Schedule Risk Analysis for Insurance

How SRA can benefit the insured, the insurer and broker alike

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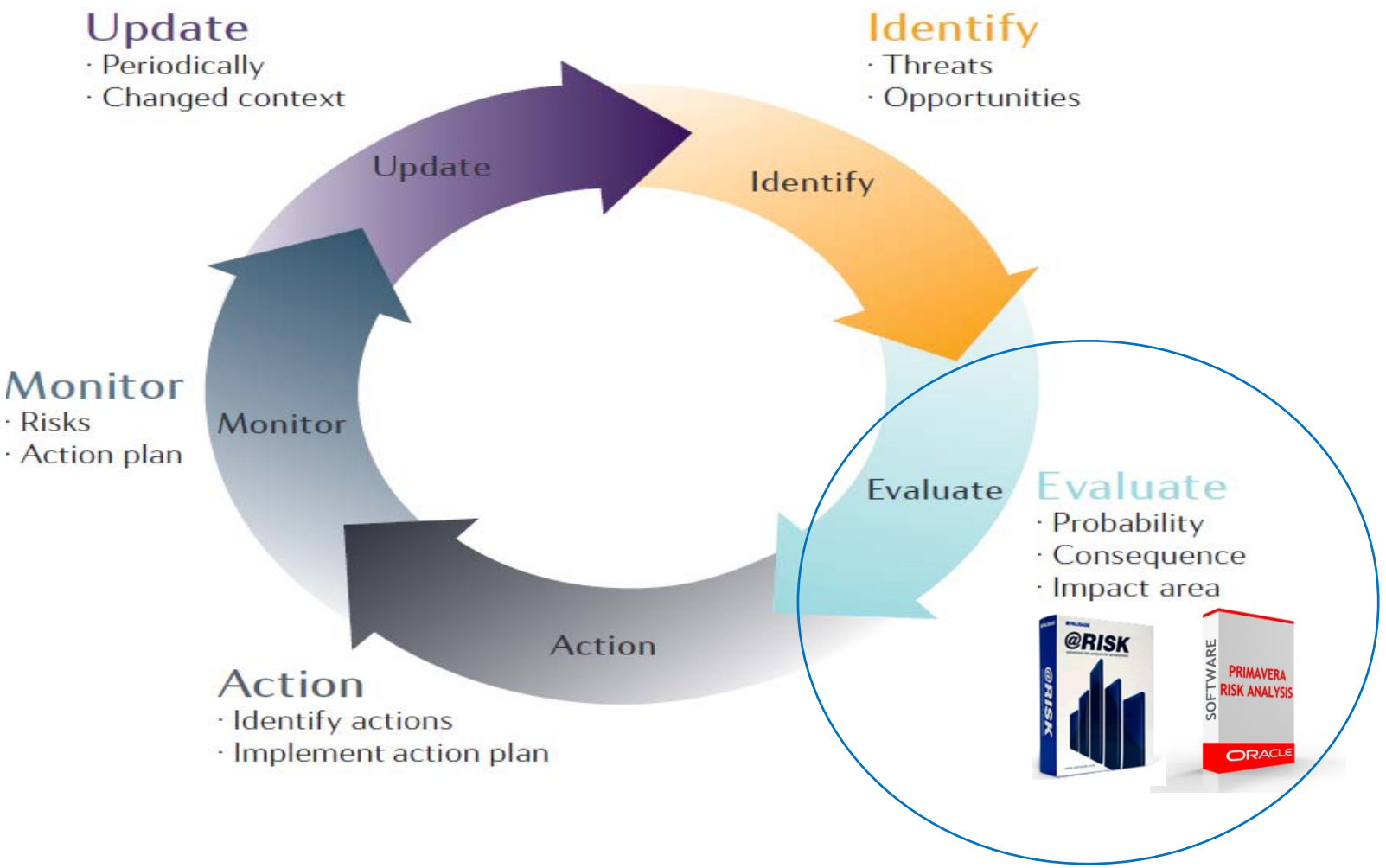
Content Overview

- Schedule Risk Analysis
- Monte Carlo
- Benefits

Quantitative Analysis



Schedule Risk Analysis

What is it?

Schedule Risk Analysis

- 2 ingredients
  - Schedule/Plan
  - Uncertainty & Quantified Risks

- Monte-Carlo Simulation of 000's of different forecasted outcomes
- Aggregation of results provides an S-Curve from which we can draw information from to improve decision making.
  - P10-50-P90

Project Schedule

- A Project Schedule is a dynamic representation of the project activities and their execution sequence.
- Dynamic Model – Not a Calendar
- Dates should be OUTPUTS not inputs

