



Implementation of Program/Project Risk Management

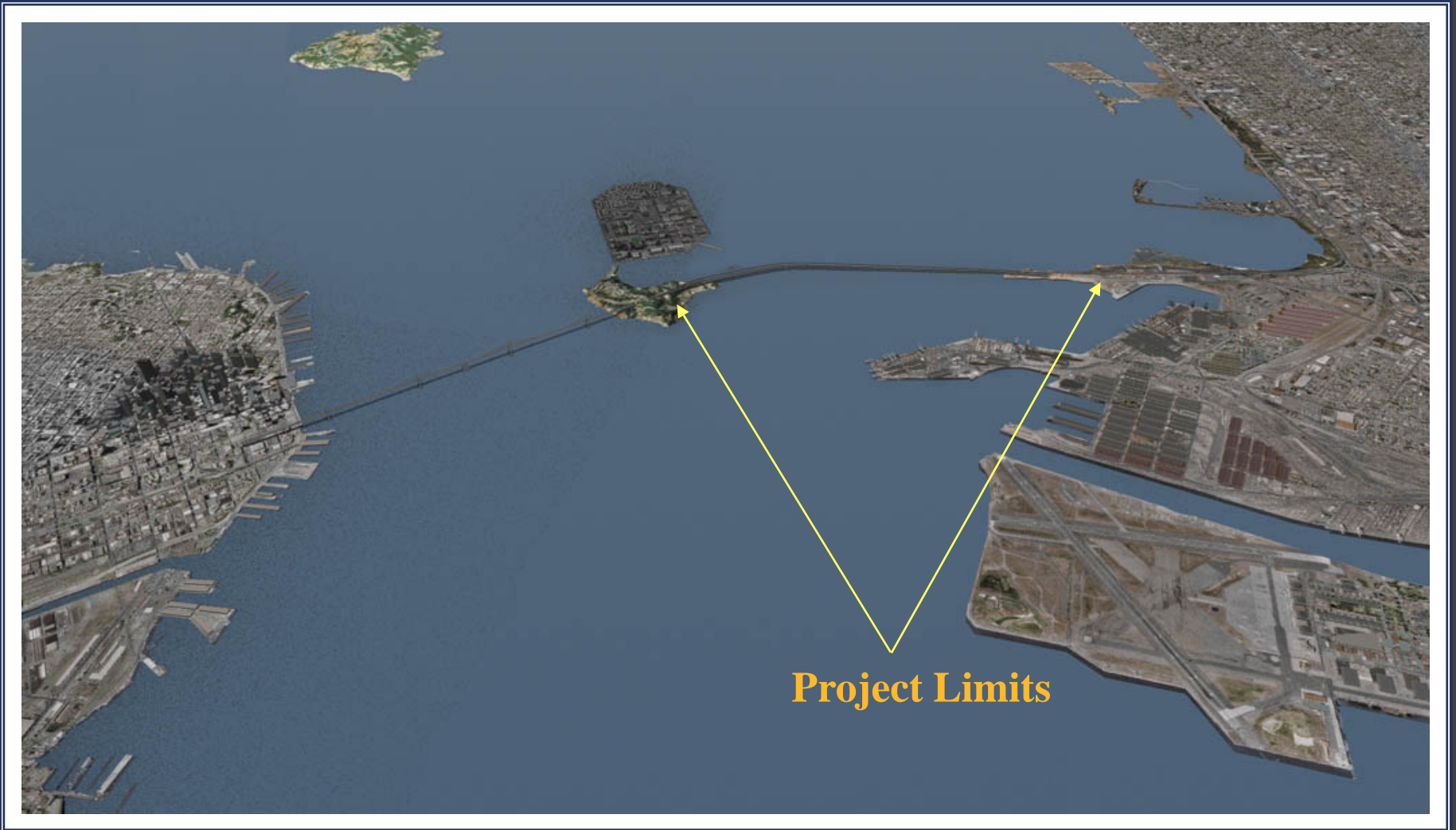
Western Bridge Engineers' Seminar
September 9-11, 2015
Reno, Nevada

