



Project Controls
E X P O

Project Controls Expo - 31st Oct 2012 **Twickenham Stadium, London**

Schedule Risk Analysis: An Overview
(Getting it right)



Project Controls
E X P O

Copyright @ 2011. All rights reserved



About the Speaker

Martin Gregory CEng MEng MIET MAPM

Head of Risk – Rhead Group

10 years Project Manager in DPA/DE&S (MOD)

5 years Principal Consultant (HVR Consulting/QinetiQ)

Specialisms

- ☐ Risk Management Improvement Programmes
- ☐ Quantitative Risk Analysis/Modelling
- ☐ Developing risk based solutions to support decision making

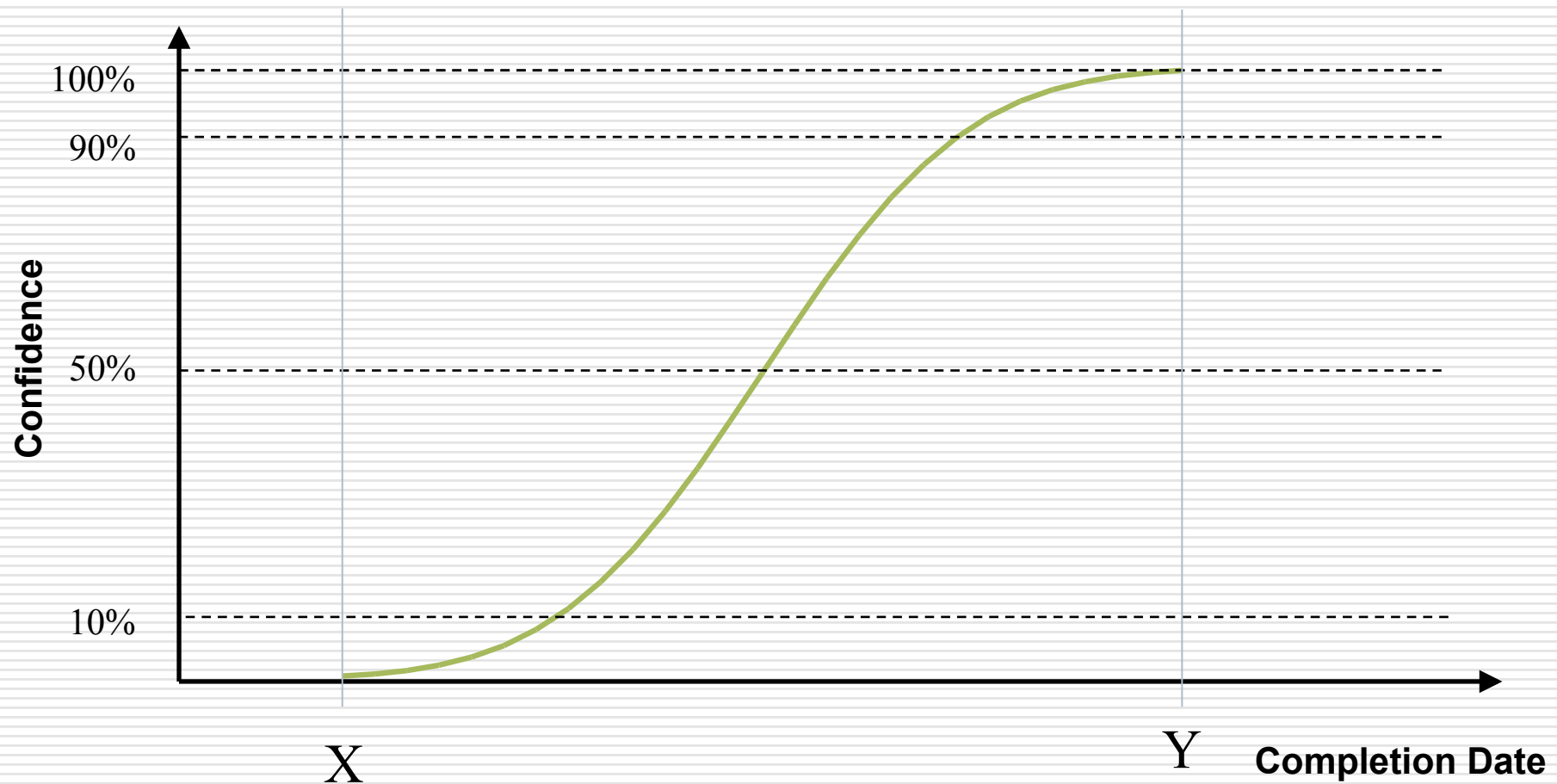
CONTENT

- ☐ Why bother with schedule risk analysis
 - Outputs that aid decision making
- ☐ SRA what is it?
- ☐ How to carry out SRA correctly
 - Step by Step
- ☐ Improving risk inputs
 - Risk descriptions
 - Risk estimates
- ☐ Bad Practice to avoid

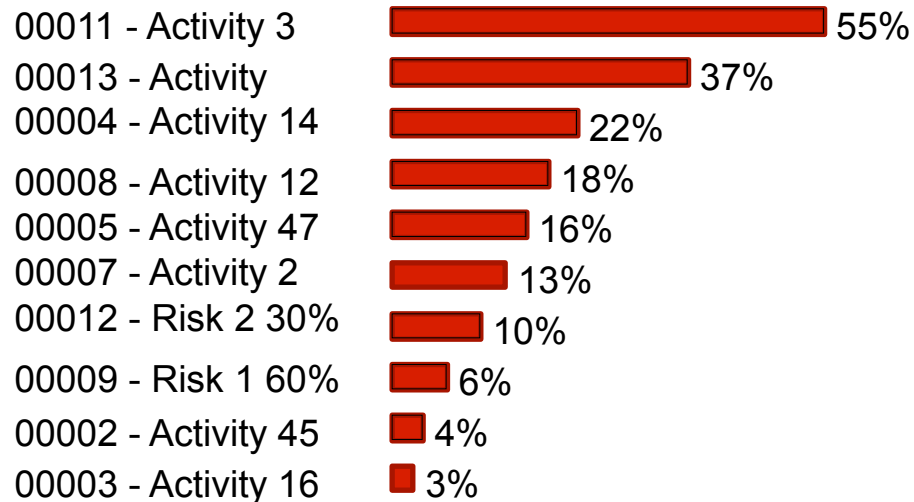
Schedule Risk Analysis

WHY BOTHER?

SRA Output 1 – Confidence Based Forecasting (Project/Task Duration)