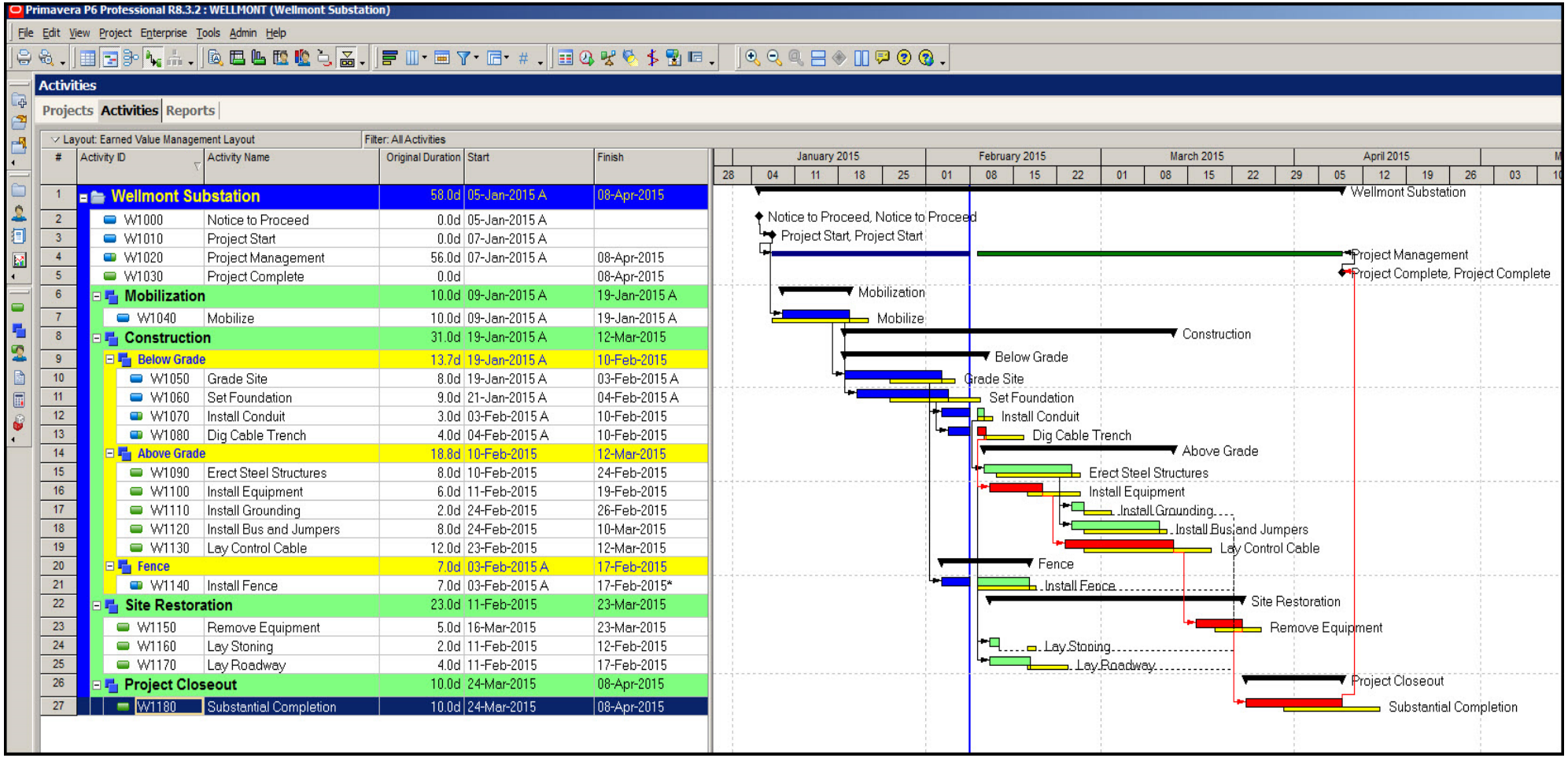
Schedule / Plan

WBS

Logic

Activities

Durations

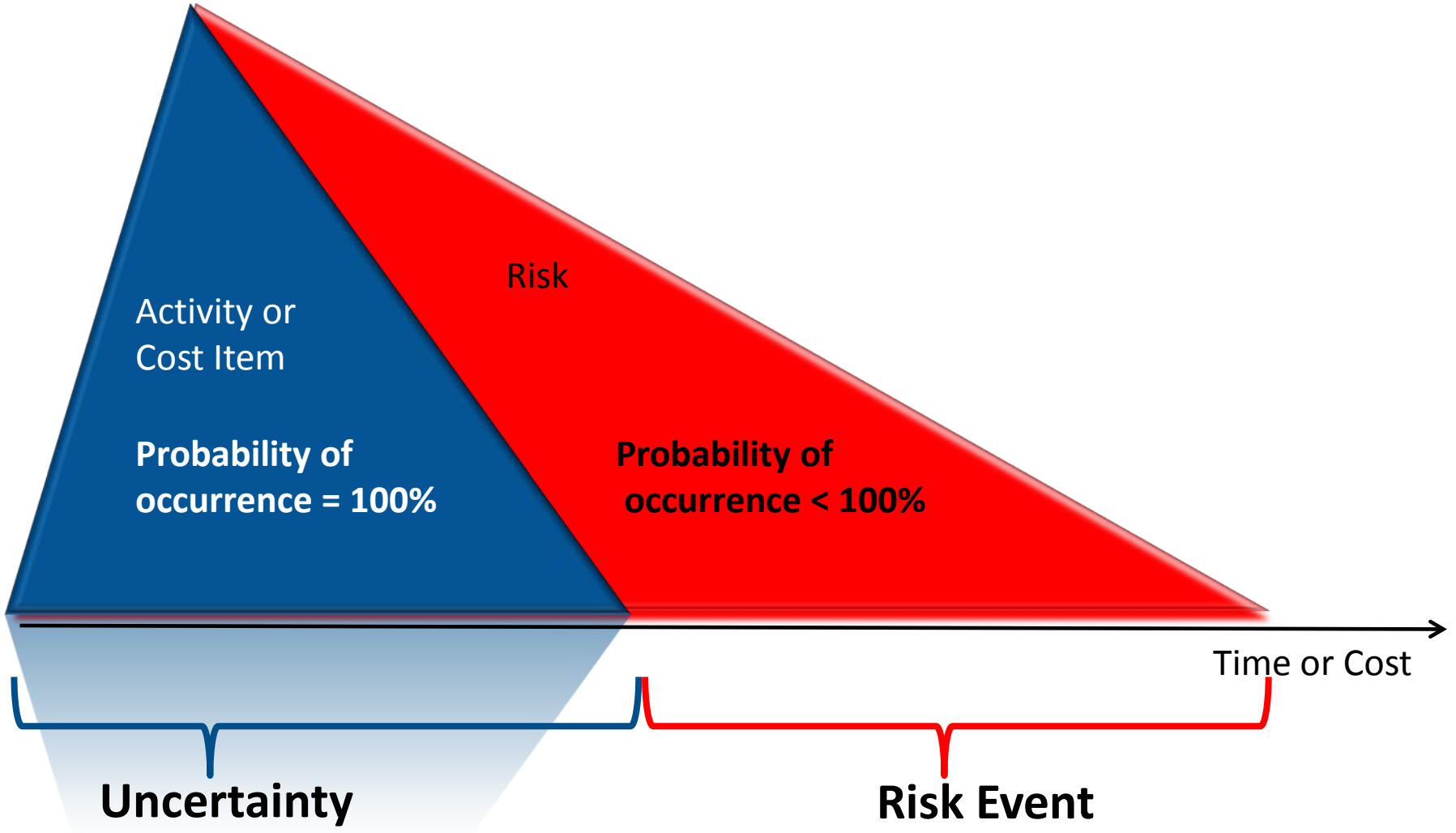


Why do we schedule a project?

