



Project Risk Management

In 44 & ½ minutes

This presentation has been prepared for the Actuaries Institute 2015 ERM Seminar.

The Institute Council wishes it to be understood that opinions put forward herein are not necessarily those of the Institute and the Council is not responsible for those opinions.

01 Why YOU are the most important person in the room



YOU

The way risk professionals are valued appears to be fluctuating

You can influence strategy – you just might not know it

A lack of understanding how to sell your value as a professional.

What if we changed your title?





Risk *sans* Safety

- This is **NOT** a safety presentation
- Today is about \$\$\$
- Today is about managing risk to **WIN**.



Why manage risk anyway?

ISO31000:2009 – Risk is the effect of uncertainty on **objectives**.

Our **objective is to win the bid/project/work**. We manage risk to win by managing:

- Bid and estimating risk to successfully **win the contract**
- Project risk to increase margins and **win greater profits**
- Commercial risk to **win a competitive advantage**
- Operational risk to **win the respect of our stakeholders**.

02 The Evolution of Risk Management



Traditional Approach





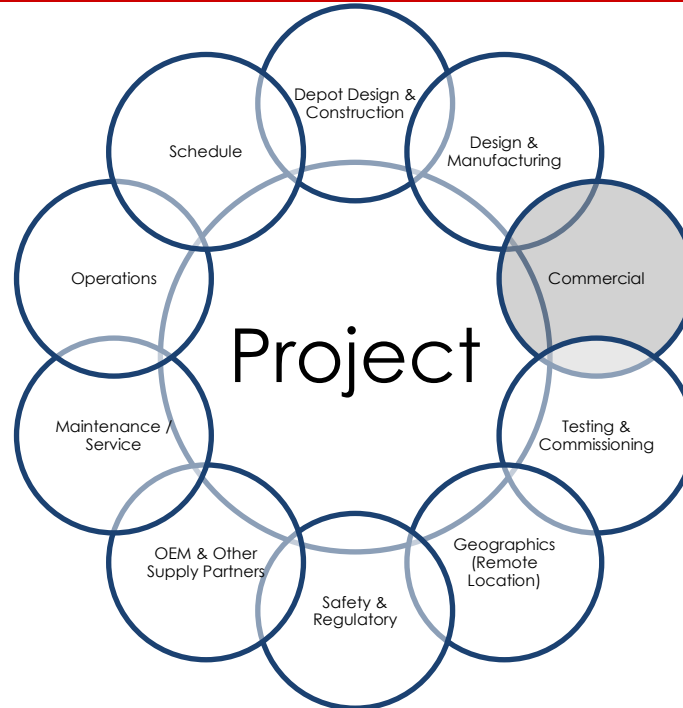
Contemporary Approach



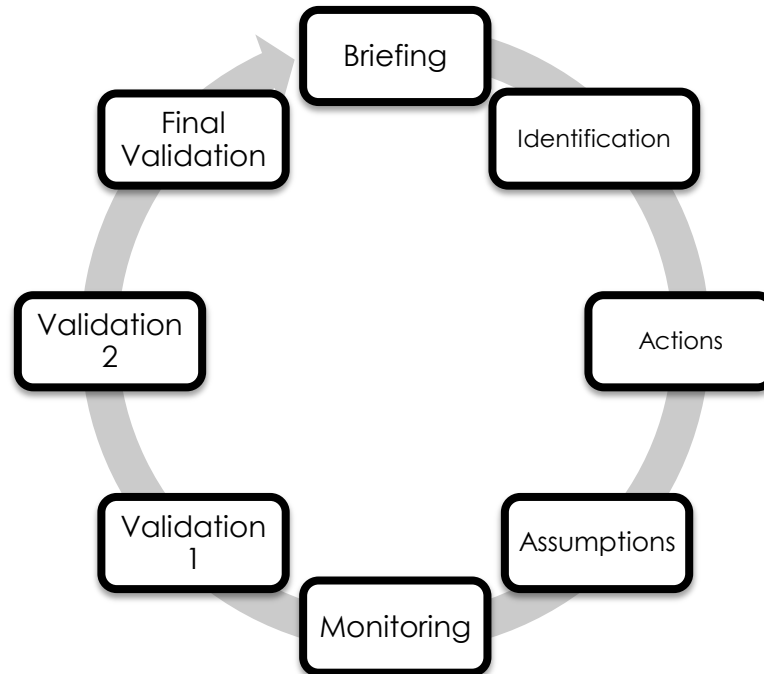
03 A Quick Project Risk Masterclass



Project Example - Streams

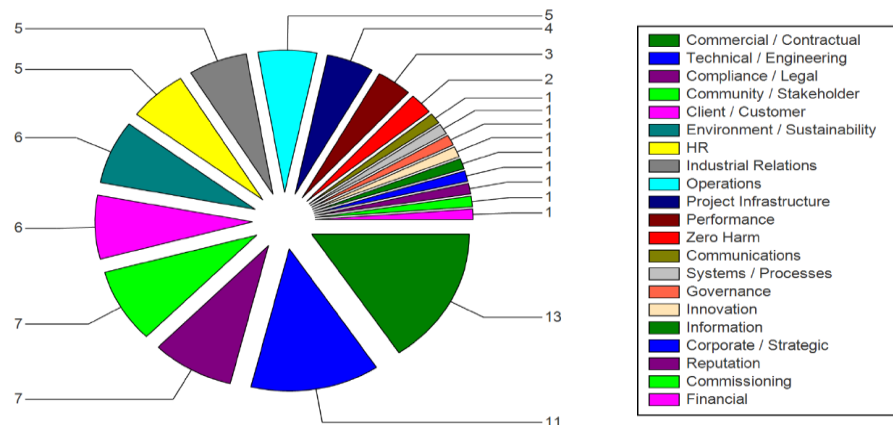


Interactive Sessions



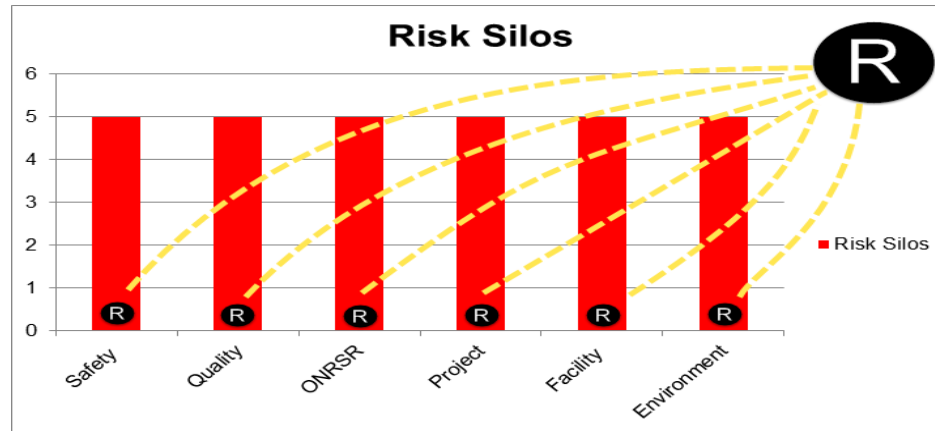


What's inside the portfolio



Connectivity

What if you could design and implement a system that could extract the risks out of project silos and shine a spotlight on this connectivity to eliminate risks?





The Real Trick - Returning Contingency to Revenue

- Understanding exactly what uncertainties exist