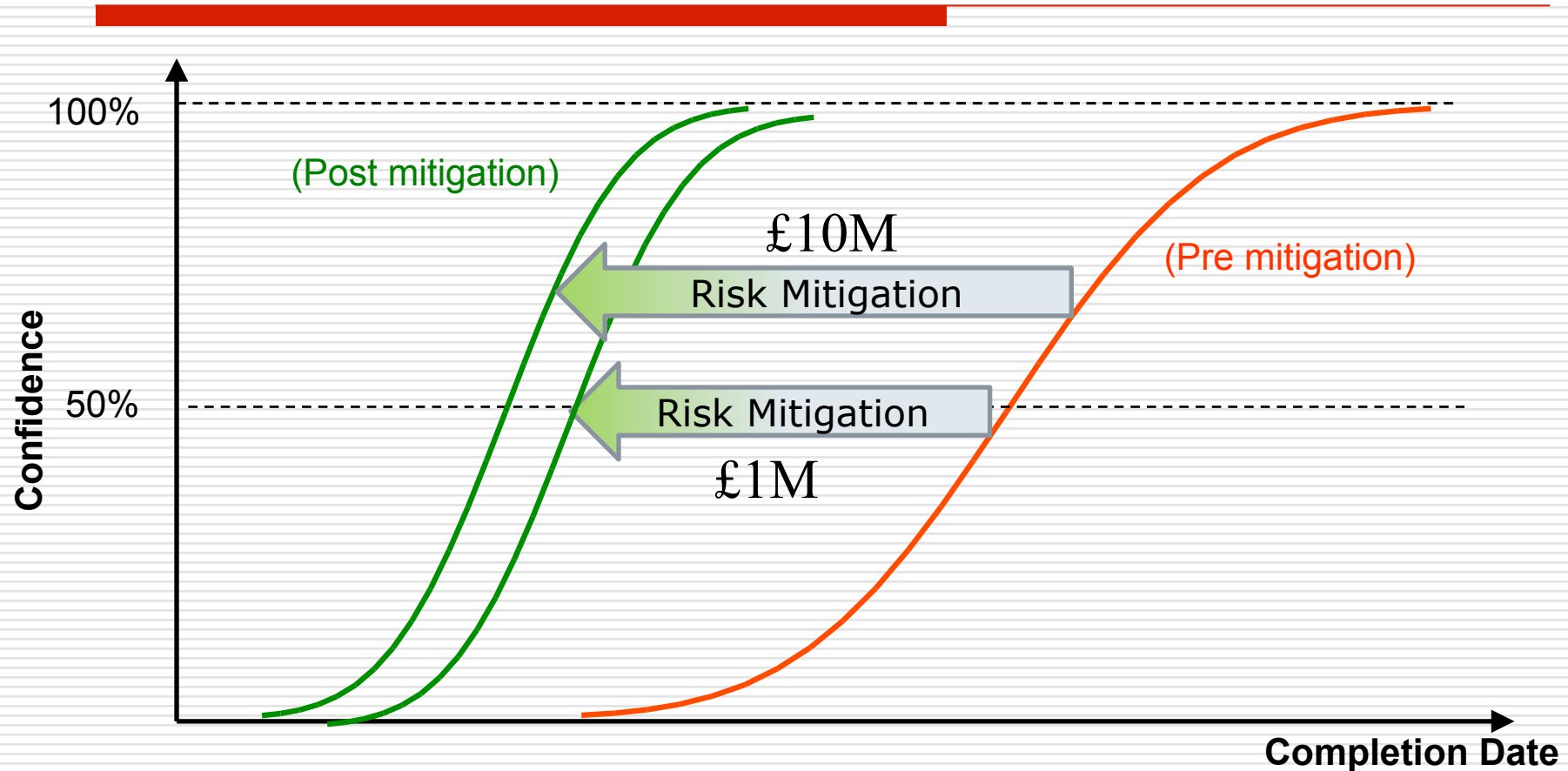


SRA Output 2 – Schedule Driver Analysis

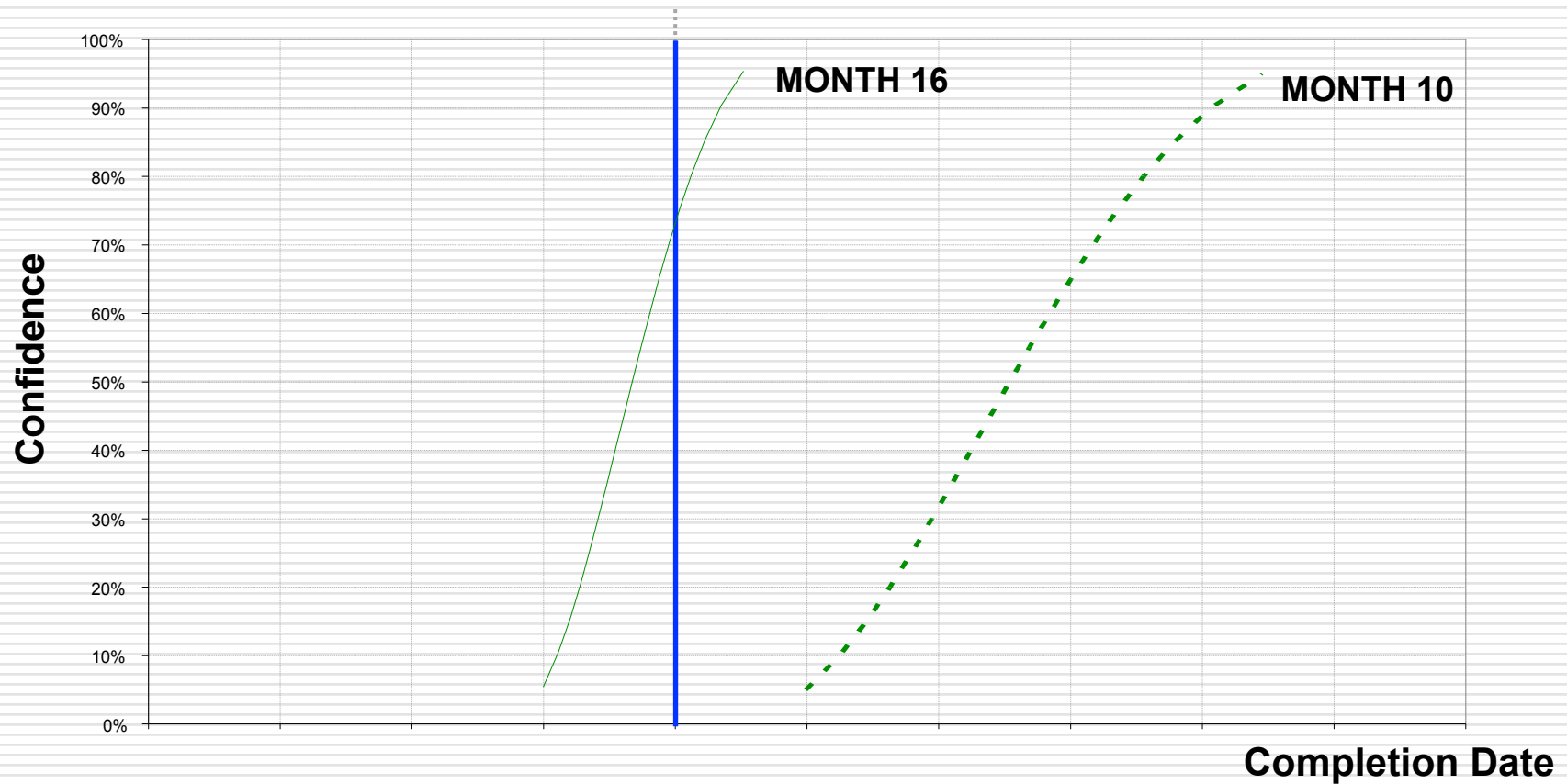


- Sensitivity
- Criticality

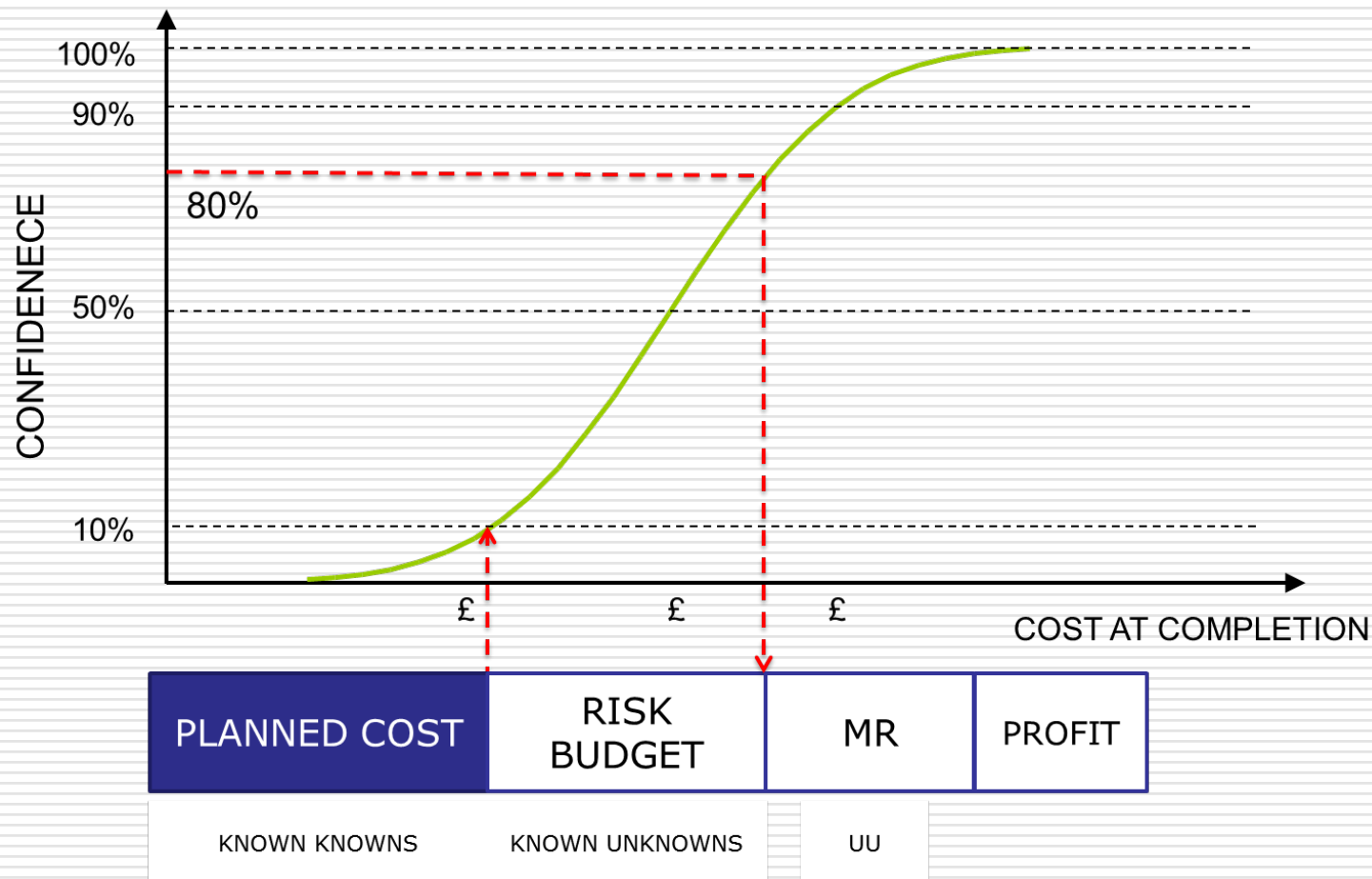
SRA Output 3 – Risk Mitigation Optimisation



SRA Output 4 – Trend Analysis



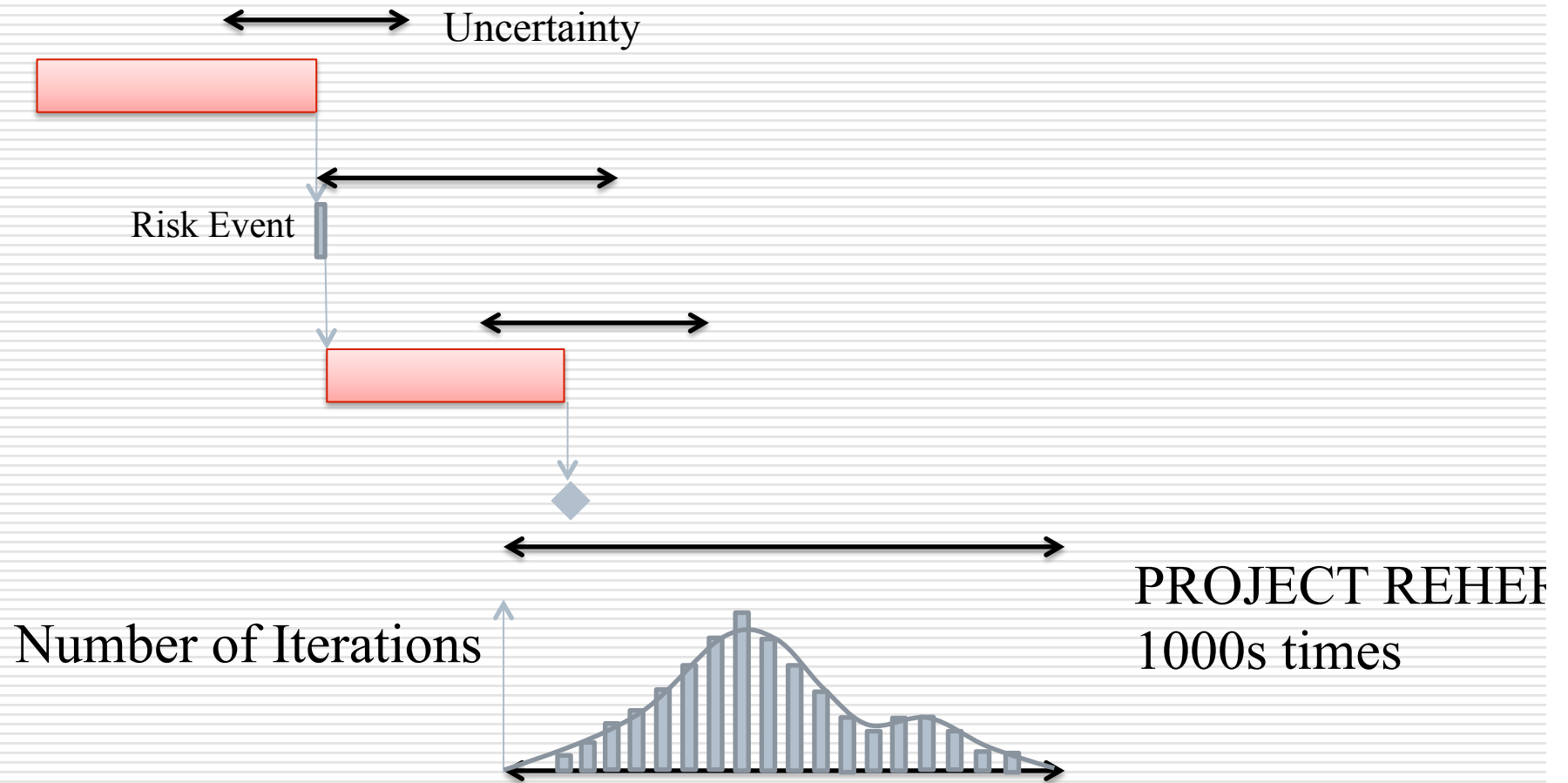
SRA Output 5 – Input to project risk budget calculations