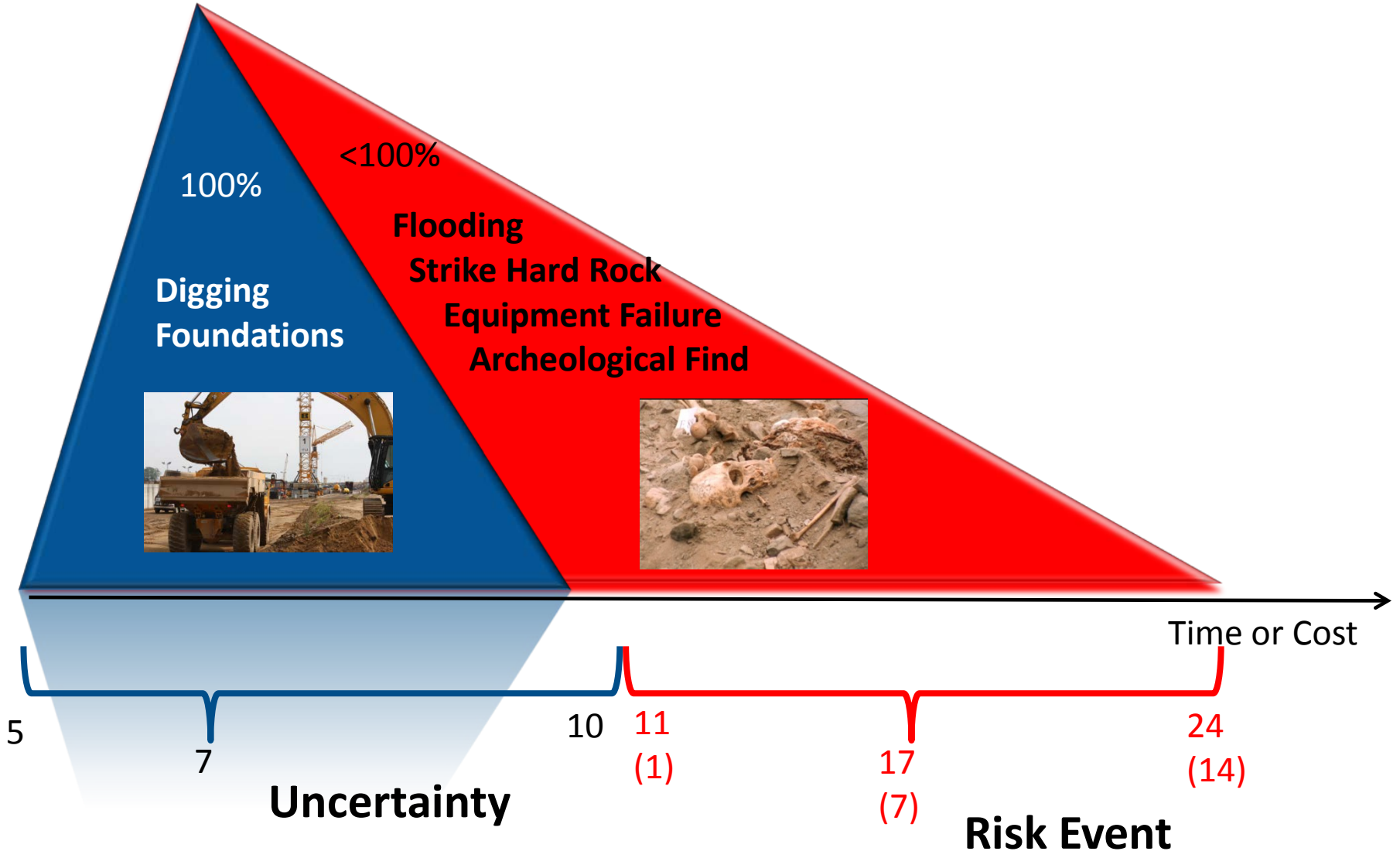
Risk & Uncertainty

Quanitification

Risk & Uncertainty



Risk & Uncertainty



Estimating Impacts

H&S? Reputation? Quality? Environment?

