

Acumen Project Analytics

An Introduction to Primavera Risk Analysis (PRA)

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Acumen Introductions

- ④ Dr. Dan Patterson, PMP
 - ④ 20 years PPM experience, risk & schedule analytics expert
 - ④ Acumen founder, Pertmaster co-founder, Primavera
- ④ Acumen: Project analytics
 - ④ Headquartered in Austin, TX; Houston office
 - ④ Oracle partner: accredited Pertmaster trainer
- ④ Core Business Units
 - ④ Risk workshops: world renowned
 - ④ Project analytics: schedule analysis
- ④ Project analytics tool: **Acumen Fuse®**

Introduction to Primavera Risk Analysis (PRA) formerly known as Pertmaster

- ④ High-end risk analysis tool
- ④ Combination of quantitative analysis & qualitative assessment
- ④ Uses a Monte Carlo simulation
- ④ Integrates with P3, P6, MS Project, Open Plan
- ④ Fully fledged risk register tool

Project Risk Assessment using PRA

- ④ Objectives
 - ④ Develop highly accurate **risk-adjusted** forecasts
 - ④ To determine **risk exposure (cost/schedule)**
 - ④ To identify **risk hot spots (drivers)**
 - ④ Calculate required **contingency/mitigation**
 - ④ Identify alternate **risk-reduction** scenarios
- ④ Defendable & achievable **schedule basis...**
- ④ Risk Model Types
 - ④ Cost
 - ④ Schedule
 - ④ Integrated cost/schedule

Improving Schedule Realism: S1 > S5

S1

- **Non-Critiqued**
- Non-validated, buffered?, questionable realism, target driven?

S2

- **Critiqued Schedule using Metric Analysis**
- Structurally sound, no built in contingency, sound logic

S3

- **Risk-Adjusted Schedule**
- Estimate uncertainty, risk events, calculated contingency

