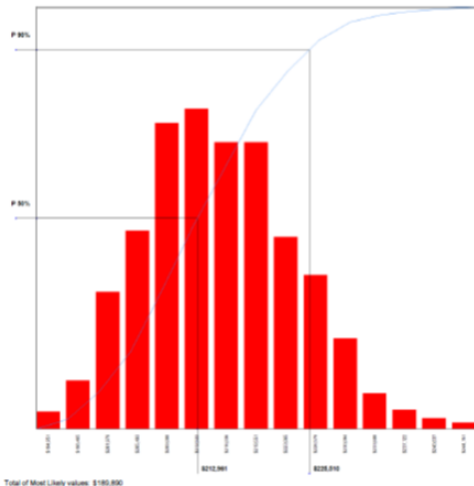
- Develop a model that enables a range of quantities and rates to be assessed (ie Best case and Worst case for each item in the estimate)
- The Most Likely value will be the original estimate value
- Hold an “inquisitorial” workshop so that data accuracy may be tested and potentially omitted items identified.



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Histogram Output

Total of Most Likely values: \$189,890
 P50 Inherent contingency: \$23,071
 P90 Inherent contingency: \$35,620



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Estimates

- The above processes quantify the costs of Contingent and Inherent contingency
- Need to ensure no “double dipping” within and between the two processes (eg LDs)
- P50s and P90s may then be added from both processes to obtain an assessment of the most likely cost of carrying risk
- (Values other than P90 can also be selected)



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Use of P50 and P90

- The P50 value represents the expected cost of carrying risks
 - At a point in time (when the simulation is run)
 - The actual end result may be a little over or under P50
 - More conservatively the P90 is that point below which 90% of the iterations fell.
- Usage depends on your business
 - A Tenderer will probably use P50
 - An Asset Management company may use P90 for Board approval
 - The Project Manager will normally only be authorised P50 for risk. The difference between the P90 and P50 may be held by senior management as a reserve.
 - If the Project Manager requires additional funding to cover risks, then an additional approval processes is required to access this “reserve” fund.



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Benefits

- A simple process that is easy to follow and quickly undertaken
- Visibility in the values used for deriving contingency
- The ability to see which risks have the greatest effect on the bottom line. This helps to prioritise which risks should be addressed first
- Improved stakeholder confidence due to a visible process
- The ability to amend and update data very quickly to accommodate changes
- Reduced stress levels – (if someone doesn't like the bottom line they can suggest and take responsibility for changing the inputs!)



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Efficient and Effective

Efficient:

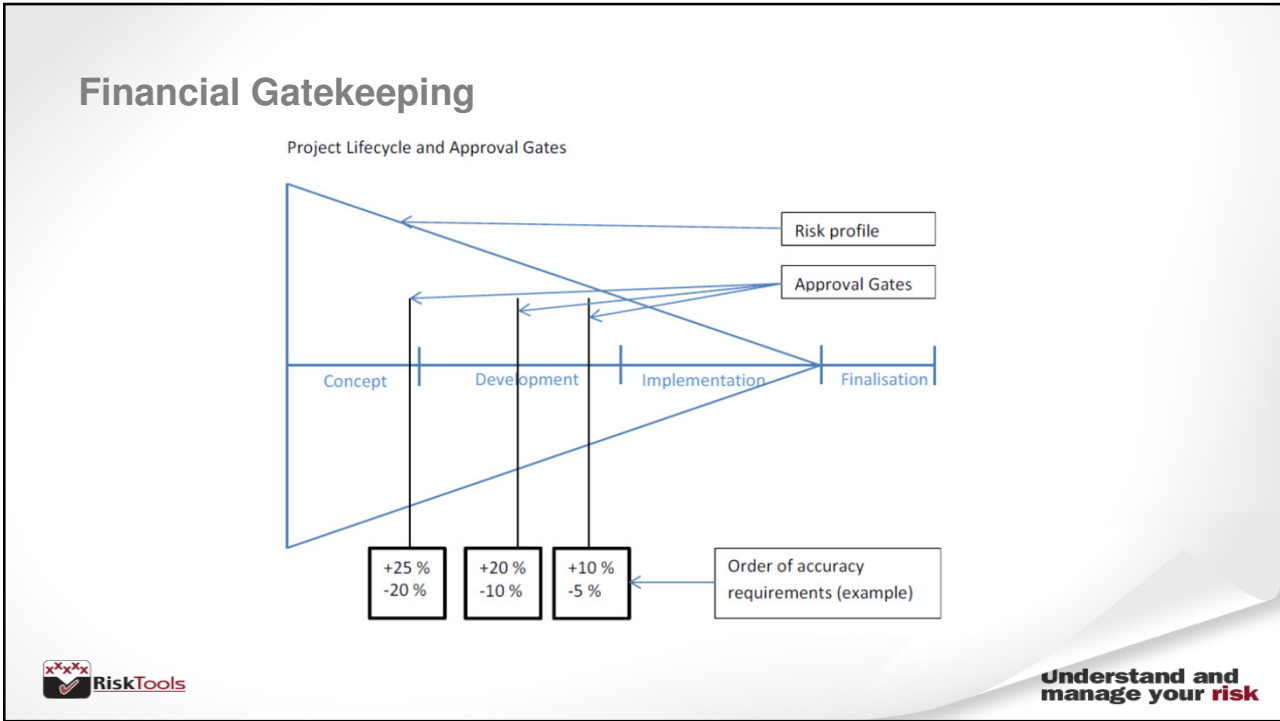
- Data management and simulation all in the hands of the project team.
- With CE others can also run simulation at any time and for any combination of projects.
- Can run simulation whenever you want at anytime.