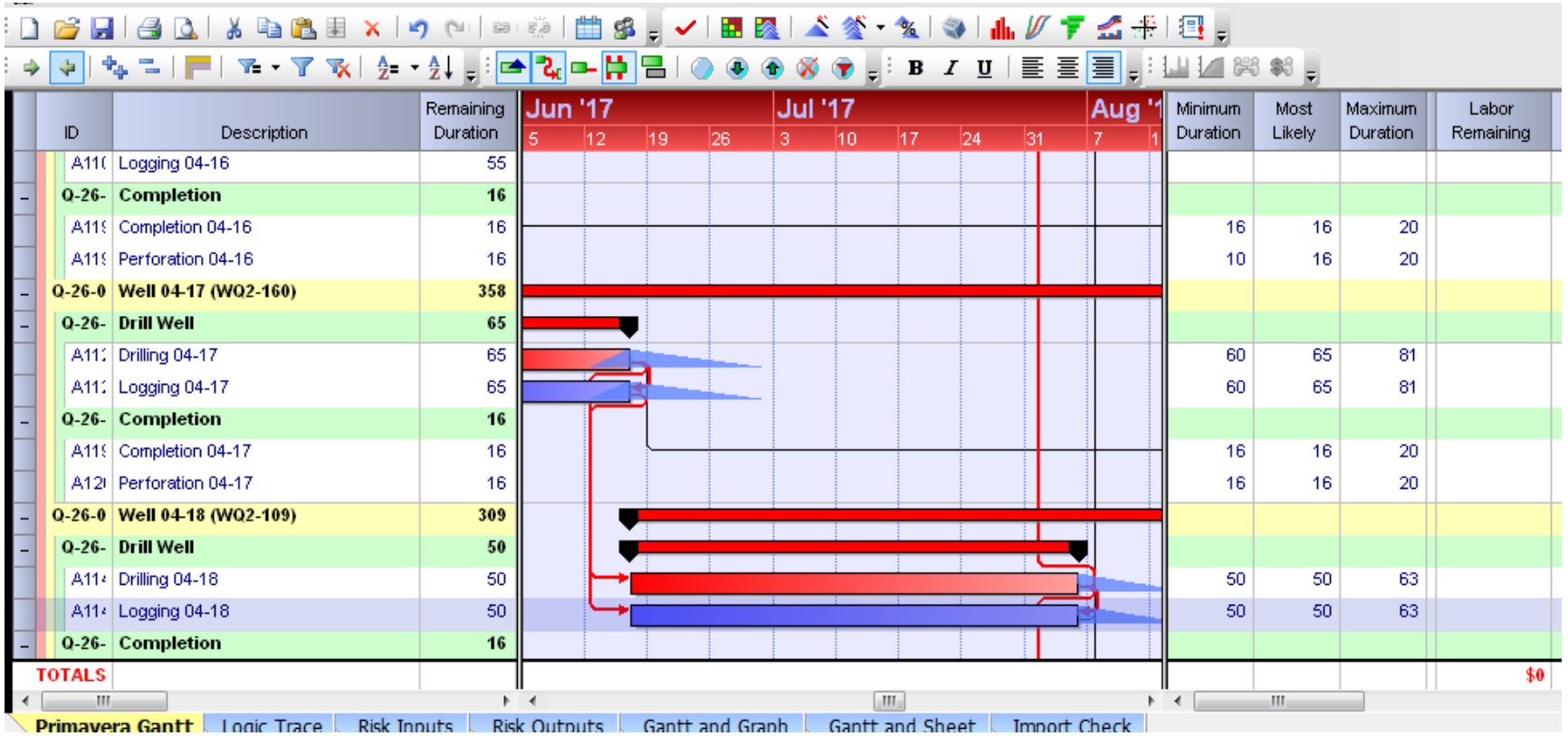
Durations Estimate Uncertainty

- Estimate stance decided
  - Optimistic, Pessimistic or Neutral?
- Apply + and – ranges
  - Run Analysis

WBS	Op/Pes/Neutral?	Min	Estimate (ML)	Max
Design Durations	Optimistic	-10%	30 weeks	+20%
Engineering Durations	Pessimistic	-20%	24 weeks	+5%
Excavation Durations	Neutral	-20%	6 weeks	+20%
Piling	Optimistic	-5%	4 weeks	+20%
Fabrication	Pessimistic	-20%	32 weeks	+5%
T&C	Pessimistic	-20%	12 weeks	+5%

Schedule Risk Analysis (SRA)