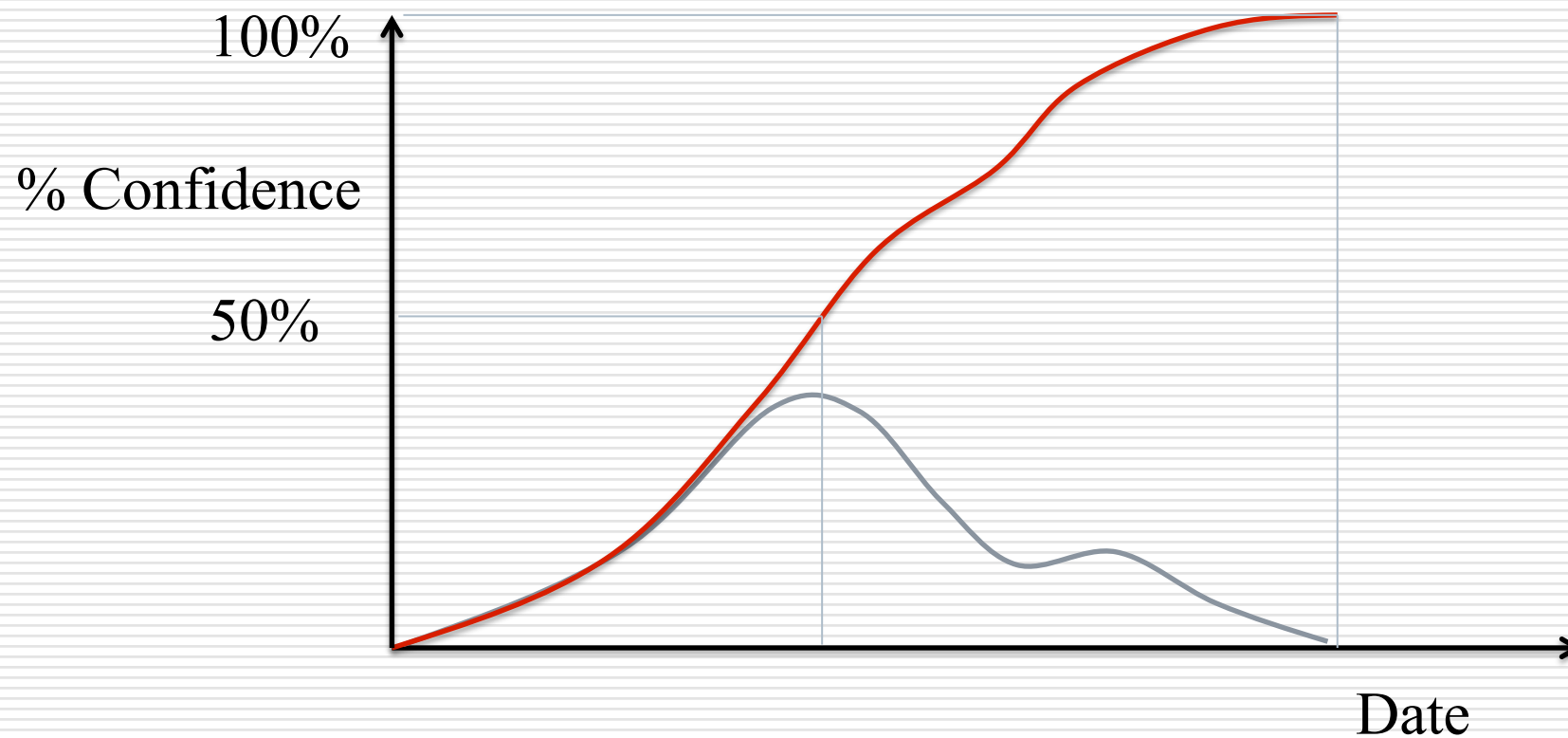
Schedule Risk Analysis

WHAT IS IT?