Effective

- Encourages a team approach – shared understanding and ownership
- Produces immediate results and enables a focus on what to work on next
- Visibility – improved stakeholder confidence



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Example

- **Inherent outputs:**
 - Total of Most Likely values (ie the base estimate) \$190,000
 - P50 Inherent Contingency \$ 20,000
- To this needs to be added the P50 for Contingent risks.
 - Let's say this was \$25,000.
- Hence, total Contingency would be \$45,000
 - some 24% of the base estimate.
 - OK for first Gate but exceeds the boundaries for the second and third gates.
- So what would you do?

RiskTools

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Capital funding & Cash flow management

- Normally PMs hang on to any Contingency for as long as possible (just in case....).
 - Single project may not be a big issue but
 - over many projects a substantial amount of money may be held within projects that does not get released until each of them is completed.
- Easy and regular Contingency updating
 - the amount held within projects may be reduced much sooner than waiting until the end.
- Over a programme of projects can mean the release of some sizeable funds. Could then commit to (say) a new project or projects much earlier than would otherwise be the case.



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Risk Management Requirements – Project Level

- Meeting Gatekeeping obligations (Risks and Budgets)
- Monthly reporting
- Monitoring/management of Treatment activities
- Prioritising work (eg High/Significant, Timeline for Treatments, risks with large financial impact)
- Once approved forecasting project end cost

- Also those risks that may impact next level of management (eg Programme)



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Risk Management Requirements Programme/Portfolio level

- **Specific Programme level risks (may be a separate part of RBS) such as:**
 - Integration of projects in programme
 - Funding
 - Resources
 - Stakeholders
 - Communication
 - Timelines etc
- **Specific risks of projects within programme:**
 - Higher Management Attention (eg affecting programme objectives)
 - High/Significant risk in projects
 - Systemic risks across programme (through RBS filter eg Commercial)
 - Managing programme contingency



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Risk Management requirements – Executive level

- **Focus is on Governance:**
 - Gatekeeping
 - Ongoing assurance that risk management is being undertaken
 - Management of cash and capital
- **No surprises!**



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Efficiency

- Least amount of data that enables risk management
- Repeatable, visible processes
- Simple intuitive toolset for entering and updating data
- Visible risk and contingency with reports designed to support ongoing Risk Management
- Minimum formal reporting needed as information may be obtained by anyone (with access) at anytime and tailorable to achieve specific needs
- Cloud based solution so wider Project team (eg outside organisation) can see data.



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Effectiveness

- Consistent approach – workshops and ongoing management
- Prioritisation of risks
 - Through risk analysis
 - Contingency outputs
- Integration
 - RBS
 - Objectives and risk through Management levels
 - Data may be uploaded to an Enterprise system (via a .csv file of User filtered data)
- Easy to use intuitive software
 - Saves time
- Visibility of risks and contingency
 - Stakeholder confidence
 - Improved assessment of capital requirements and cash flow management



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Costs

- RiskOrganizer starts at \$49 per month per User
- ContingencyEstimator start at \$20 per month per User
- Cost per User drops as User numbers increase - \$15 per month per User for both toolsets for 50 Users
- Real cost in project risk management is:
 - Inefficient processes which waste time (take too long, require rework, give incorrect results)
 - Cost of participants in workshops
 - Or
 - Not undertaking risk management!!!



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Value

- You now have some thoughts on how you can get value from Project risk and Contingency Management.
- What about your situation? Is what has been outlined an improvement on what you are doing - ie is it:
 - More Efficient?
 - More Effective?
 - And at least cost?
- If your answer is yes then.....



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Steps for you to consider

- Review the data you collect to manage risks
 - (is it really essential!)
- Throw away spreadsheets and get some purpose built software
- Document process
 - What, Why and How
- To help:
 - Leave your contact details
 - I will send you:
 - My eBook “Project Risk Management - A KISS approach”
 - Include you in Tip series
 - We would be happy to help so contact us (we will not chase you!)



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Questions?

If questions arise later I may be contacted at:

Gavin.Halling@Risktools.com.au or +61 (0) 411 552 006

More information is also available from the website:

www.risktools.com.au

Thank you for your time.



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