- Identifying which 'stream' they sit in
- Knowing who owns them
- Discovering what drives them
- Estimating the **range** of exposure
- Investigating every opportunity to mitigate the exposure.

Unique Identifiers

Unique Identifiers – In Perpetuity

Information Technology (IT)

ARM Risk ID: 9661 RAIL Ref: Trigger 1/07/2016 Expiry 1/07/2018

Risk Description				Risk Owner	Causes
(COMMERCIAL) (IT) The Current status of capability is insufficient to measure and enforce the contractual and commercial requirements of the Joint Venture				Stephen	No systems in place to automate and report on time running measurements. There appears to be no historical mapping of the IT capability - More specifically the risks are: 1. Business requirements & deliverables not clear, or change during the project 2. Lack of robust test management 3. Lack of understanding of the impact of changes on KR business processes 4. Ineffective communication, change management & training 5. ABAP work not all completed before testing starts 6. Customisation complexity not carefully managed 7. Increased execution and master data effort does not exceed benefits of a more sophisticated maintenance system 8. Business does not accept / cope with change 9. Increased cost to support and maintain the system 10. Business champions not available at design and build stage 11. Lack of confidence in maintenance team in understanding the blueprint and overall solution 12. Partnership with bid partners causes rigid or political project leadership - causes slow project decisions for example 13. Inaccurate or incomplete job estimation and reporting
Rating	Likelihood	Consequence	EMV	Risk Accountability	Effect
C	Unlikely	4	\$30000	John & Peter	Performance improvements. Ability to report against the current system into the workable model. Additional costs in reconfiguring