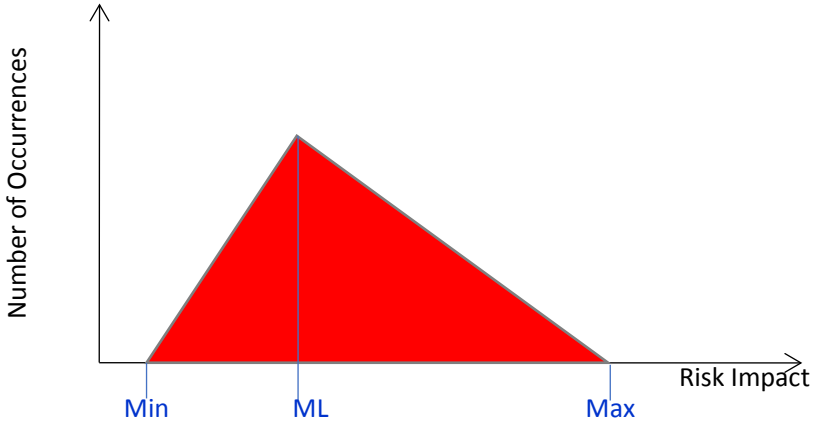
- Duration Uncertainty



Quantifying Risk Events

- Each Risk given a Min,

Most Likely & Max impact

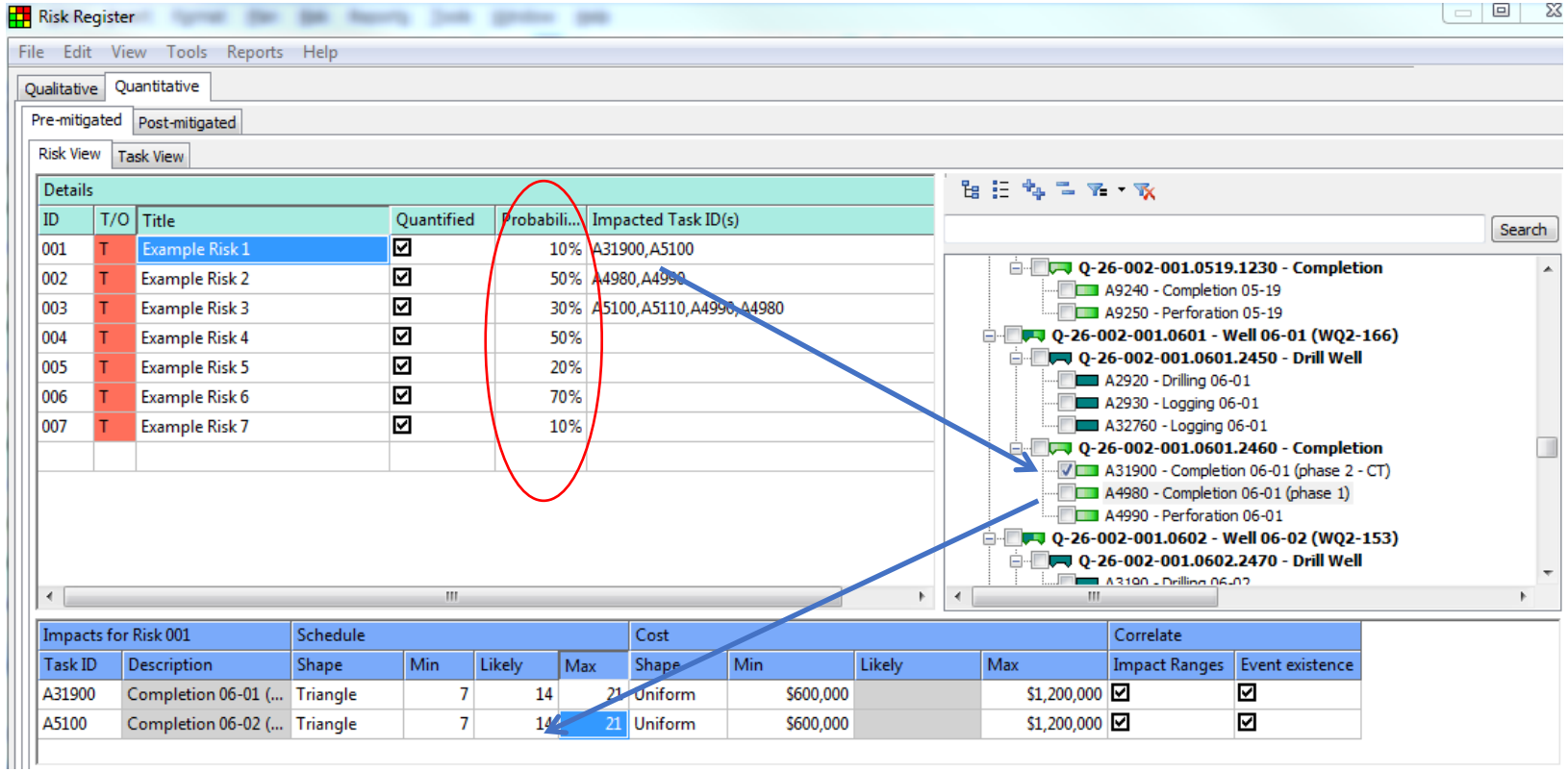


- Min = Optimistic but realistic outcome
- Most Likely (ML) = Expected most probable outcome
- Max = Pessimistic worst case outcome
  - Should not include force majeure or project stopping outcome

- In Accordance with qualitative probability chart each risk is given a probability of occurrence.

Probability	Min	Most Likely	Max
30%	1 week	4 weeks	8 weeks
30%	$100k	$250k	$1m

Schedule Risk Analysis (SRA)



- Risk Mapping to Plan
- Can be multiple activities
- Entering Schedule Delay impacts (Min, ML, Max)

Monte Carlo Analysis

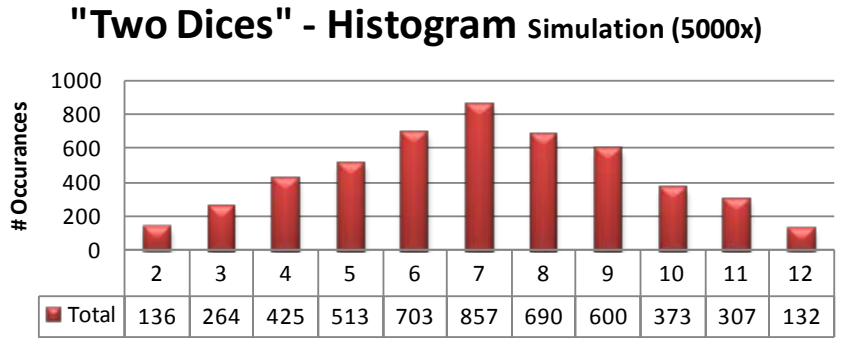
Quantification & Risk Analysis

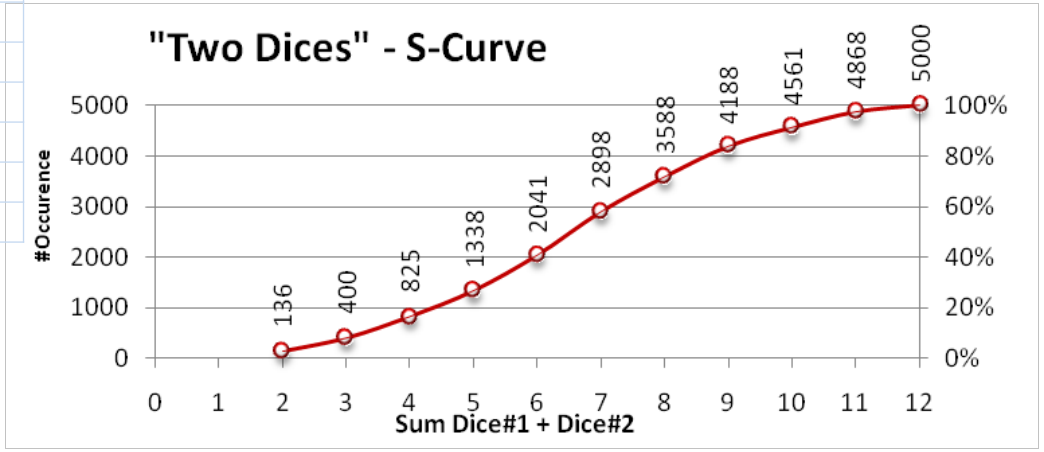
Quantitative Risk Analysis - Distribution

What is a Distribution?