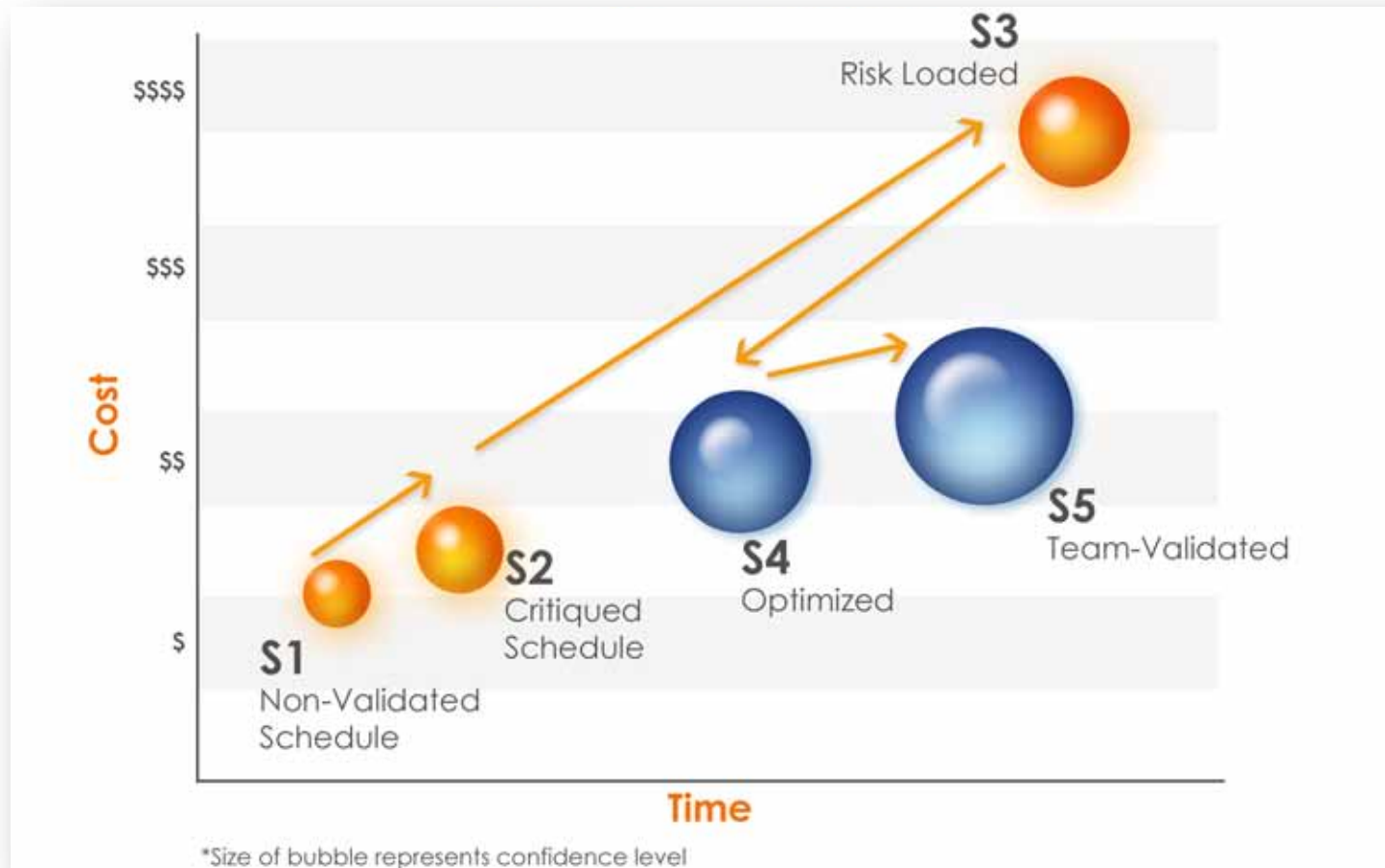
S4

- **Optimized Target Scenario**
- Reduced hot spots, lower criticality, higher confidence