ID	Sub Task Detail	Task Owner	Start Date	Due Date	% Complete	Forecast Completion	Notes	Status
18800	Check the contract for the penalty applied for not being able to report	Stuart Phillips	1 Jul 2015	31 Jul 2015	50%	31 Jul 2015		In Progress
19079	Investigate whether the SAP environment can capture the required data	Stephen Barnabagioti	9 Jul 2015	31 Jul 2015	0%	31 Jul 2015		In Progress
19080	Engage temporary resource for two days to ensure insurance around the existing environment	Stephen Barnabagioti	9 Jul 2015	31 Jul 2015	100%	31 Jul 2015		Complete
19081	Planning day on the 15th & 16th July	Stephen Barnabagioti	9 Jul 2015	9 Jul 2015	100%	9 Jul 2015		Complete

Escalated advices via outlook ensuring the risk management process is assured

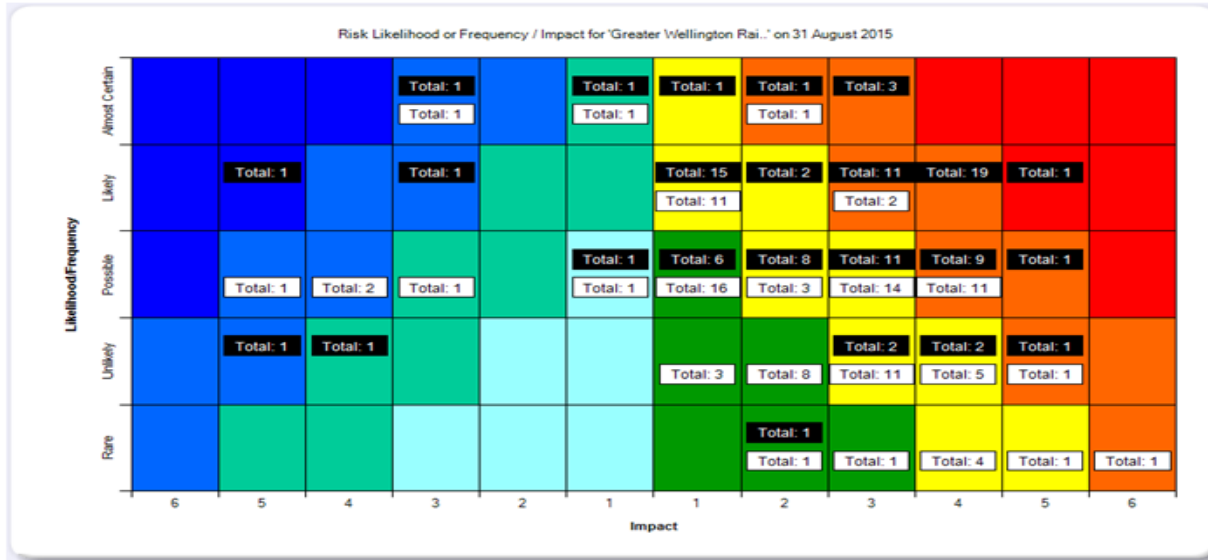
Track % Complete

Complete

Each Task is unique

Key Dates

Probability Impact Diagrams or “Heat Maps”



The **'black'** position of the unique identifier represents the pre mitigated position of the discreet risk whilst the **'white'** position represents the impact post mitigations

3 Point Estimates & Monte Carlo's (Not the Biscuit)

Three point estimates for each risk are generated by the SMEs and modelled which generates a probability distribution curve based on the BetaPert distribution.

This distribution is similar to a 'normal' distribution curve, but it can be generated from three point estimates on the curve, and is widely used within risk management systems.

The individual risk distributions are then combined (called a convolution sum) to give an overall probability distribution. The distribution is then used in a Monte Carlo type simulation to generate a range of outcomes.