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Senior Bridge Engineer/Risk Manager



San Francisco Oakland Bay Bridge



New East Span Replacement Project

Why We are Doing This – Race Against Time



Existing Bridge After 1989 Loma Prieta Earthquake

Signature Span – Self-Anchored Suspension Bridge



Removal of the Old Span Began Right After Opening



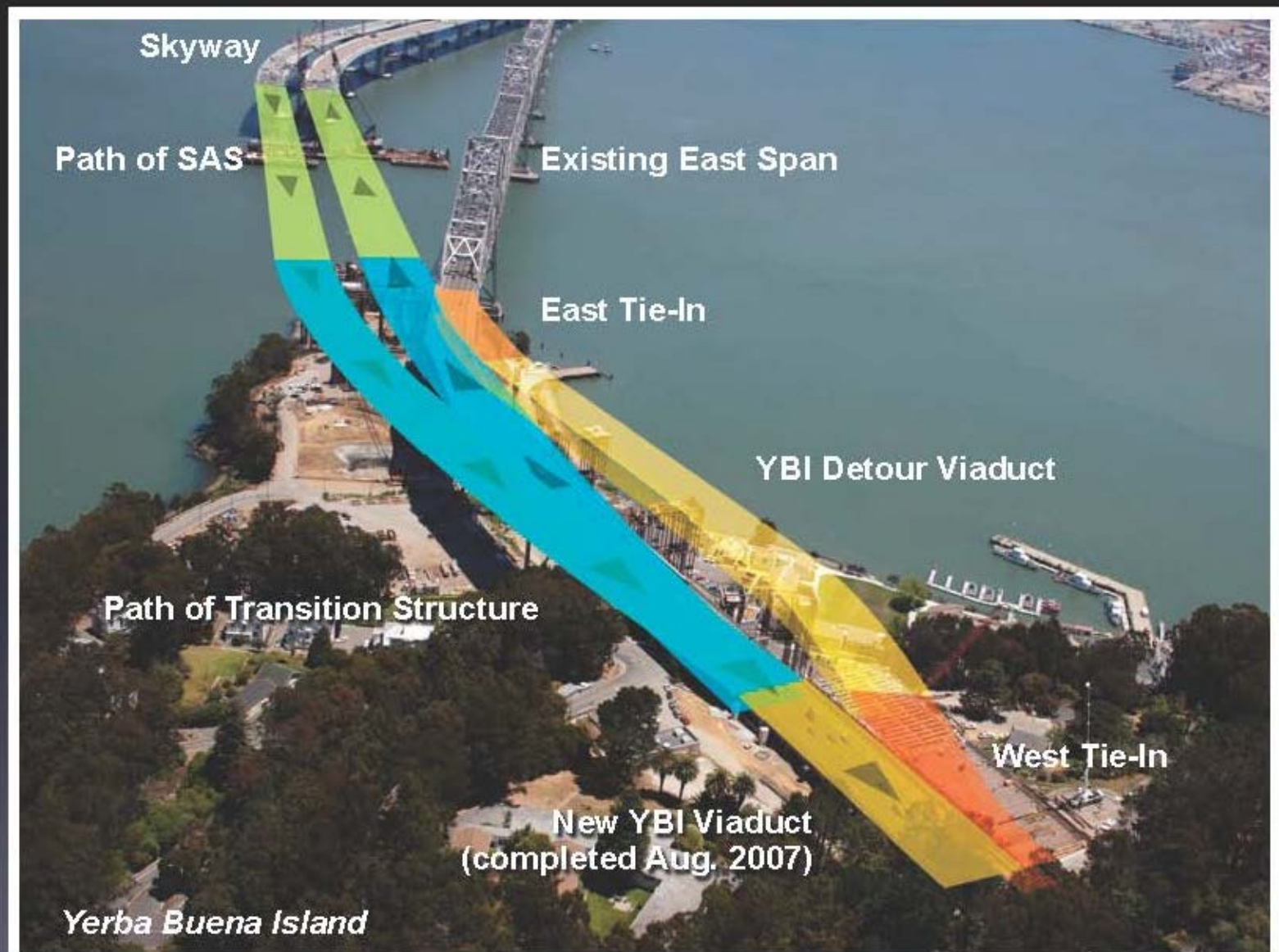
San Francisco - Oakland Bay Bridge

Self-Anchored Suspension Bridge Contract Largest Construction Contract of a Multi-Contract Corridor

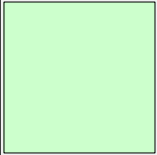


Difficult engineering and construction challenges

Complex program with multiple construction sequences...



Multiple **Interdependent** Contracts