S5

- **Team Validated Optimized Model**
- Buy-in on S4 optimized model

S1 > S5 Target Evolution

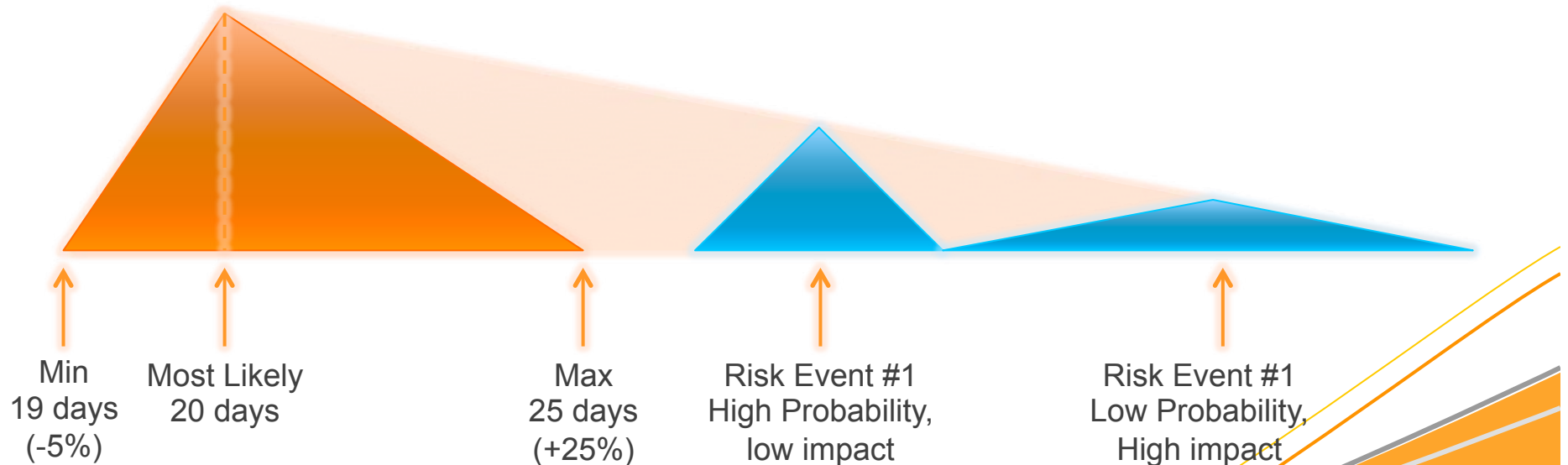


Uncertainty Ranges & Risk Events

20 day Aggressive Duration

+

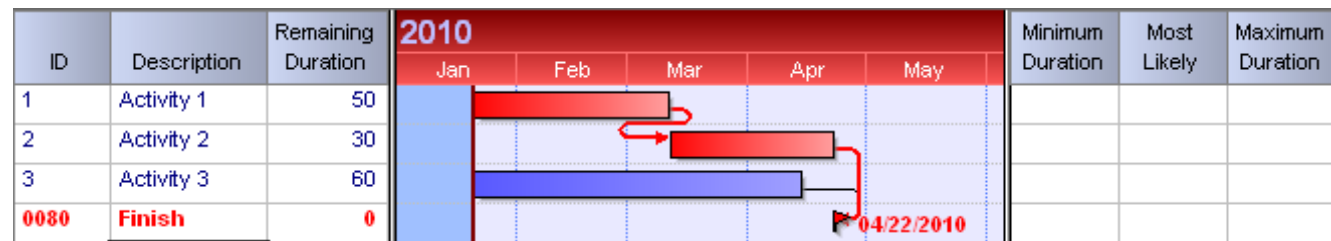
Risk Event Schedule Impact



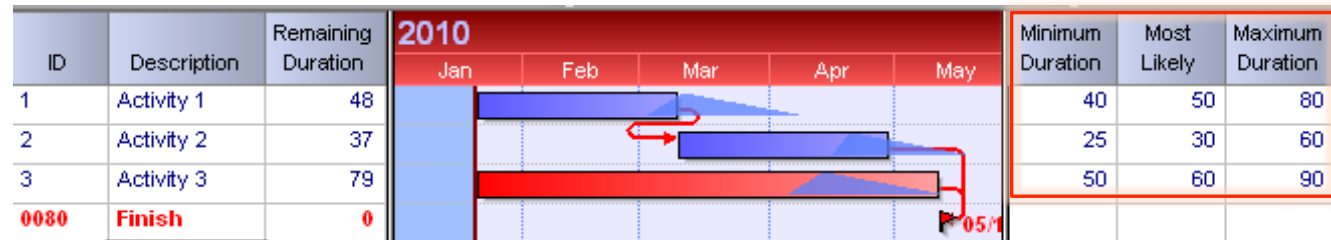
- ✓ Separate uncertainty & risk events
- ✓ Results in much more accurate model

Modeling Risk in PRA

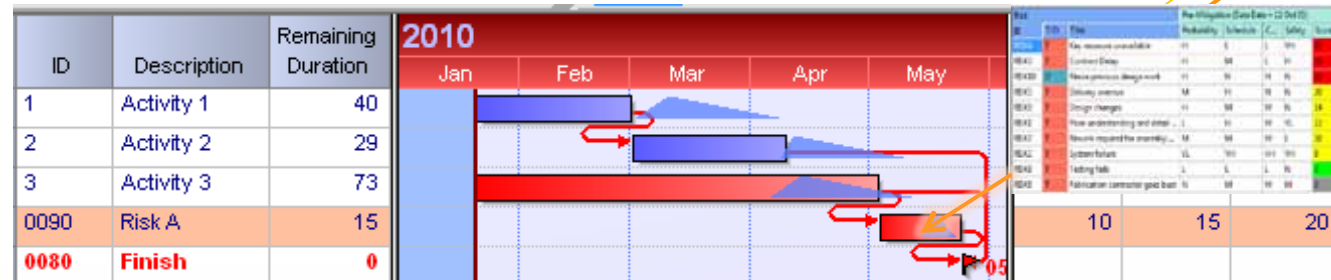
Sound Schedule Basis



Valid Uncertainty Ranges



Relevant Risk Events from a risk register



Alternate Approaches to Building an S3 Risk Model

1) Risk Load only the (near) critical path

🔍 Pros

- 🔍 Focuses the team in a workshop
- 🔍 Based on actual schedule

🔍 Cons

- 🔍 Assumes known critical path
- 🔍 Risk events make this approach flawed
- 🔍 Dangerous approach to risk modeling
- 🔍 Doesn't give true picture of risk