SRA using Monte Carlo Simulation



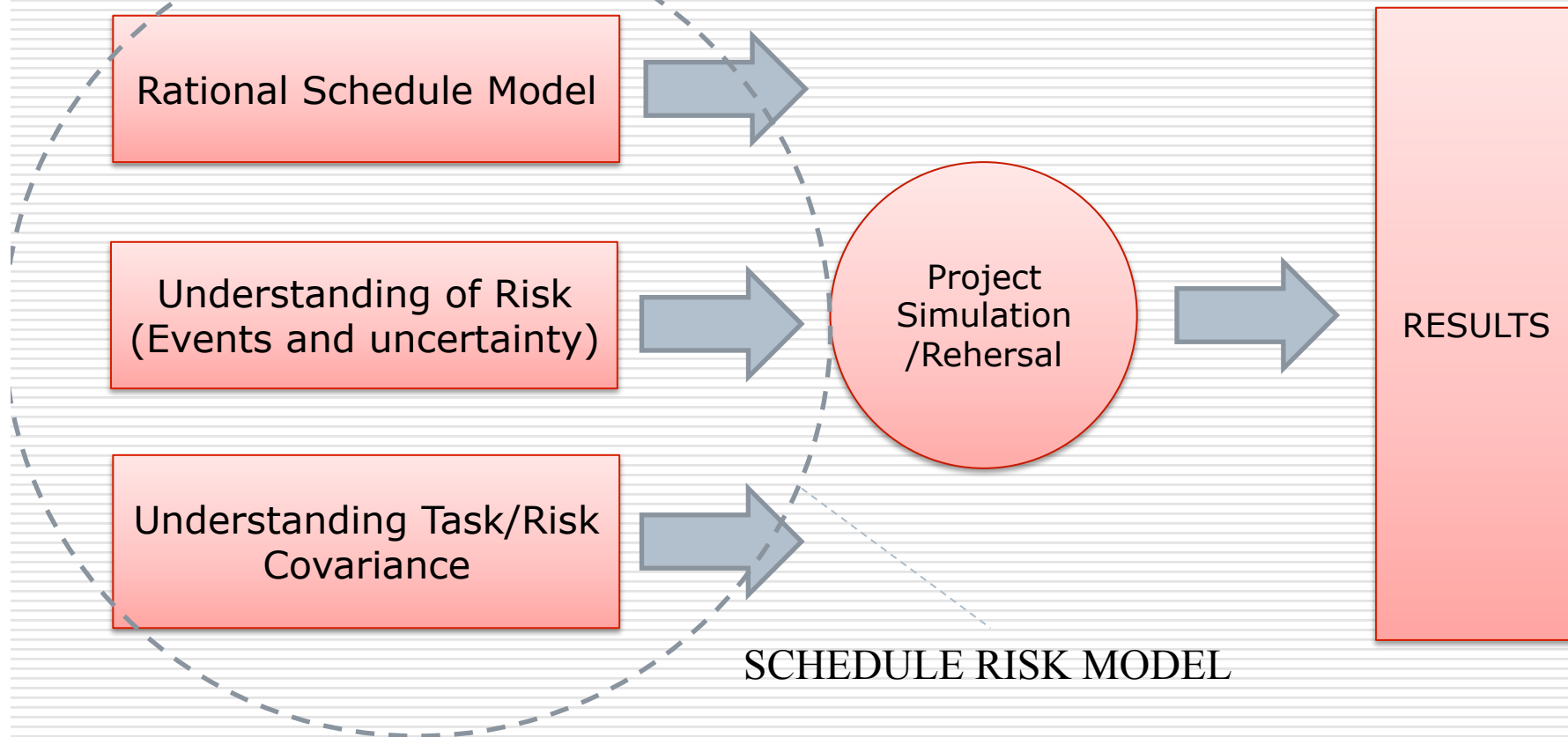
Probabilistic Forecast - S-Curve Output



Schedule Risk Analysis

HOW TO DO IT RIGHT

Get the model inputs right

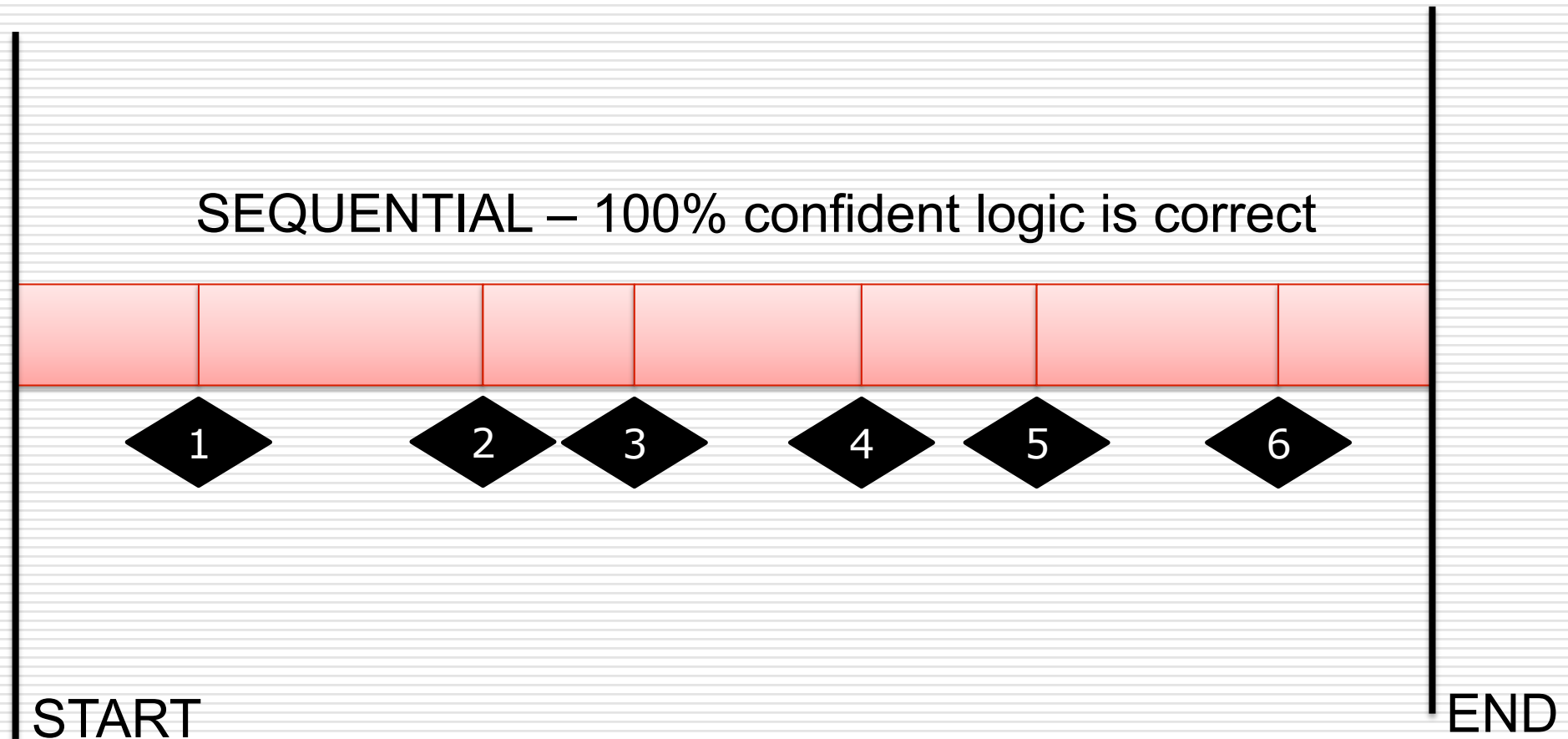


CHECK THAT THE MODEL IS RATIONAL – IS IT WORKING AS IT SHOULD?

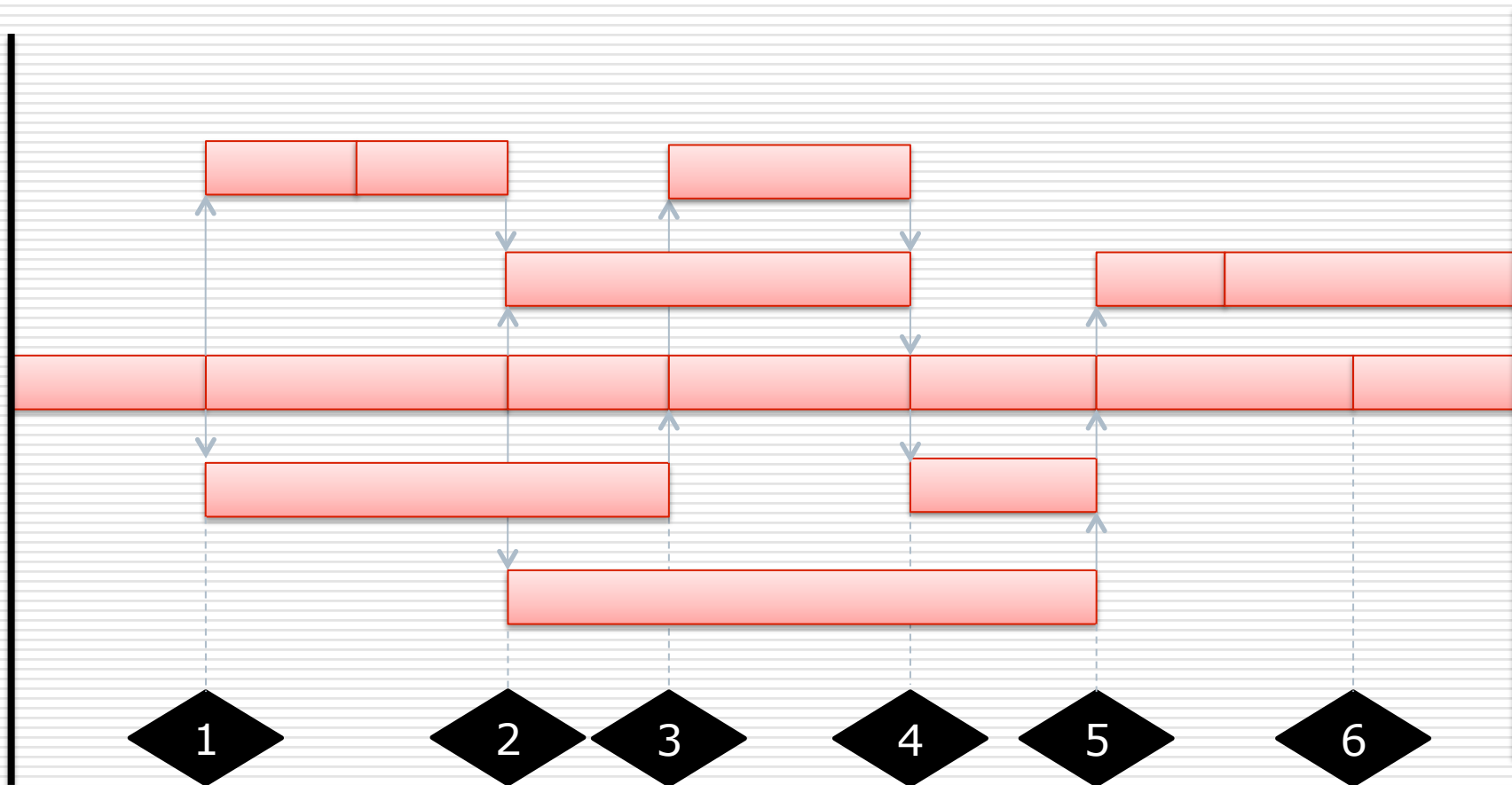
Golden Rules of High Quality SRA

- ☐ Do not start by assuming the project's detailed schedule is the right schedule model to use.
- ☐ Develop a Top Down schedule model with <200 lines. Too many lines dilutes the quality of estimation, can lead to very narrow results and confidence in dependency understanding/accuracy drops with schedule size.
- ☐ Develop a good understanding of how risk (uncertainty and events that threaten success) could affect the project and how it should be modelled.
- ☐ Ensure that 3 point estimates are not derived by merely adding +X% to a deterministic estimate. Give thought to the sources of uncertainty that could affect your estimate and how multiplicative effects can combine.
- ☐ Don't forget the risk register
- ☐ Check that the model is working correctly before committing to results

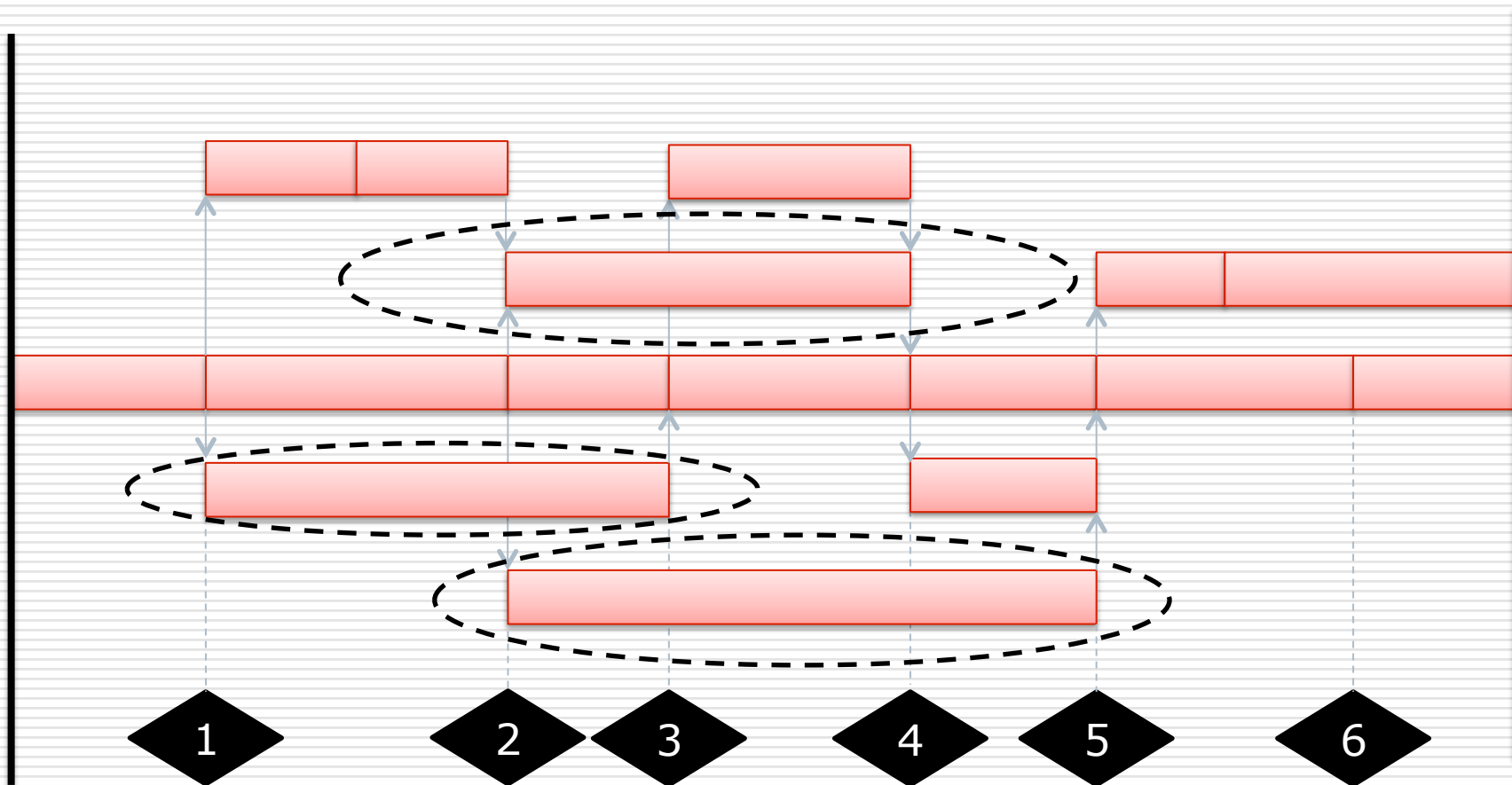
Step 1 – Identify Major Milestones between now and project end