The screenshot shows a risk management software interface with the following details:

- Assessment Rationale:** A text box explaining the risk: "We assume that we offer 2.75% and VPI is at 3.00% or potential over to 4.00% this represents a range of between 25% and 1.25% every 4th year of the 20 years of the contract. This % is the increase each employee would receive on their hourly rate. We do not have to worry until 2021. Assuming the base salary for all ActTrade staff at the 1st July 2021 is \$7,066,908 and then at 2025 / 2029 / 2033 and to 2039. So - the expected wages at the minimum (25%) exposure for years 2021 to 2037 is 7084,605.35 / 7102,316.86 / 7120072.65 / 7137872.83 and for the last two years 2037 - 2039 / 7176765.17 (Min = 17,567.34 + 17711.51 + 17755.92 + 17800.18 + 8922.34 = 79,857.29) (MLC = 53002.02 + 53134.53 + 53267.76 + 53400.54 + 26,767.02 = 212,672.07) Max = 88,336.70 + 88,557.55 + 88,779.60 + 89000.80 + 44,611.70 = 533,026.45) Applied MIN @ 25, MLC at 75% and Max at 1.25% with our treatments and action plan reducing the exposure to the between the MIN and MLC."
- Impact Start Date:** 01 July 2021
- Impact End Date:** 01 July 2037
- Target Resolution Date:** (empty)
- Scoring Scheme:** Group, Black Flag, None
- Current Rating:** Beta Pert, Exposure: Risk, EMV(AUS): 173,024.13
- Target Rating:** Beta Pert, Exposure: Risk, EMV(AUS): 110,819.34
- Likelihood Table (Current Rating):**

	Min	Most Likely	Max	Possible
Financial (AUS)	79,857.29	399,286.45	399,286.45	1
Health & Safety	0	0	0	NIL
Env & Community	0	0	0	NIL
Brand & Reputation	0	0	0	NIL
Mgmt / Organisation	2.5	2.5	2.5	3
Legal & Compliance	0	0	0	NIL
- Likelihood Table (Target Rating):**

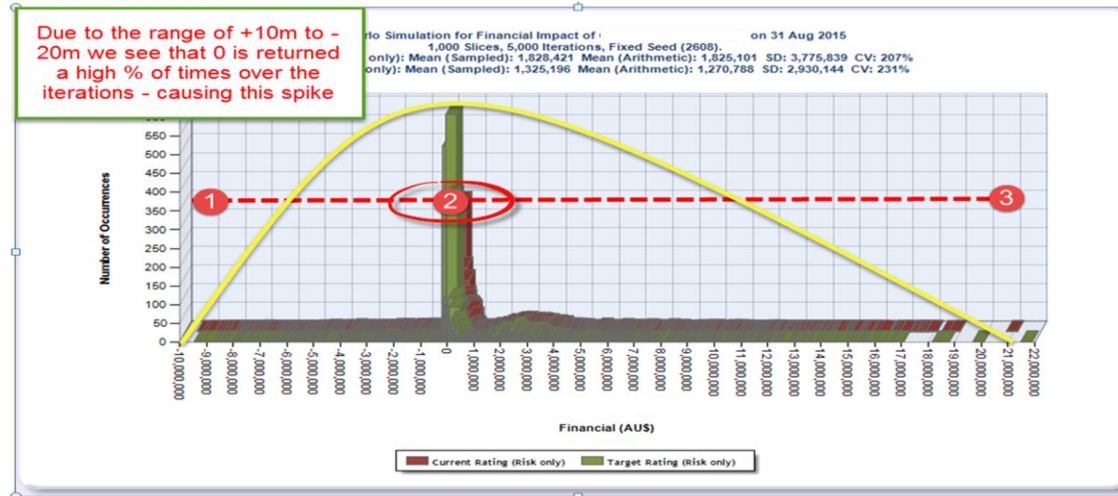
	Min	Most Likely	Max	Possible
Financial (AUS)	79,857.29	212,672.07	399,286.45	1
Health & Safety	0	0	0	NIL
Env & Community	0	0	0	NIL
Brand & Reputation	0	0	0	NIL
Mgmt / Organisation	2.5	2.5	2.5	3
Legal & Compliance	0	0	0	NIL
- Risk Level:** C: 13

Price risk with the key stakeholders by applying a 3 point estimate.



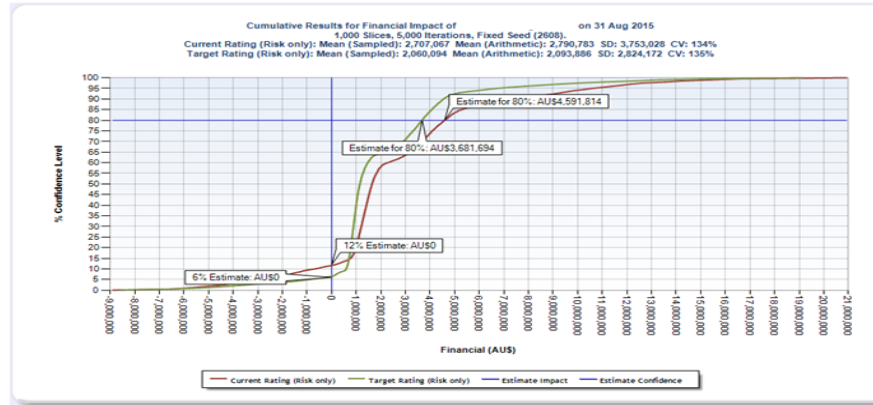
Validate the assumptions by evidence or reasonable hypothesis to arrive at a range of exposure