What is Risk??

Risk is an uncertain event or condition that, if it occurs, will have an positive or negative impact to project objectives ... Paraphrased from PMBOK

Ways to Deal with Risk

- Transfer - Make Contractor Responsible
 - Accept – Department is Responsible
 - Mitigate – Do Something(s) to reduce
 - Avoid – Don't do (Not really Applicable to Const.)
-

How we got started...



Advertised for construction bids



Oops...



1. **Single Bid**
2. **50% above Estimate**



Additional Funding Authorized by...



Conditions in AB144...



Implement “Comprehensive Risk Management”



Periodically “Check Adequacy of Reserves”



Oversight
Committee

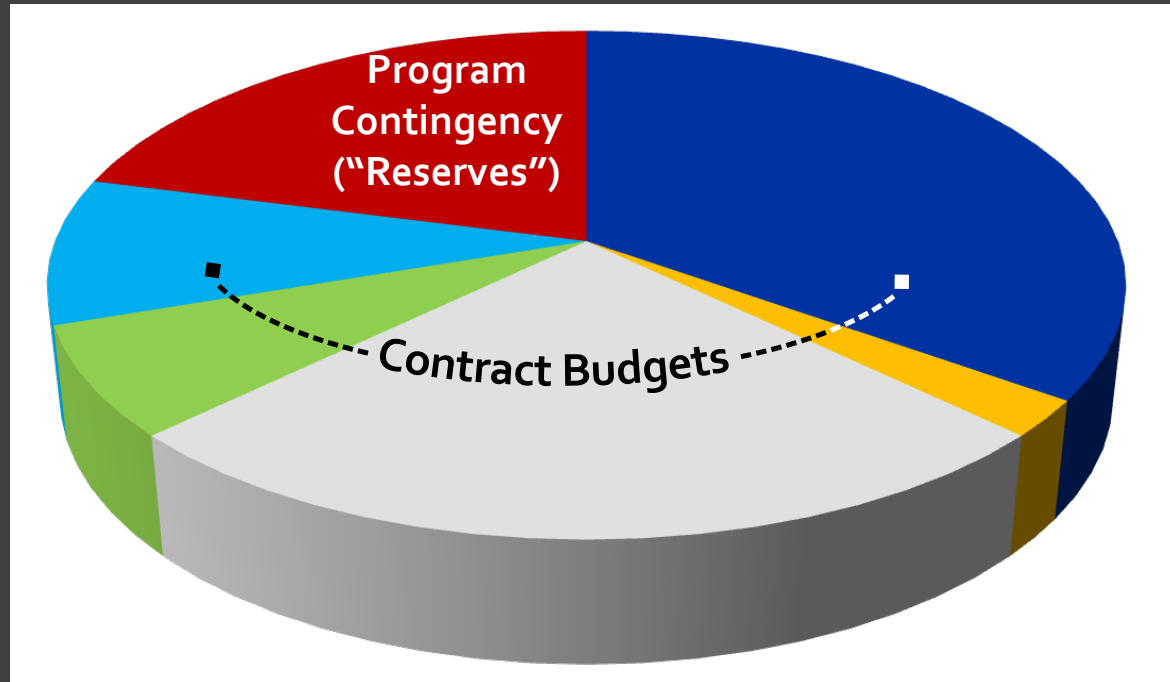
AB 144 Legislation requirements...