Alternate Approaches to Building an S3 Risk Model

2) Create a summary schedule

🕒 Pros

- 🕒 Excellent means by which to facilitate a workshop
- 🕒 Easy to risk load/build risk model

🕒 Cons

- 🕒 Lose the logic integrity/calendars/detail of a schedule
- 🕒 Separate model to maintain to that of schedule

Alternate Approaches to Building an S3 Risk Model

3) The Post-It note/Excel approach

☑ **Pros**

- ☑ Easy brainstorming technique

☑ **Cons**

- ☑ Extremely high level
- ☑ Not based on a CPM schedule
- ☑ Very far removed from basis of schedule

Alternate Approaches to Building an S3 Risk Model

4) Risk ranging against the actual project schedule

🔍 Pros

- 🔍 Retains true integrity of the project schedule
- 🔍 Enables risk loading at summary yet analysis at detail level
- 🔍 Requires full schedule critique

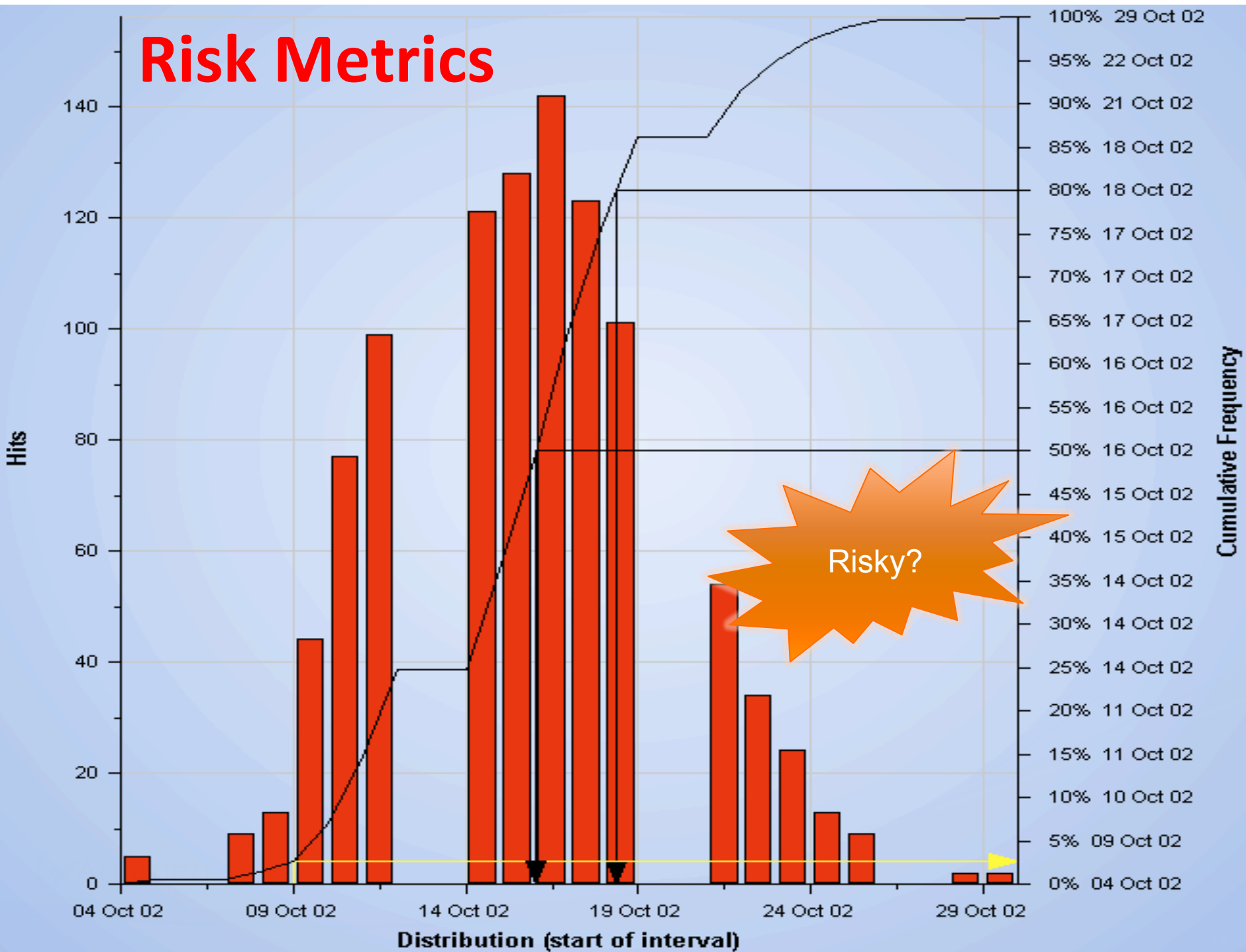
🔍 Cons

- 🔍 Requires disciplined facilitation