Monte Carlo – Simulation (Risks & Opportunities)



The spike is driven by the simulation when risk 9457 is considered. This is due to the range from + 10M upside to – 20m exposure being modelled in the risk portfolio and when the Monte Carlo simulation is applied

Monte Carlo – Simulation (Risks & Opportunities)



The 'red' line represents the pre mitigated P80 position of the quantified risk portfolio whilst the 'green' line represents the exposure post mitigations

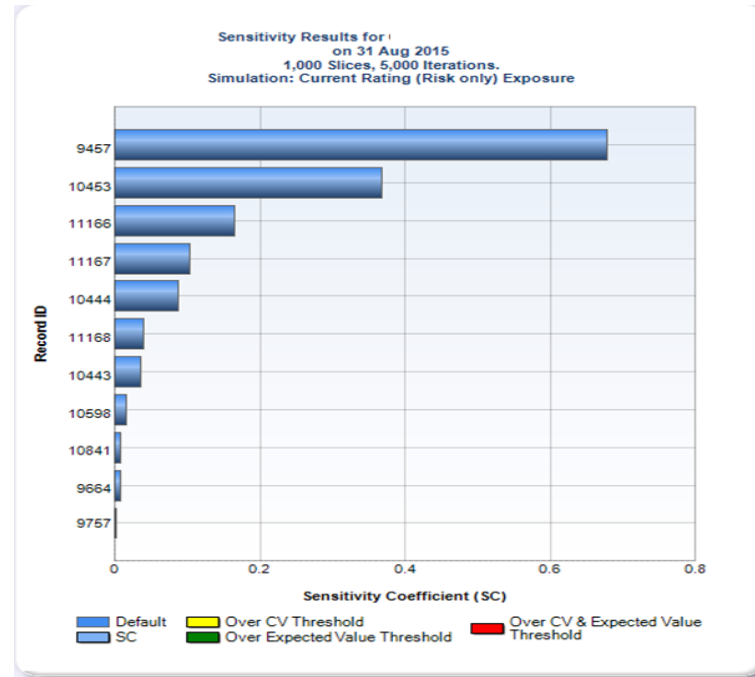
Whilst the range @ Silver was 4.591m NZD it was expected that the 'tail'* displayed will be less evident at silver as the range assumptions are refined. Range is now decreased btm 4.591m and 3.681m but the tail remains due to risk 9457

Note*

A long-tail distribution will arise with the inclusion of values unusually far from the mean, which increase skewness. In a project sense this means a number of our risks have exposures well outside the mean and these will be addressed prior to Gold

Risk Sensitivity (Tornadoes)

Risk sensitivity allows STEERCO to identify which risks in their portfolio have the greatest **effect on the mean contingency** cost and this can re-focus the bid team to address those risks which have the greatest chance of affecting the overall contingent cost of the project.



With a confidence level of 80%, based on the information supplied by the team leads, the three point estimates and reliant on the assumption and scenarios discussed with the team the **provisional contingency** required for the life of the operations and maintenance contract is 4.591m NZD (Silver was 14.9m NZD)

04 Lets Assume ASSUMPTIONS & RANGE



What can we rely on ?

- Evidence
- Reasonable Hypothesis
- Assumptions



- Be wary of optimism bias
- Understand the 'Elephant Alpha' in the Room
 - Be sober, adult, professional and challenge

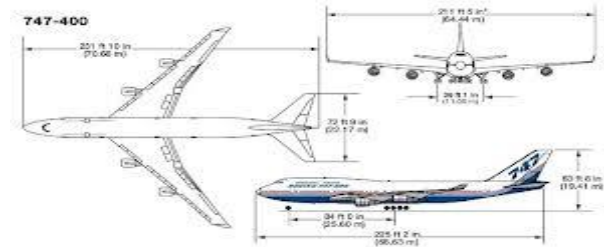


Simple Maths First

- A boy walks into a shop. He buys a bat and a ball.
- The bat costs \$1 more than the ball
- The total price is \$1.10
- How much did the ball cost?