"comprehensive risk management"

Requires **cost and schedule** risk analysis

"assess adequacy of reserves"

Requires **quantitative** risk analysis

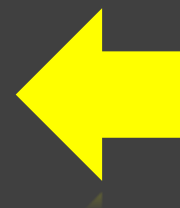


Organizational Challenges

Multiple Agencies



Oversight Committee



Approves Expenditures Over \$1 million

Multi-level Management



Program Management Team

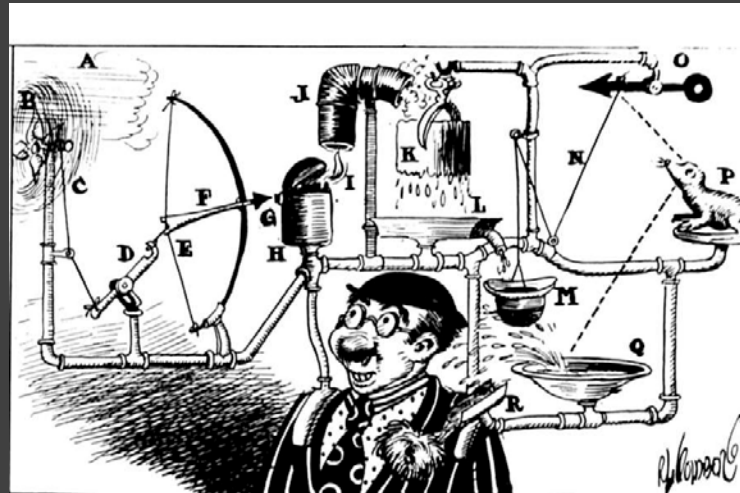
Individual Project Teams



People Challenges...



"Don't have time"



"Too Complicated"



"It's a pile of..."

Keys to Implementation



Keep it simple



Comfortable



Baby steps



Prove value

Organized for Risk Management...

Multi-functional Risk Team

Agency
Representatives

Consultant
Representatives
& Experts



Project Management
Design
Construction
Functional Depts.
Risk Management

Greater Opportunities to Exploit in Design Phase

Risk Management

- Avoid
- Transfer
- Accept
- Mitigate



- Incorporate Lessons Learned into future Designs and/or Risk Management Plans
- Advance Planning – Survey, Testing and Sampling, Revised Specifications
- Project Delivery Methodology – Contract Management/General Contractor (CM/GC)
- Revisions to Seismic Retrofit Strategies
- Proper Planning → Better Contracts