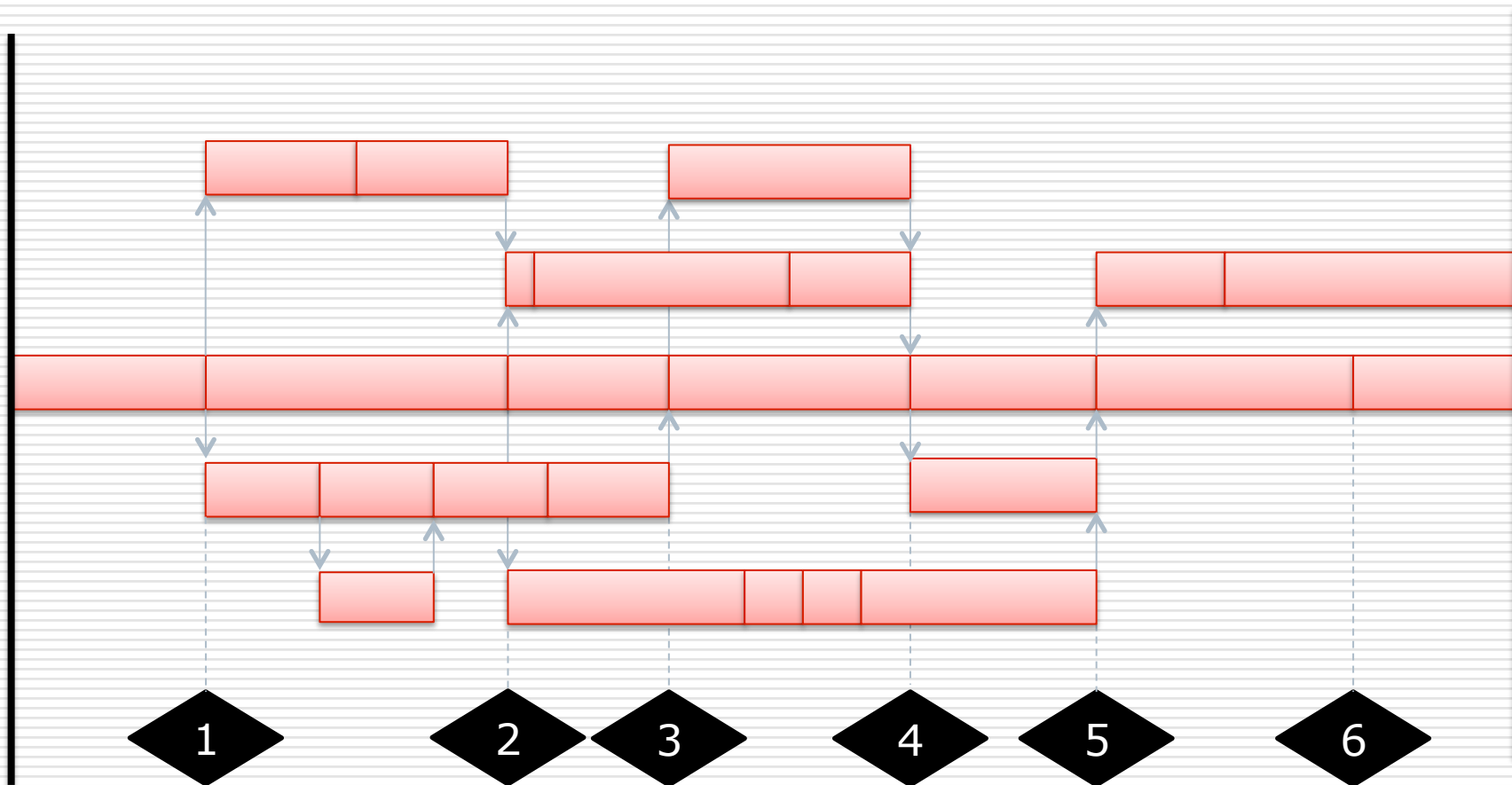
Step 2- Capture a first pass model of the schedule