- Graphical representation of occurrences of a variable, e.g. cost, duration, date, etc.
- Example: “Two Dice”

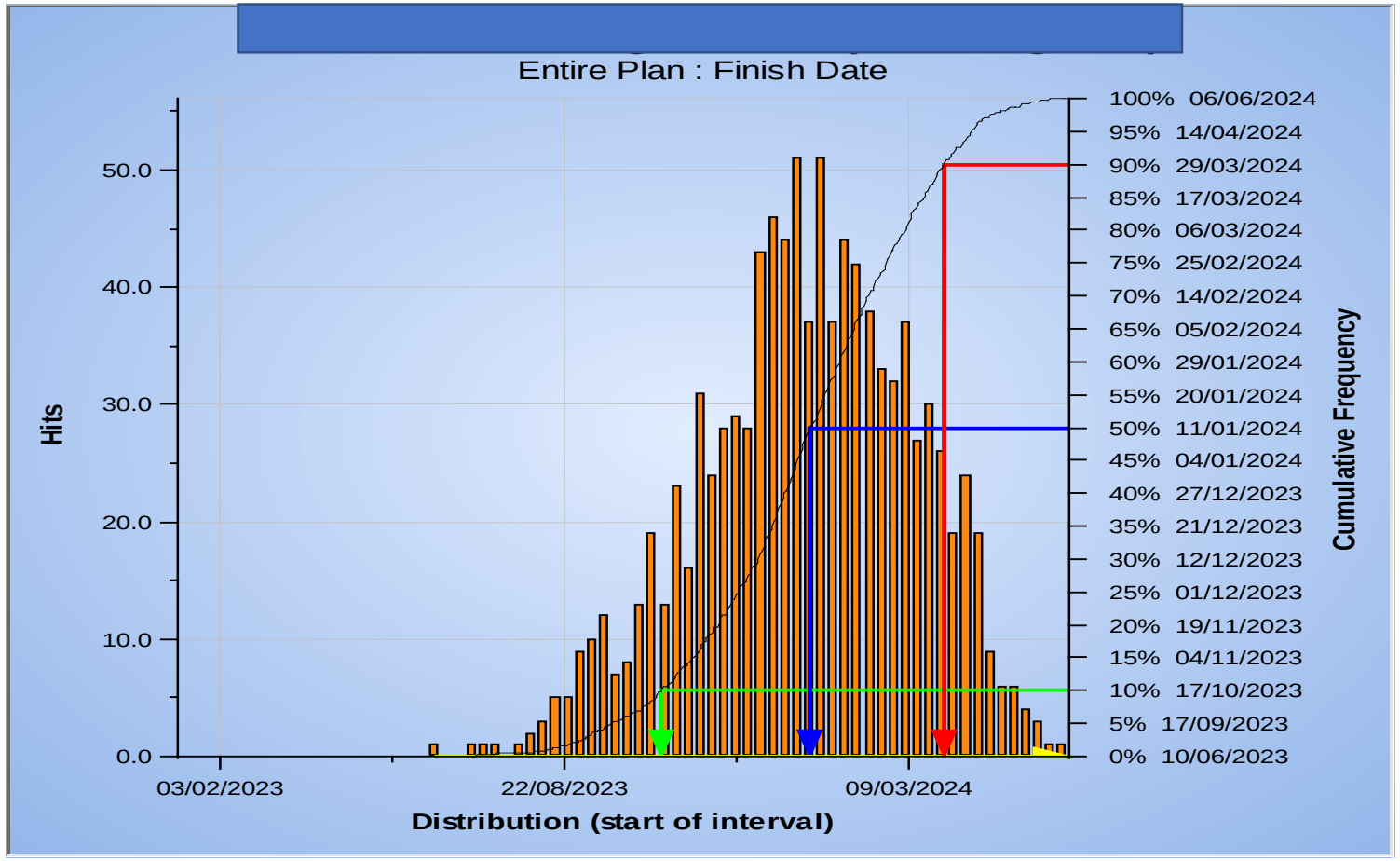
Sum Dice#1 + Dice#2	# Occurrences Dice#1 + Dice#2	Combinations	# Comb.
2	136	1+1	1
3	264	1+2; 2+1	2
4	425	1+3; 3+1; 2+2	3
5	513	1+4; 4+1; 2+3; 3+2	4
6	703	1+5; 5+1; 2+4; 4+2; 3+3	5
7	857	1+6; 6+1; 2+5; 5+2; 3+4; 4+3	6
8	690	2+6; 6+2; 3+5; 5+3; 4+4	5
9	600	3+6; 6+3; 4+5; 5+4	4
10	373	4+6; 6+4; 5+5	3
11	307	5+6; 6+5	2
12	132	6+6	1
Grand Total	**5000**		





Schedule Risk Analysis (SRA)

- Montecarlo Analysis plots potential finish dates for each activity/milestone over 1000 iterations and creates an S-curve of probabilistic outcomes.