Assumptions & Range

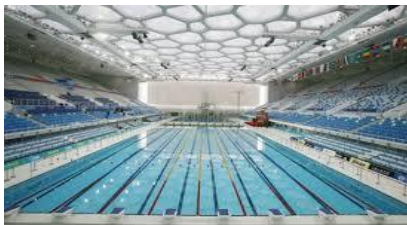
- Provide your 80 percent confidence interval - a number range within which you believe the answer lies, with 8 percent confidence, e.g. you believe there is a 10 percent probability that the true answer is higher, and a 10 percent probability that the answer is lower.
- For example, a 747's wingspan can't be one mile wide, for example, nor could it be as short as you are tall, say 6 feet.





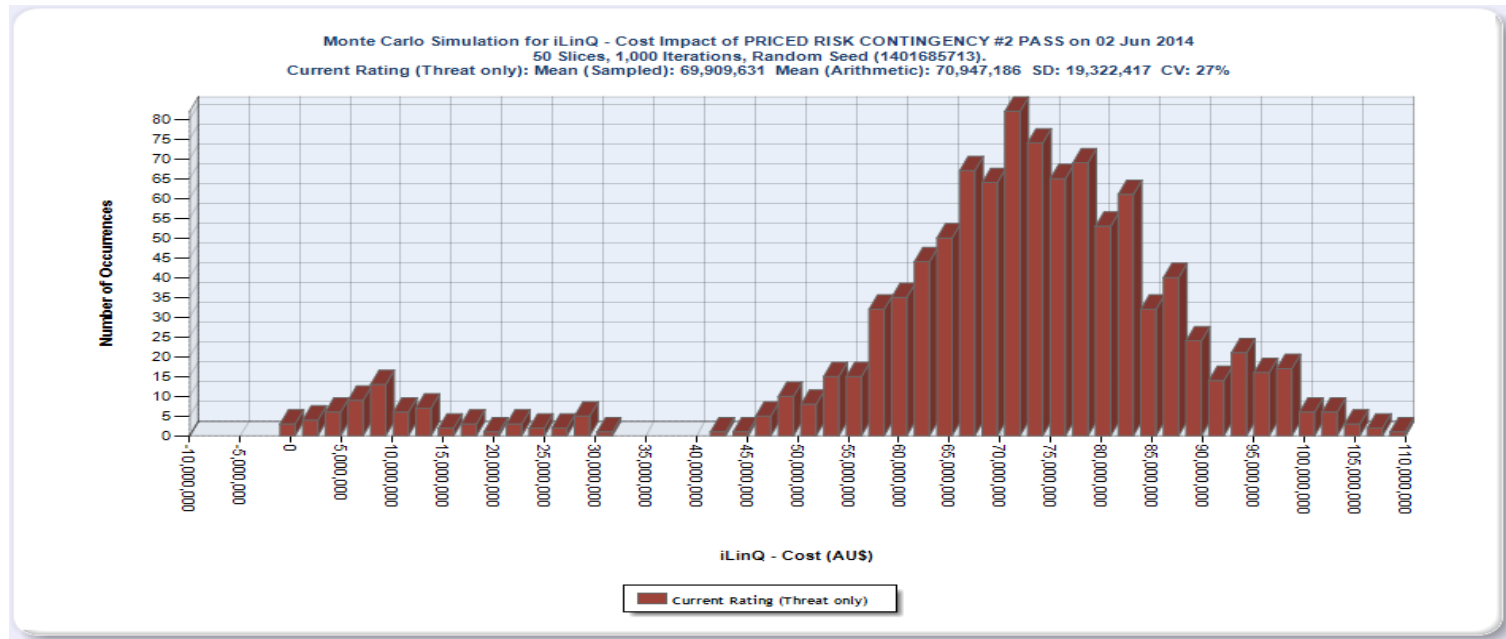
Assumptions & Range

Challenge

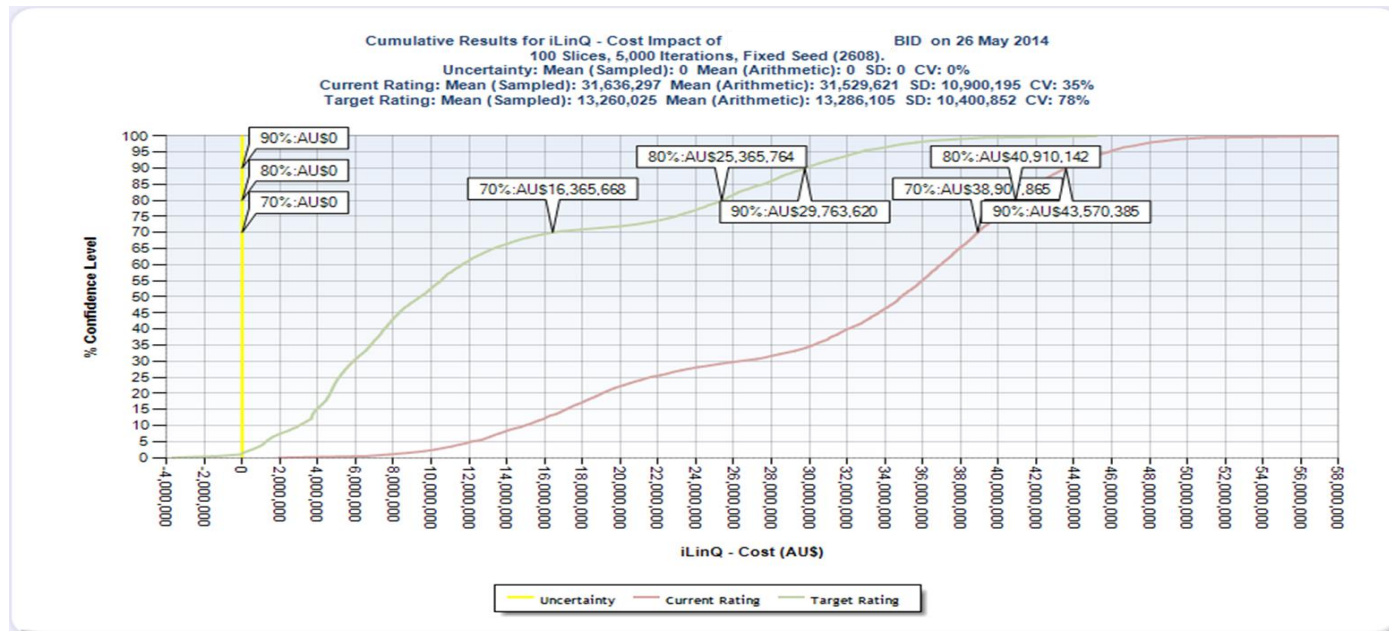


Assumptions

Monte Carlo Simulation



3 Point Estimates & Exposure



05 From Bid to Buck\$



PPP's , SPV and the Risk Transference

Governments have historically used risk transference to:

- Ensure control over the project
- Ensure additional financial support is available to the SPV.
- 'Cost Out' legacy risk.
- The tactic is early risk allocation





Risk Allocation & Large Projects

Figure 2: Risk Allocations between Key Participants

Risk	Reference	PPP Company	Rolling Stock Manufacture Contract	Through Life Support Contract	Maintenance Facility D&C Contract
Cost of the Project greater than estimated			•	•	•
TLS Payments less than estimated				•	
Time for Delivery Phase greater than estimated			•		•
Number of Sets insufficient to provide Required Availability				•	
Distance travelled greater or less than estimated			•	•	
Maintenance or patronage being greater or less than estimated			•	•	
Timetable changes including times for first or last services				•	
Track and interface conditions worse than estimated			•	•	
Liability for Taxes being greater than estimated		•	•	•	•
Land additional to the Maintenance Site/s needed			•	•	•
Site Conditions			•	•	•
Availability or quality of any materials for the Project			•	•	•
Technical obsolescence			•	•	•
Any law change affecting the Project Agreements		•	•	•	•
Industrial action or interference from third parties			•	•	•
Inclement weather			•	•	•
Variations		•	•	•	•
Compliance with the Specifications not satisfying Contract obligations			•	•	•
Delays, increased costs or decreased revenue			•	•	•
Delay in, or refusal of granting any Approval by an Authority		•	•	•	•
Any other act or omission of an Authority		•	•	•	•
Ability to obtain any Utility Service		•	•	•	•
Ability to obtain & maintain the Insurances		•	•	•	•
Adequacy of the Insurances		•	•	•	•
Any occupational health & safety matters		•	•	•	•
Availability and cost of finance		•	•	•	•