- 🔍 Observation of Central Limit Theorem

Accurately Modeling Uncertainty

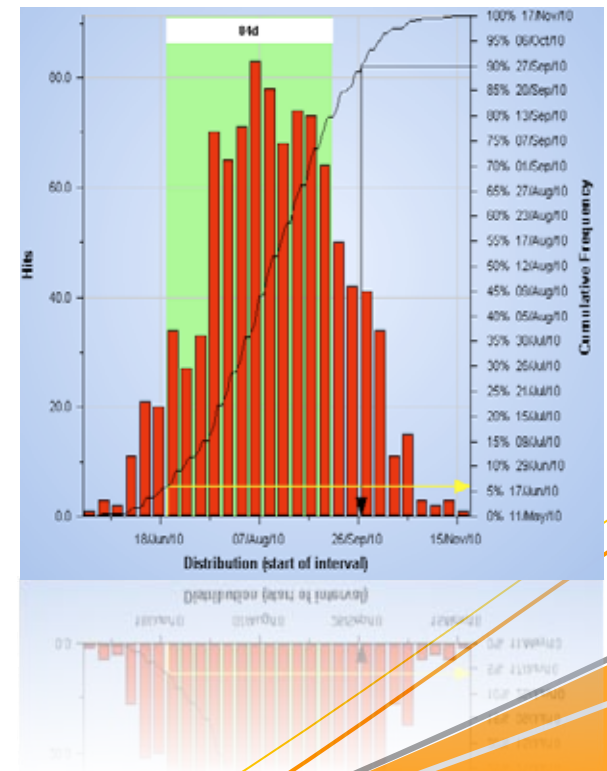
- ④ Based on templated approach
 - ④ Risk factors
 - ④ Groupings of activities are categorized
 - ④ Focus on scope/complexity
 - ④ Typically a much smaller driver than events
- ④ Assume:
 - ④ Normal working conditions without events
 - ④ Focus on durations and not dates
- ④ Approach:
 - ④ Don't think about the knock-on effect
 - ④ Don't focus on critical path

Risk Metrics



Risk Exposure Metrics

- ✔ Confidence level
 - ✔ Schedules inherently have low confidence level
 - ✔ (*merge bias*)
 - ✔ Low confidence not necessarily high risk
- ✔ Risk Range
 - ✔ Sound risk exposure indicator
- ✔ Risk Drivers
 - ✔ Key activities that need to be addressed
- ✔ Contingency
 - ✔ Reactionary response to risk
- ✔ Mitigation Strategy
 - ✔ Pro-active response to risk exposure
 - ✔ Carries cost/effort