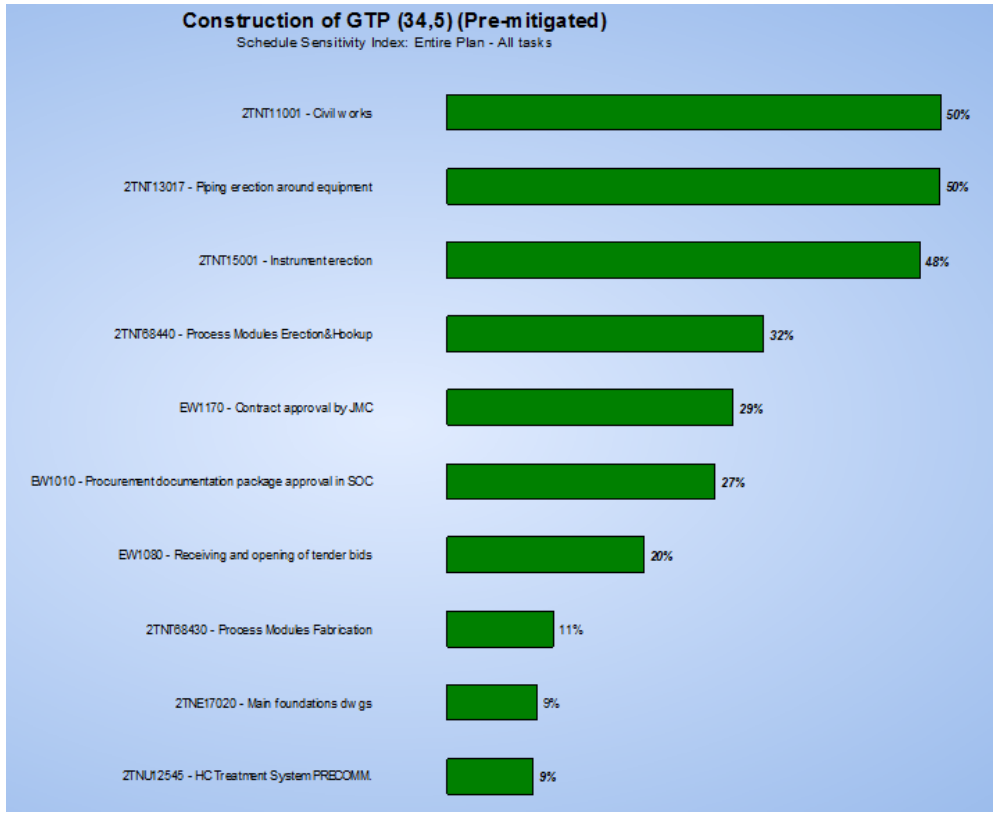
Schedule Risk Analysis (SRA)

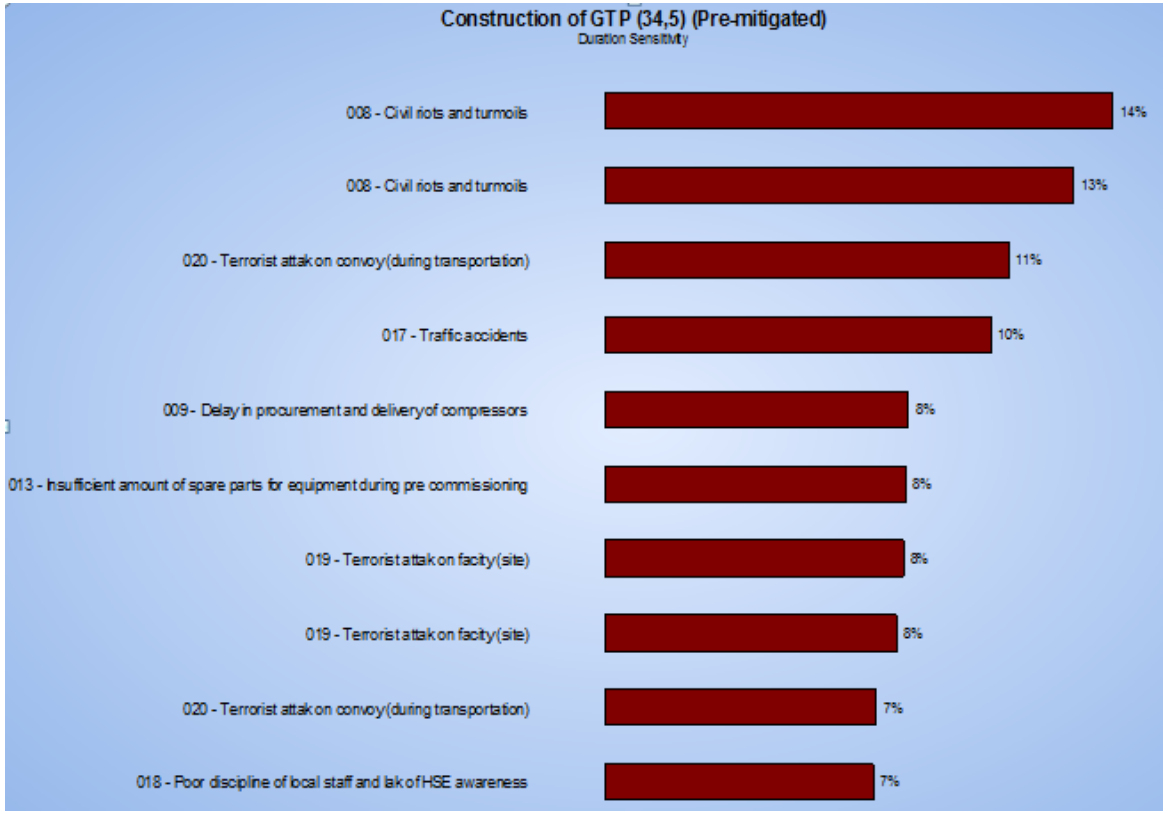
- Analysis calculates the **probabilistic** (Not actual) completion dates of milestones/activities

- Therefore P50, P90 etc are created from statistical outputs of 1000 different randomly generated outcomes based on input data.

Schedule Risk Analysis (SRA)

- Top Risks & Top sensitive Activities Identified
  - These can then be areas of focus for improvement and mitigation
  - These can named or omitted on Insurance policies