Designers Develop Plans, Specs & Estimates for Construction Contracts

Getting Started – Risk Register

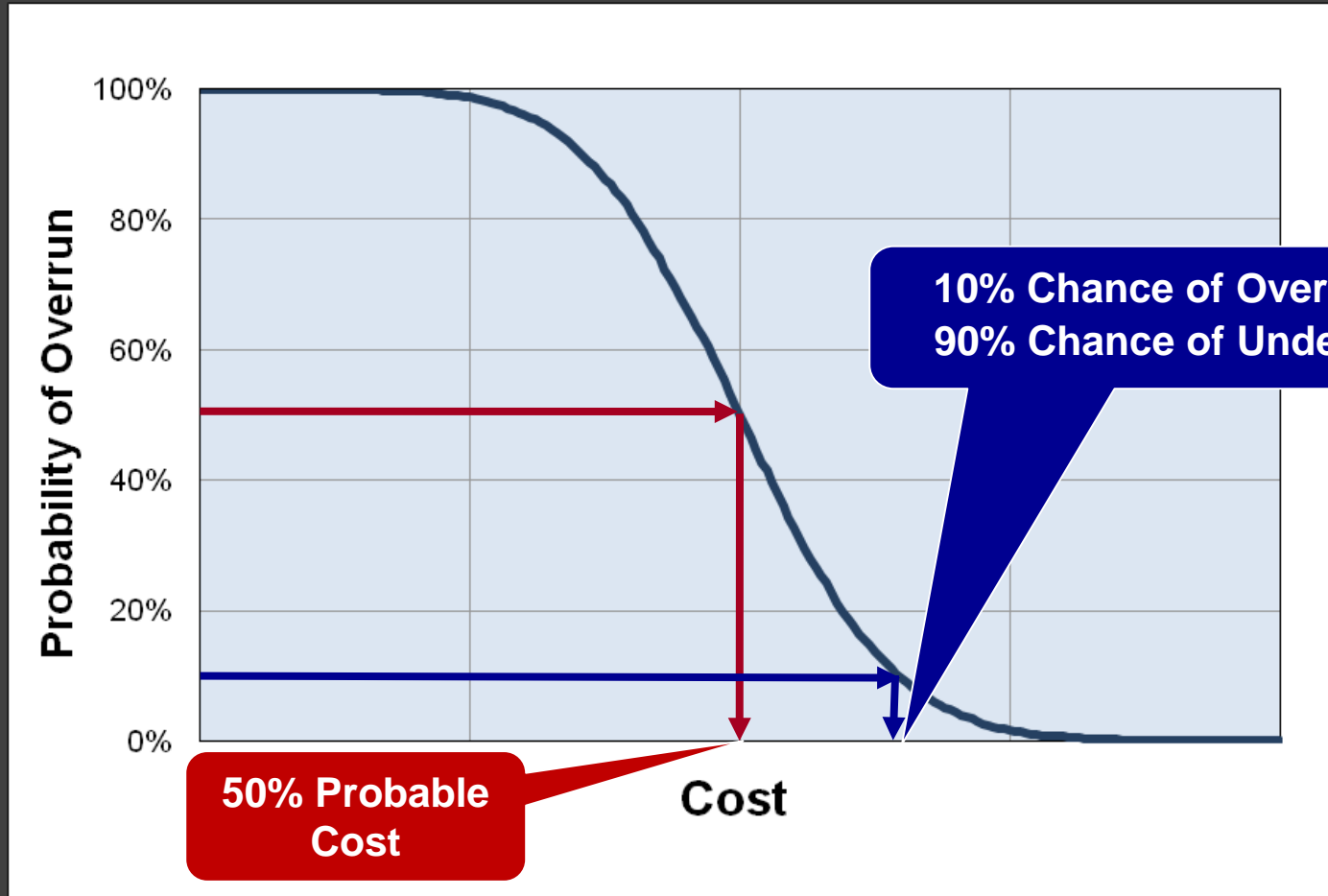


“Risk is uncertainty that matters.”



- **Risks** – may or may not happen, uncertain impact if happens - (+ or -)
- **Contract Change Orders (CCO)** – have happened, cost is uncertain
- **Notices of Potential Claim** – probability of becoming a CCO, uncertain cost of CCO
- **Cost of Delay** – from schedule risk analysis

Explained the Cost Probability Curve...