Intelligent Risk Metrics

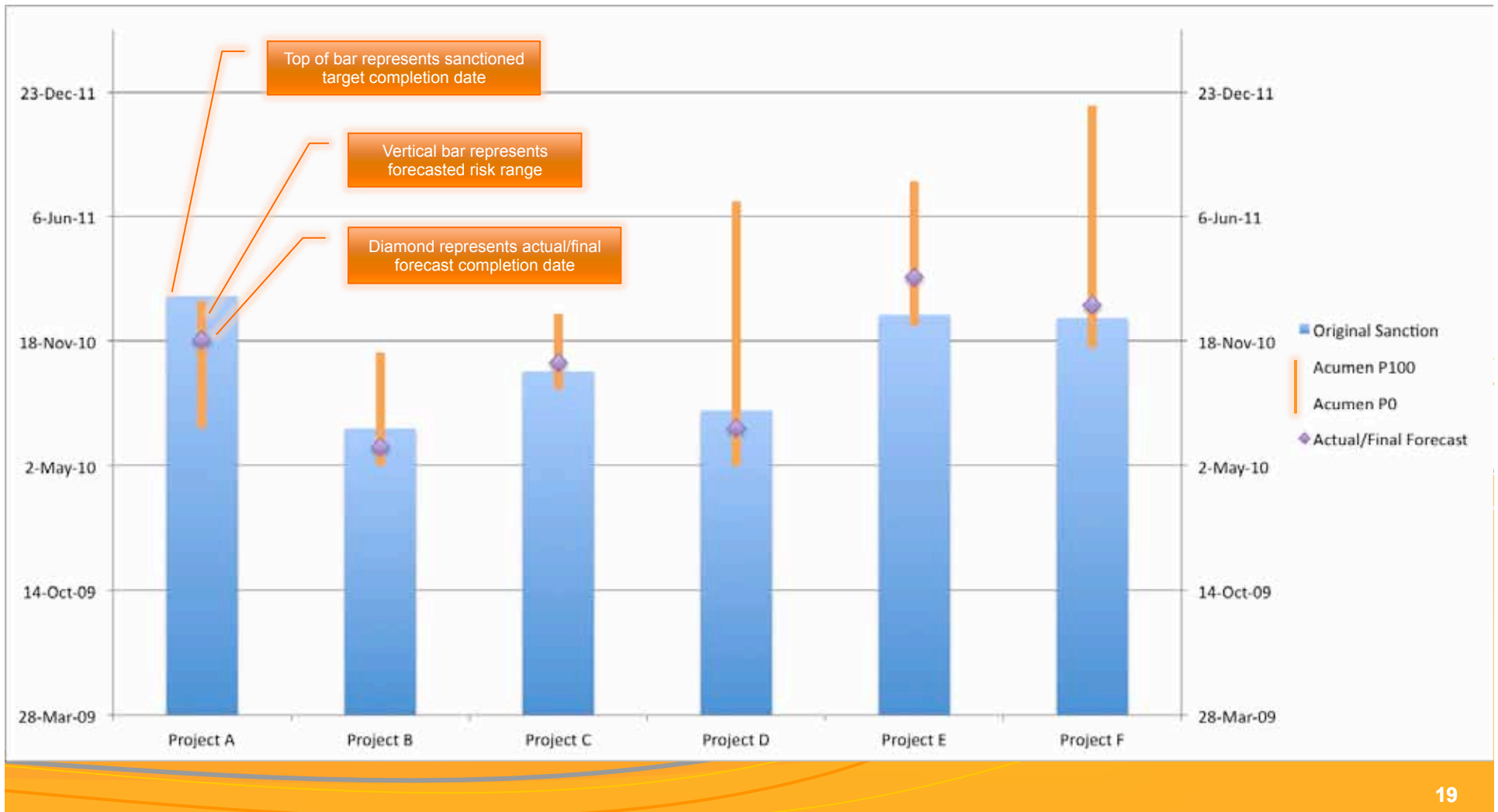
- ④ Hidden critical paths
- ④ Risk hot spots
- ④ Risk range factor
- ④ Paths carrying most risk exposure
- ④ Time phasing risk (front/back end loaded)
- ④ Correlation between poor planning & risk?
- ④ Discipline/location comparisons

PRA Demo

When to Conduct a Risk Assessment

	Pre-FEED / Appraise	FEED / Select	Define	Execution	Operations
Characteristics:	Value proposition, Feasibility studies	Concept development, alternate scenarios	Long lead placement, EPC, Major contracts	Project delivery	Revenue generation
Risk Model:	Initial Risk Appraisal	Capital Value Analysis	Project Risk Analysis	Risk Performance Analysis	Asset Lifecycle Analysis
Acumen Phase:	Risk Register Development	S1 > S3	S1 > S5	S1 > S5	NPV, Probabilistic cashflow
Value-Add:	Qualitative basis	Decision support	Baseline Analysis	Ongoing risk exposure	Strategic risk value

Acumen Schedule Risk Forecasting Accuracy



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