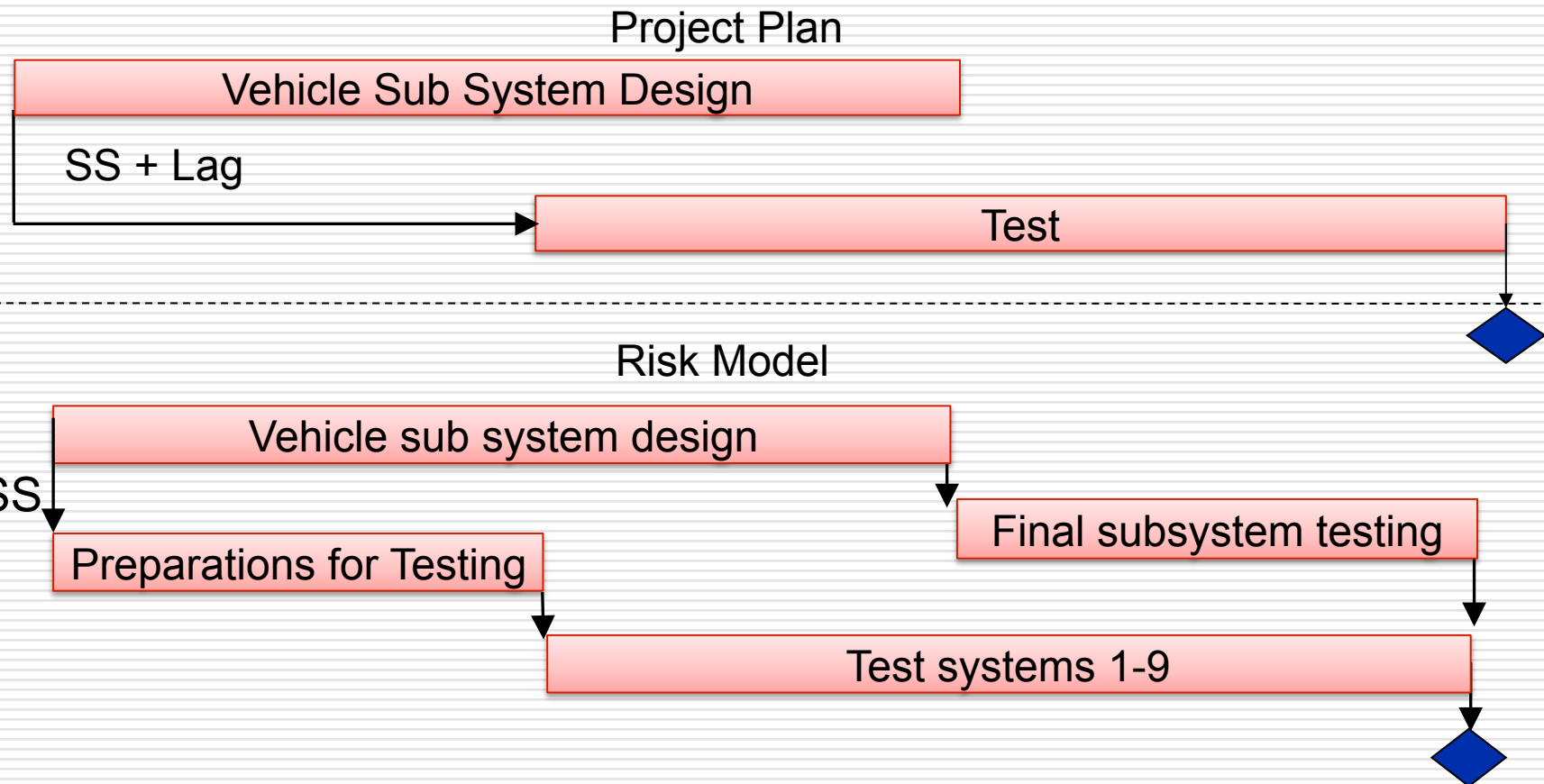
Step 3 – Add detail where appropriate



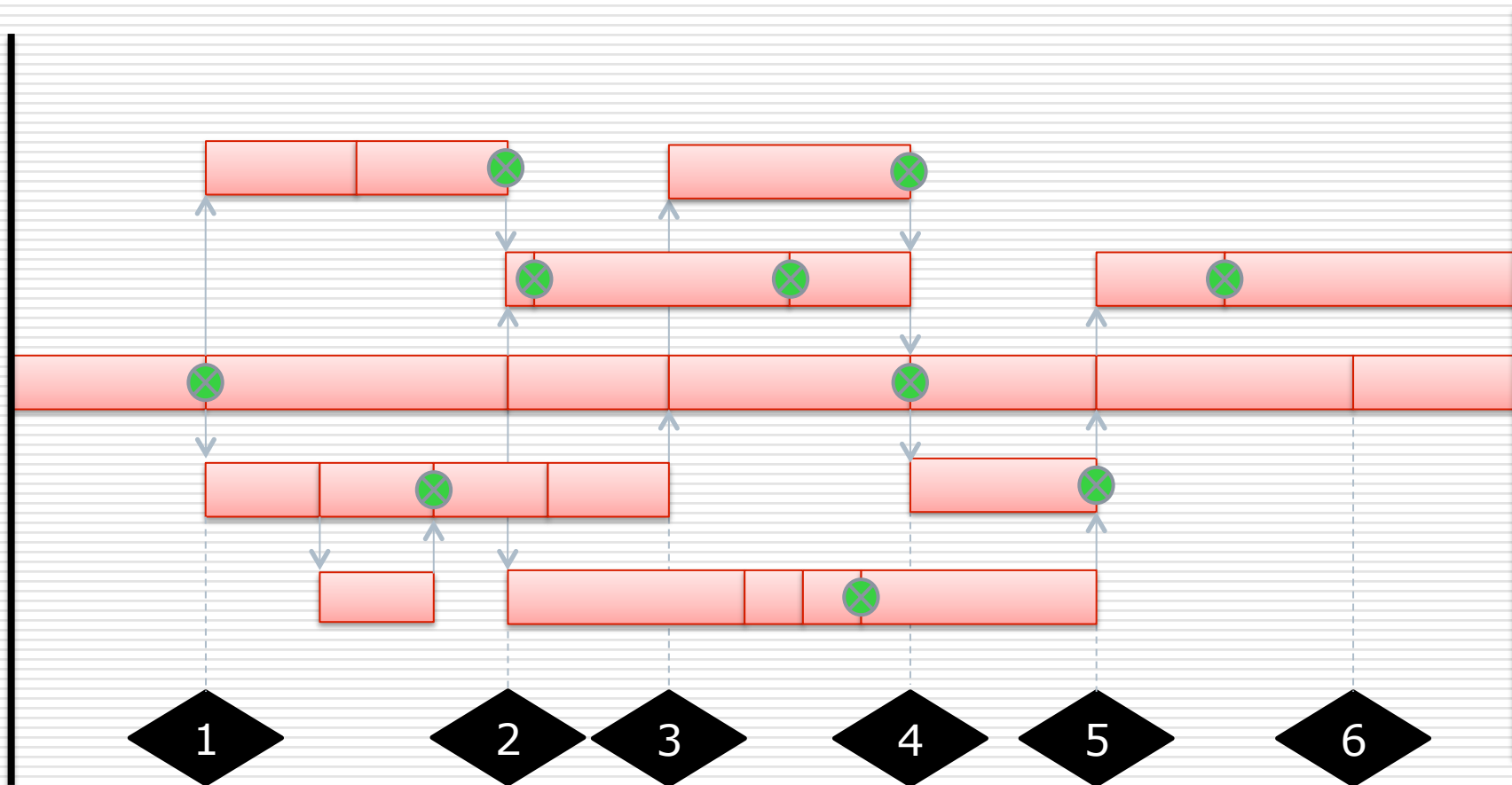
Step 4 – Check Logic and adjust if required



Inappropriate Logic for risk modelling

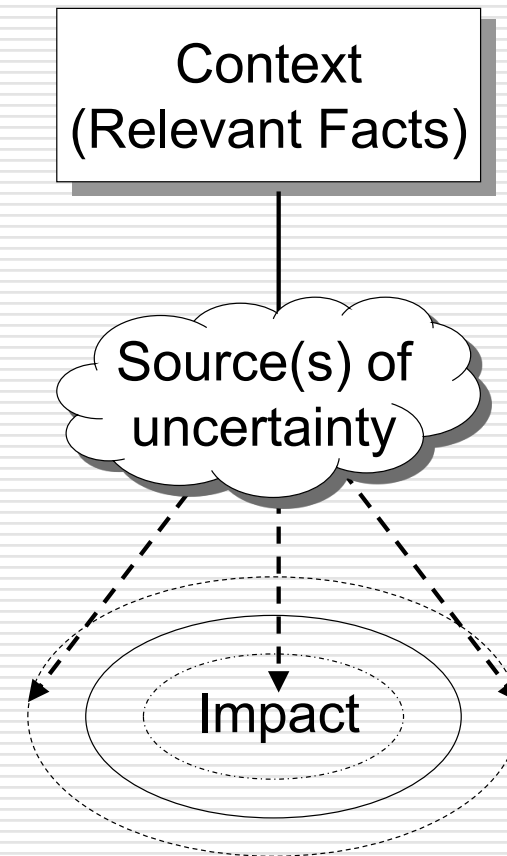


Step 5 – Add risks to the schedule model from the risk register

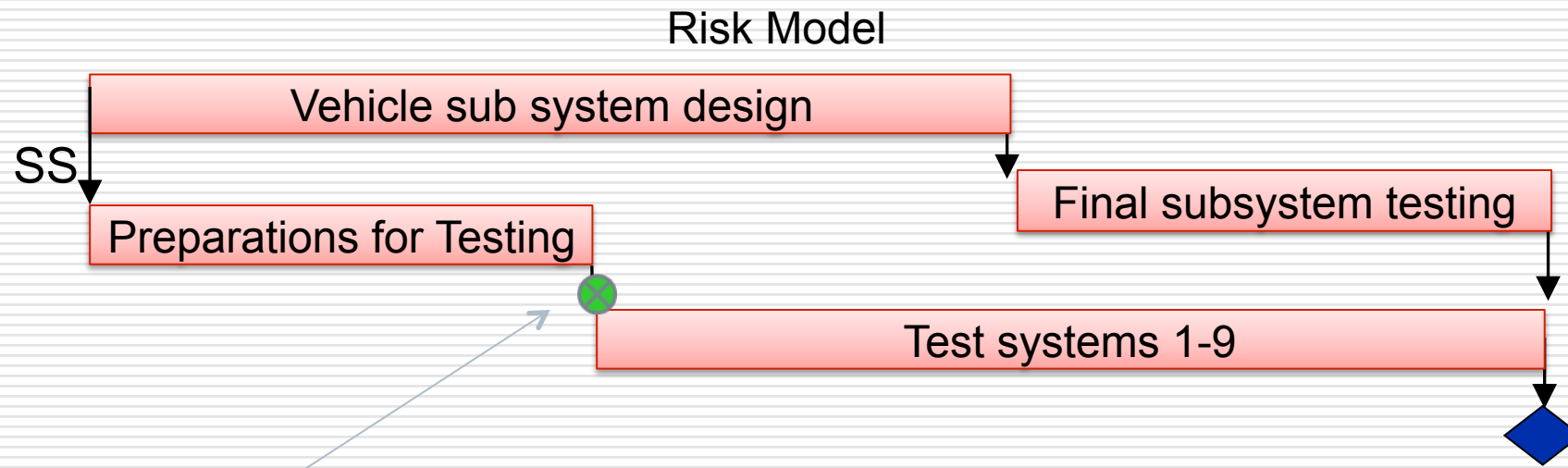


Improve risk event inputs

- ❑ Use 3 parts to your risk event descriptions
 - Context
 - Sources of uncertainty
 - Effects
- ❑ Risk estimates
 - Worst Case First
 - Consider how sources of uncertainty may combine
 - Best Case next
 - Most Likely last

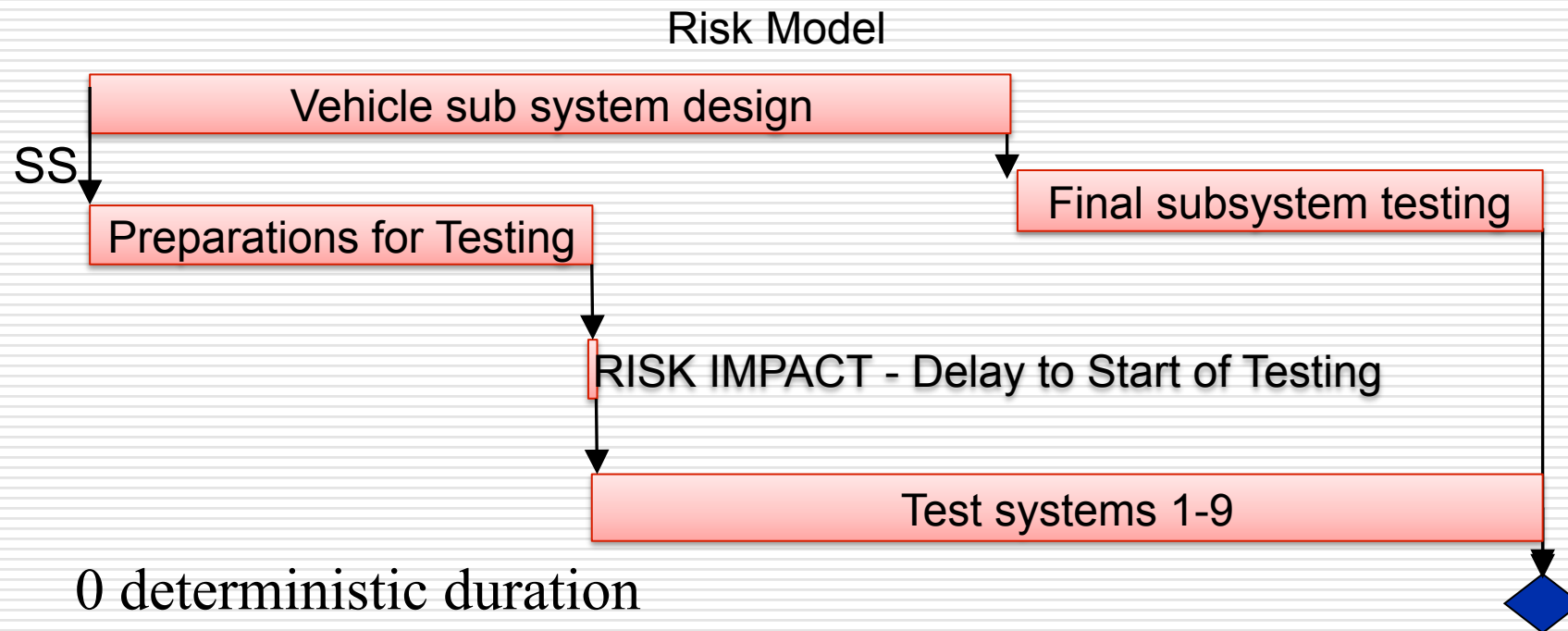


Adding Risk Events



RISK EVENT - We have chosen to use a test house that we have not used before. Their ability to be ready on time could be hindered by the availability of chamber time. This could lead to a delay to start of testing.