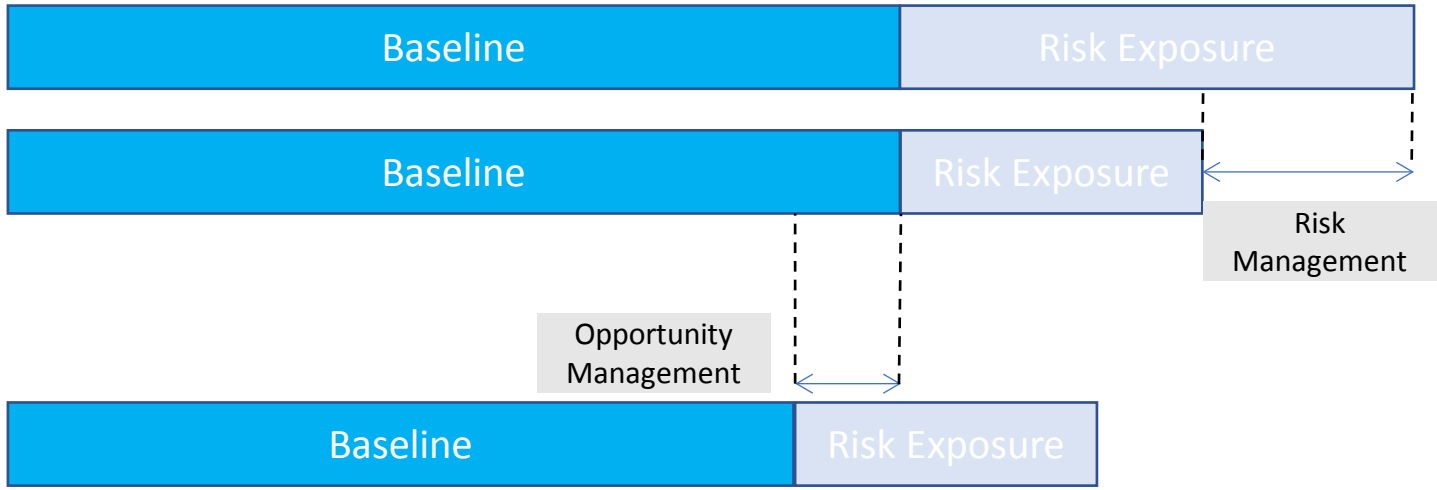
Schedule Risk Analysis (SRA)

- “What If” Scenarios
  - Tool to understand effect of mitigations and schedule changes
- Change Risk Profile and Run analysis to understand effect of mitigation of key risks
  - Omitted risks etc
- Value Management
  - Option Selection/analysis
  - Identify key activities (Critical and Duration)
  - Change Schedule (parallel working, additional resource, reduced scope etc)
  - Reduce Schedule

SRA Applications

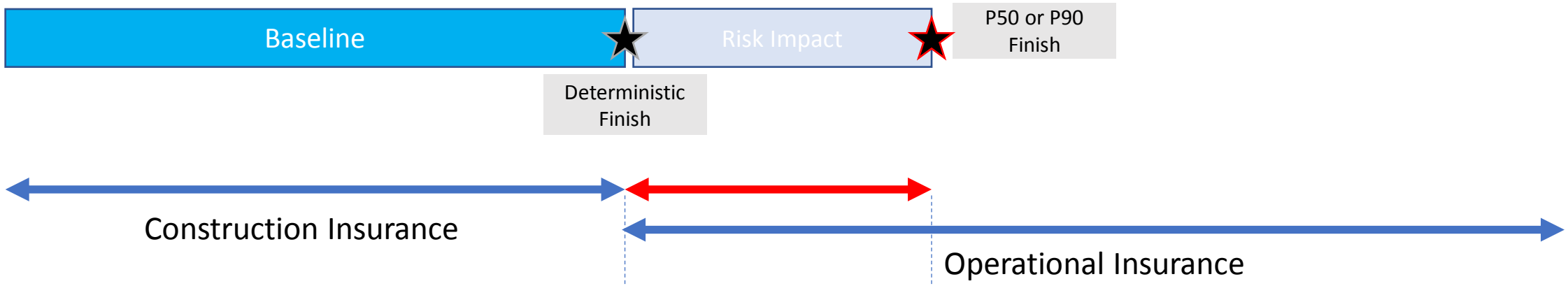
Why?

Schedule Risk Analysis Benefits



- Forecasting for contracts, monitoring, target setting, Insurance
- Identification of Key Activities and Risks
  - Risk Mitigation Focus
- Promotes Project and Schedule understanding

Insurance Coverage



- Re-Negotiations
- Time
- Fees
- Admin
- Numerous Iterations / Updates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Benefits
Insured & Insurer
BBC CITRINE
BBC Chartering

Project Benefits

- **Key to ensuring project success**
  - Identification of project interdependencies
  - Management of Risk to allow project completion of time and on budget
  - Helps control the cost of a project
  - Validation of Project Information
  - Fosters a Clear Understanding of Challenges ahead
  - Improved Project Communication
  - Improved Schedule / Cost Performance

ERM Benefits

- **PRM compliments and enhances ERM**
  - Provides more complete data for better decision-making
  - Effective Project Portfolio Management
  - Improved Stakeholder Satisfaction
  - Encourages Lessons Learned
  - Helps to validate & improve project control measures
  - Option Analysis for better decision making
  - Quantification of Risk for financial & schedule forecasting
    - Cashflow
    - Insurance cover dates and finance

Insurer & Broker Benefits

- **Processes:**
  - Auditable and Accountable Process
  - Identifies Key Risks & Uncertainties which can be named on policies with different rates, excesses etc
  - Information Sharing (Early) and Transparency
  - Milestone Focus… MC, T&C (LMA5197A), RFSU or Phased handovers etc
  - Removes Bias, Heuristics and Independent Analysis removes internal politics
- **Time, Fees & Costs:**
  - Mitigation Focus…less claims
  - Dates with more certainty
  - Insurance cover dates / Construction to Operations
  - Provides more complete data for better decision-making and forecasting

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Independent

For Better Results

Independent Analysis

- Collaboration between Insurer/Broker and Project/Client
- Independent commission
  - Risk Analysis Expert & Industry Planner
  - Test Schedule, Uncertainty and Risks
  - Run Analysis
  - Provide Report and Feedback
- Basis of insurance, fees, transition periods and future negotiations and relationship
- Removes internal bias, politics and agendas
- Shared Costs

Conclusion

Collaboration for mutual benefit.
Greater certainty, less admin, set fees, smoother transition of insurances, better forecasting and financial planning

Relationship
Improved

Overruns & Admin
Reduced

Fees
Fixed