This is a fantastic way to make money

People don't like risk

They are happy to sell it

They aren't managing it right

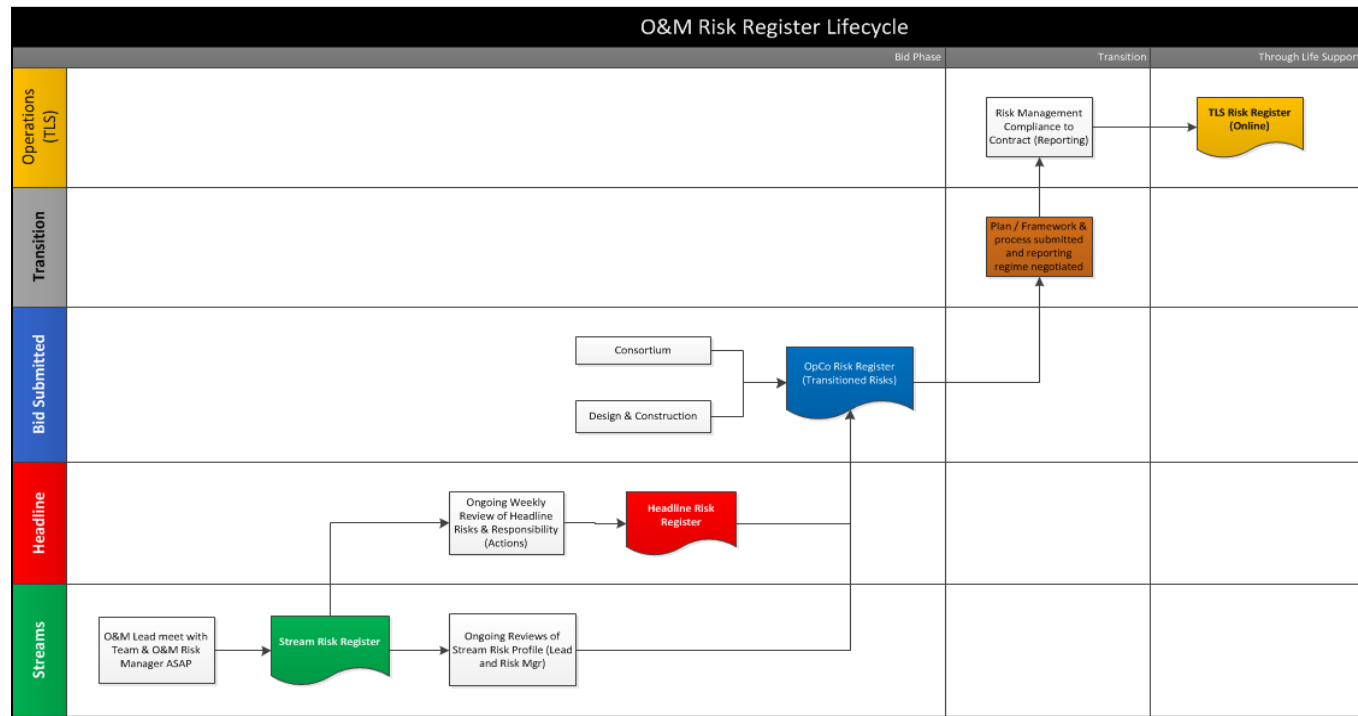
They are afraid of the dark

Register lifecycle from bid to buck\$

You won't be
around
forever

Decisions
you make
now will
cost/make
money

Lessons
Learned



Selling Risk



What if I could Provide certainty around whole of business activity by using a contemporary and consistent enterprise wide approach to business risk management allowing the board and executive to make sound business decisions with assurance – creating value, reducing cost and improving revenue?

Would I be the most important person in the room?



‘Sweat’ your Risk Manager

- If you have a **good one** keep them
- If you have a **great one** – make sure you keep them (see last dot point)
- Use them as a **process champion** to drive the function
- Bring them into the strategy to **strategic alignment**
- Ask them to embed a **risk culture – not just risk manage**
- Flog them as a **USP**
- Use them across **functional business units**
- Organisational design (*where are they and what does that mean?*)



Takeaways

- Approach is totally transportable
- Cross functionality (not just a risk register a sexy & cool certainty process)
- Applicable in WHS/Finance/Operations/Industry/Govt etc....
- Understand its origin to understand its direction
- Embedding is not a half pregnant proposition

As of 9.17am this morning are there any good Jobs out there in the Room?

- 552 Jobs over 200K (Senior)
 - 1327 Jobs of 150K (Middle)
 - 3588 Jobs over 100K (Junior 1-3 y)
 - 3386 Jobs up to 100K (1 Year)
-
- Don't undersell what can be achieved
 - Watch organisational design in the PD
 - Play the whole 31000 space
 - Create your own risk approach that influences – make them come to you



Questions