Adding Risk Events

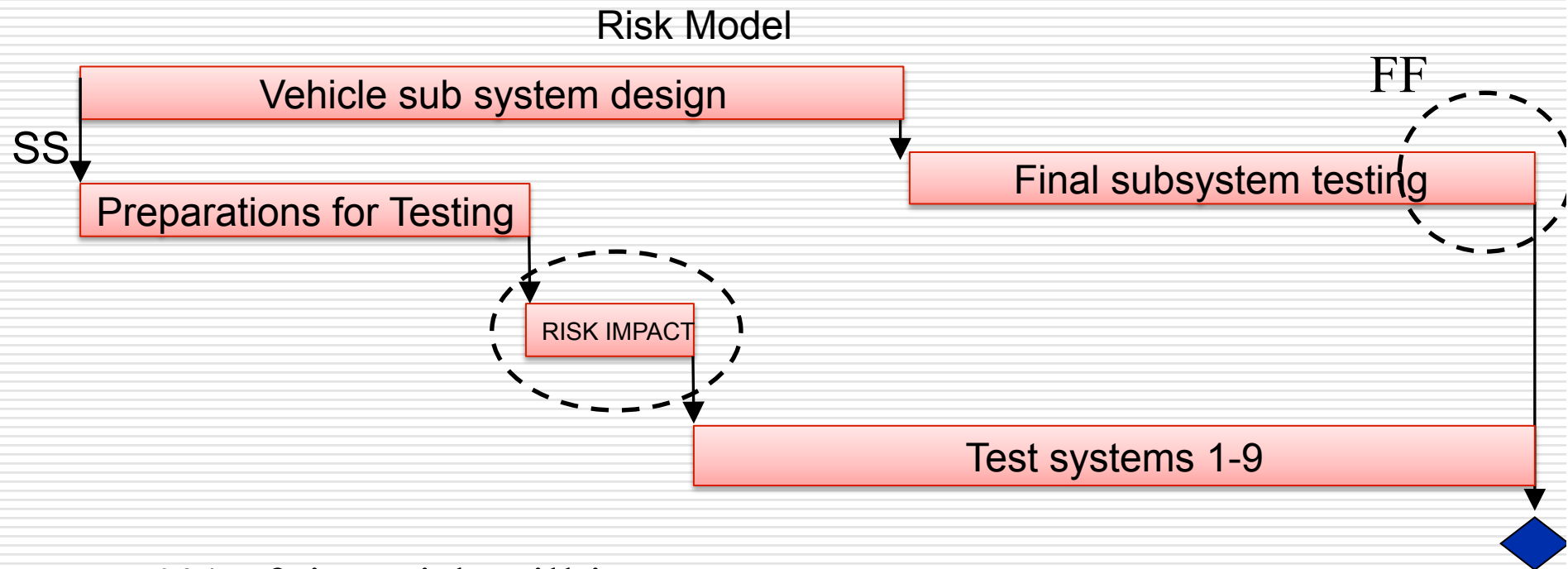


0 deterministic duration

Probability of 50%

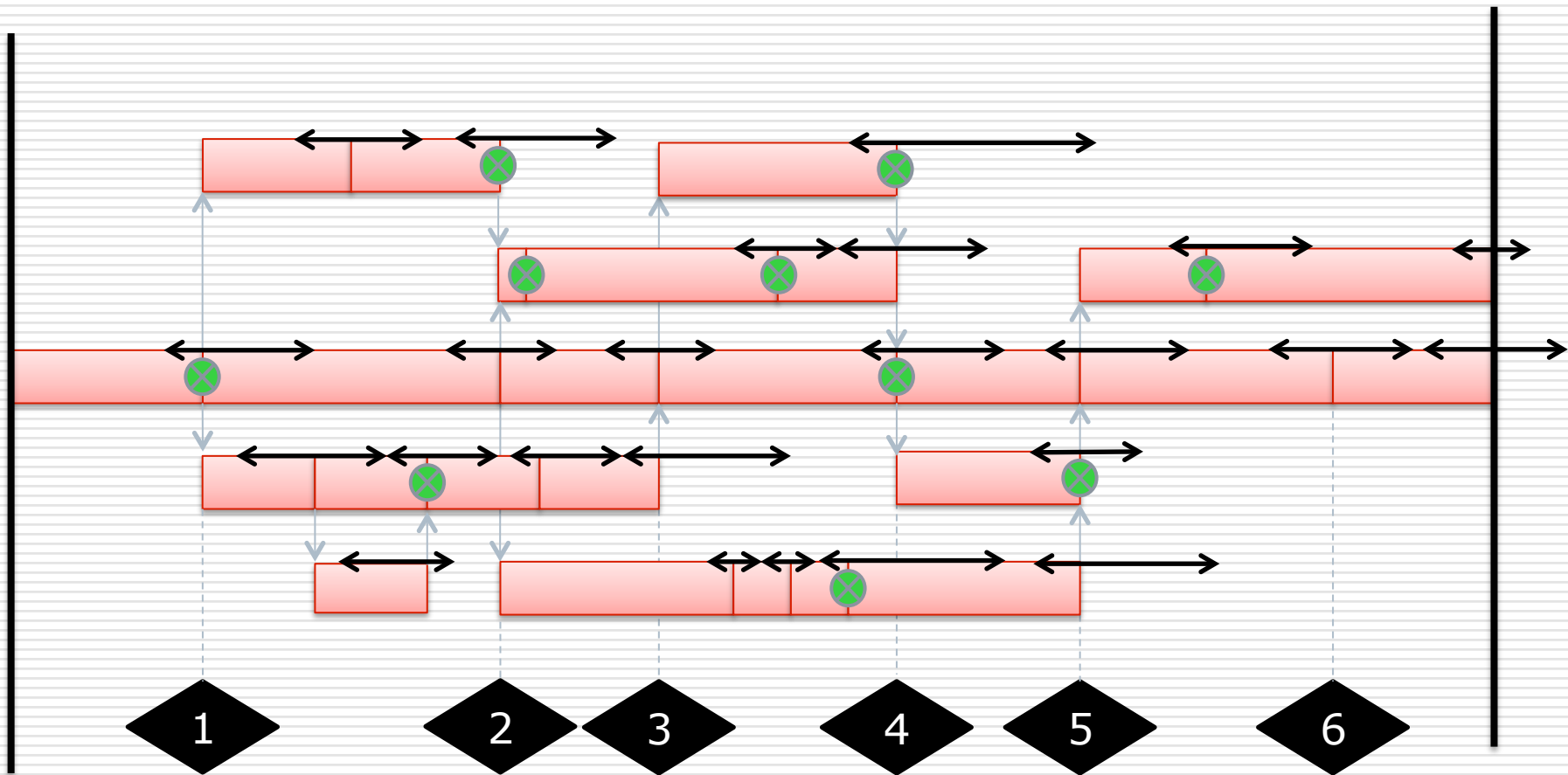
Impact – BC=1day ML=10 days WC = 60 days

Adding Risk Events

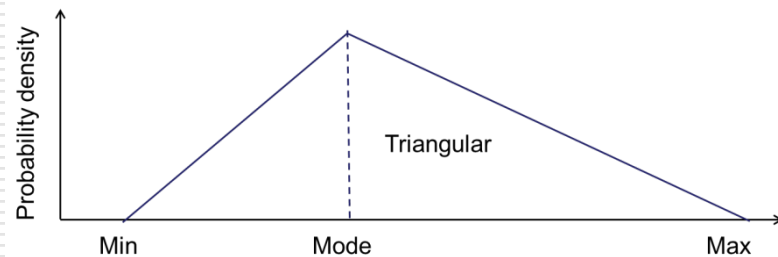


50% of time risk will impact to some extent

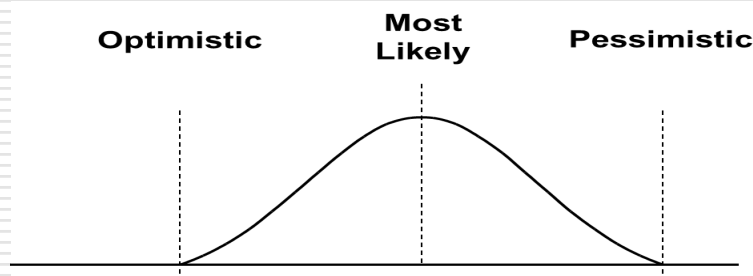
Step 6 – Determine and assign 3 point estimates for task duration