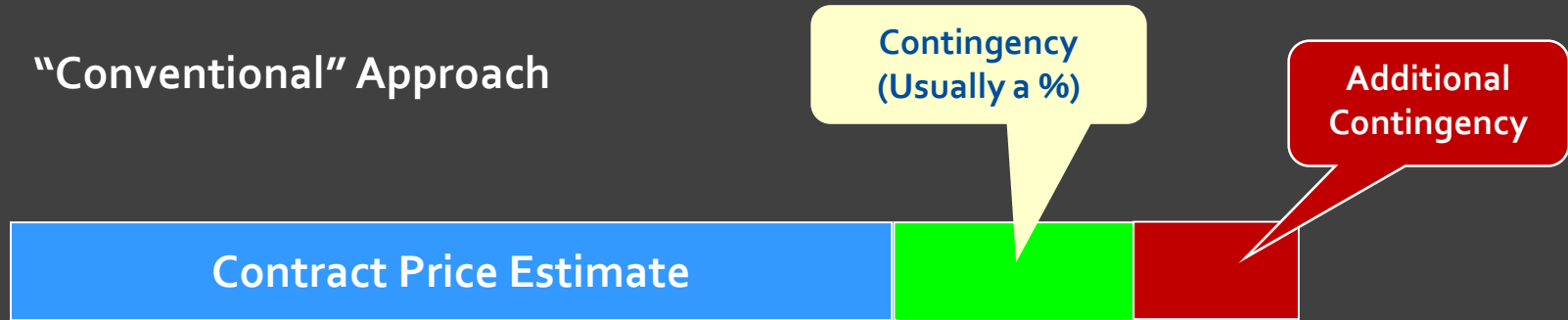




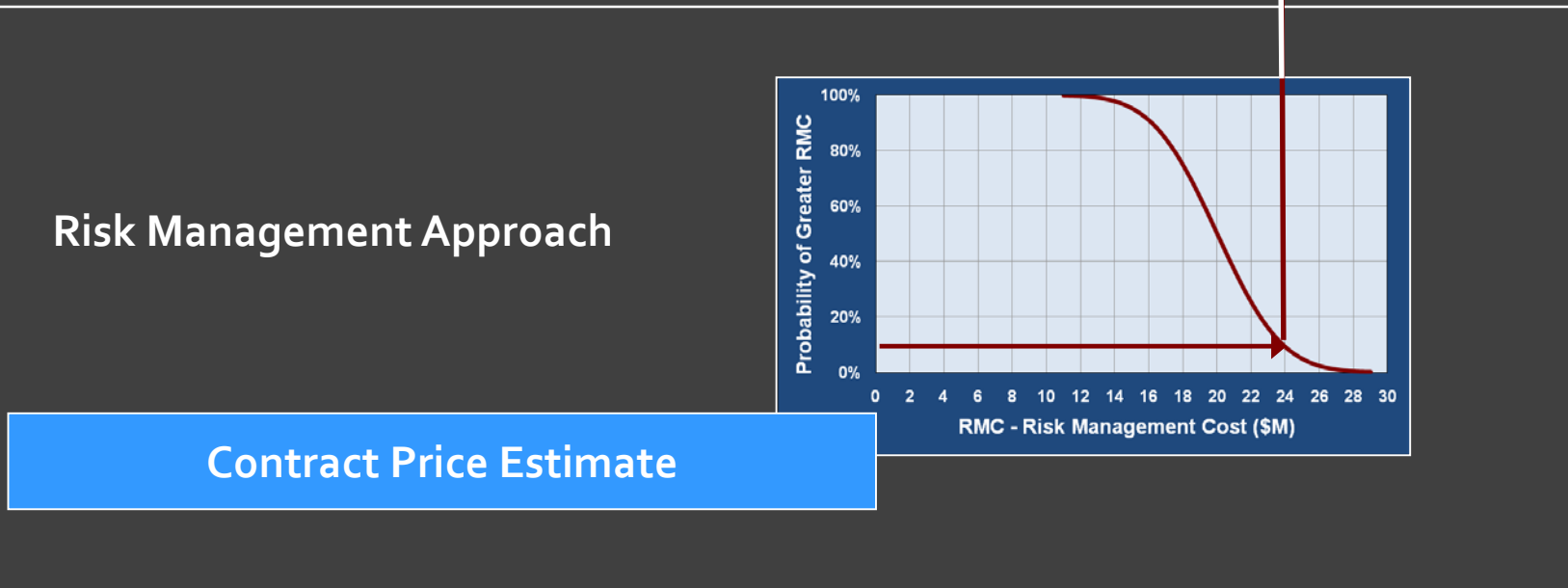
How do we use this?