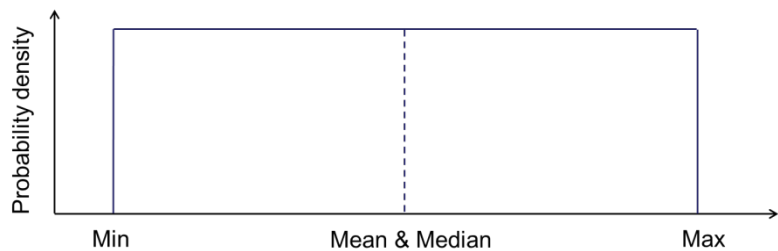
Example 3 Point Estimate Distributions



SKEWED TRIANGULAR



BETA PERT



UNIFORM

Step 7 – Check for duplication and assign covariance to tasks and risk impacts

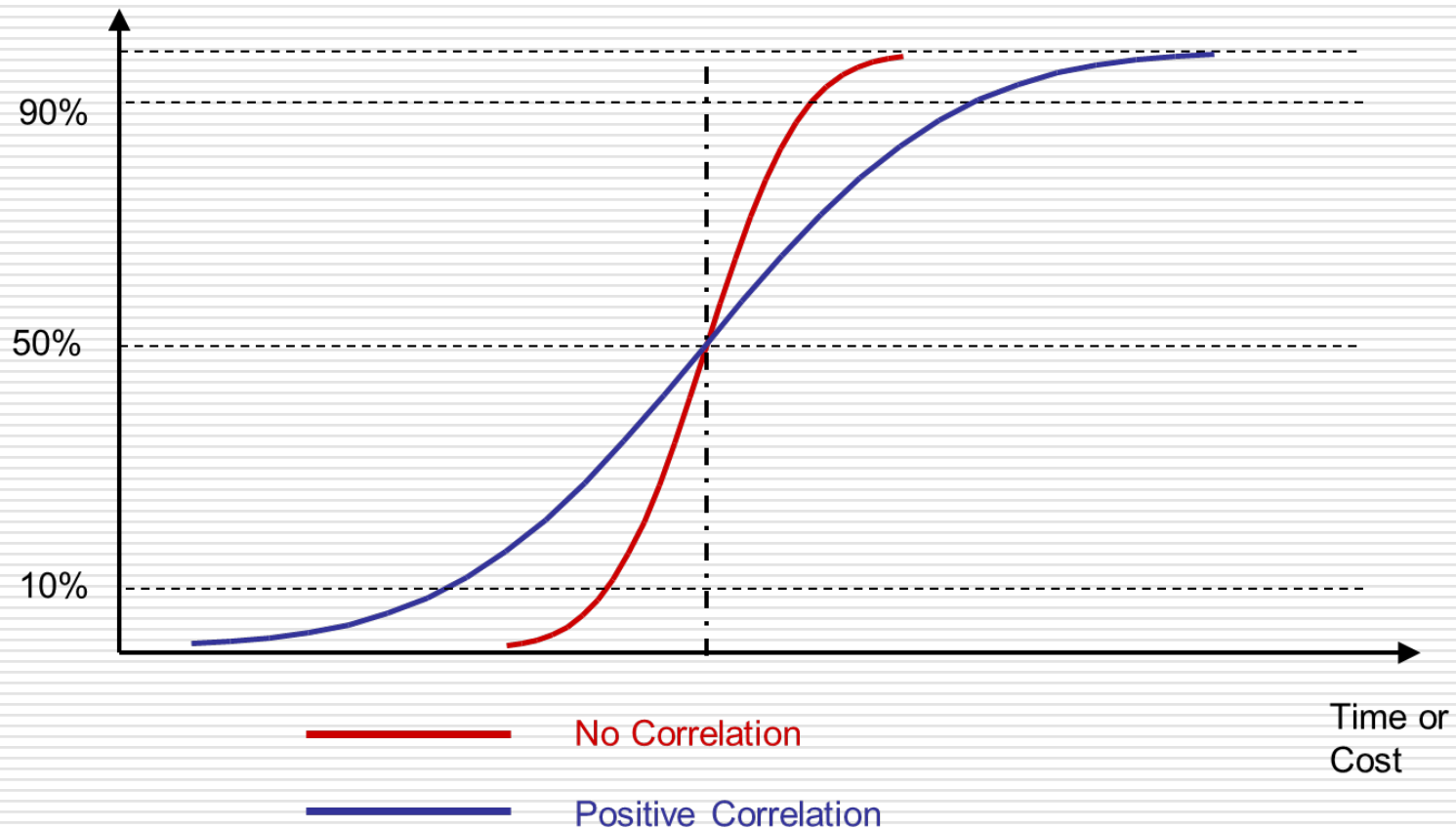
Covariance is a measure of how much two random variables change together (Task A and Task B)

Capture Covariance in the schedule model using correlation coefficients often included in modelling tools

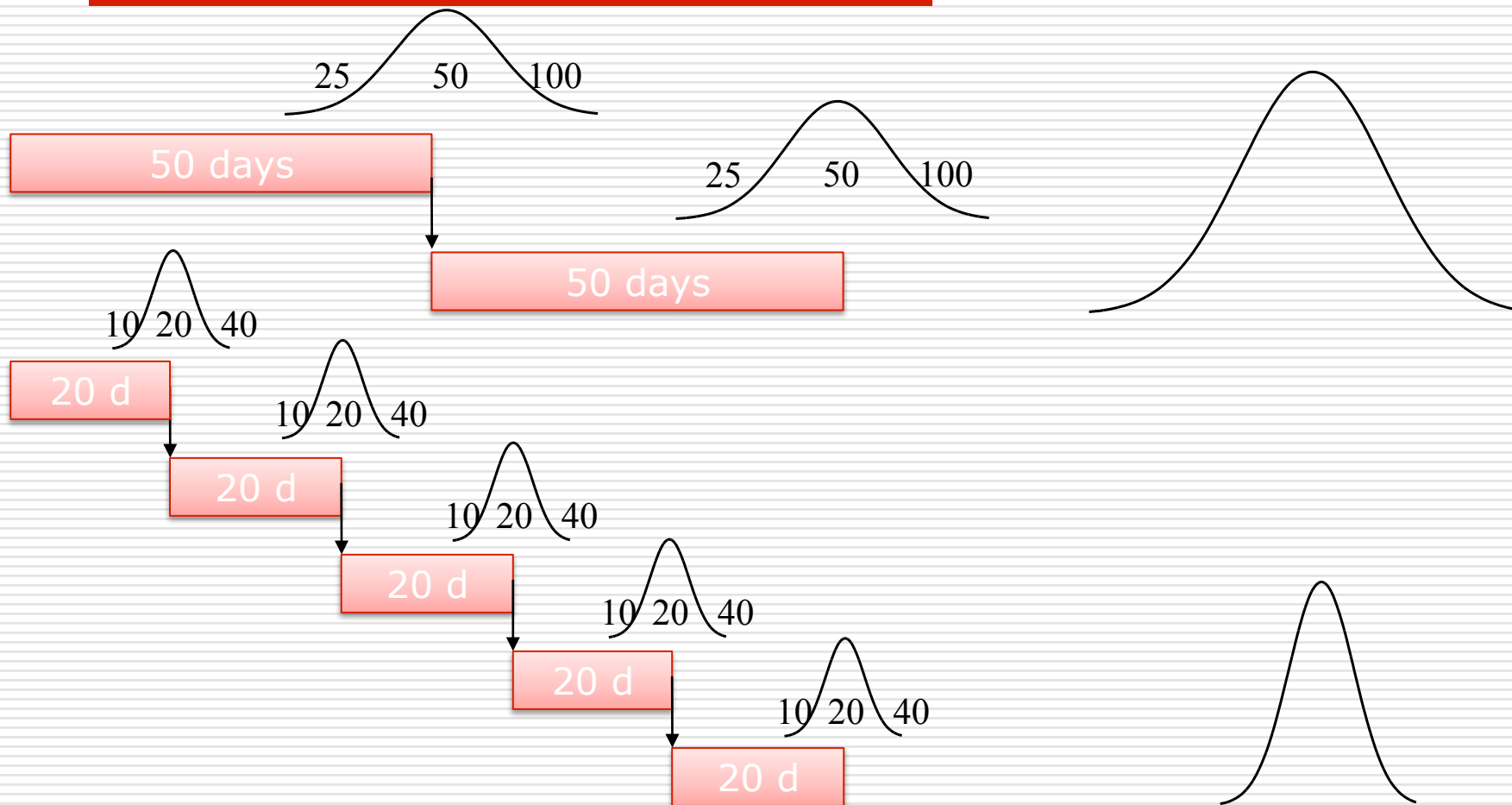
- Correlation of 1 = Directly proportional. As task A duration goes up by 1day, Task B's duration goes up by 1 day also
- Correlation of 0.8 = Strong correlation between components
- Correlation of 0.6 = Some correlation between components

One of the most important stages in SRA and is often missed out.

Effects of Correlation



Effects of too many tasks and not assigning correlation



Schedule Risk Analysys

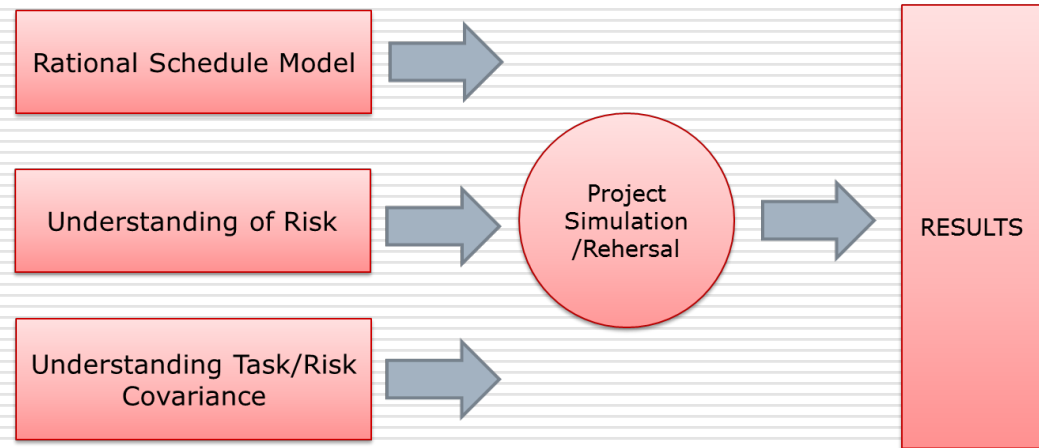
BAD PRACTICE

SRA Bad Practice

- ☐ Master schedule import
 - Do not immediately import your master schedule without considering whether it is appropriate to do so
- ☐ Over simplifying what takes time to get right
 - Do not immediately use +x% and -y% approach to assigning uncertainty around your deterministic estimate
 - Do not assume you have to assign every risk in your risk register
- ☐ I've bought the tool, done some tutorials, I am now an expert
- ☐ Do not present the results in a form that no one can understand just because to you it looks nice.
- ☐ Take care that risk is not duplicated
 - Uncertainty v Risk Events and schedule impact v cost impacts
- ☐ Task and risk event correlation is key!!!

Closing Remarks

- ☐ Rubbish in, Rubbish out
- ☐ Rubbish in, Gospel out
- ☐ Get the Model right



- ☐ Include task correlation as a must
- ☐ Takes time to get it right, there are no quick fixes
- ☐ Don't assume because you have a tool the model or output is right.

Schedule Risk Analysis: An Overview (Getting it right)

QUESTIONS?