Validate Contingency in Design Phase

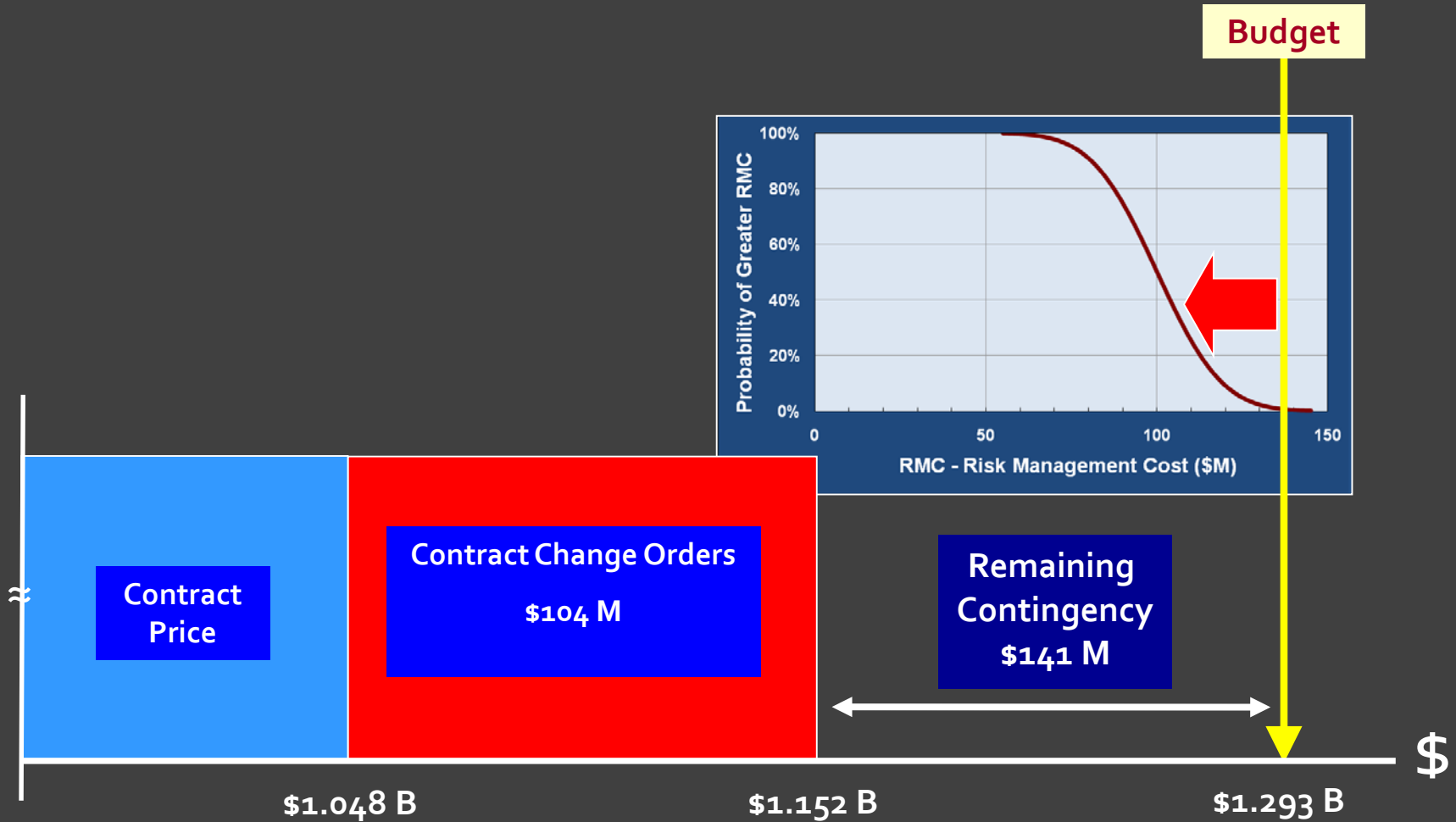
“Conventional” Approach




Risk Management Approach



For Budget Analysis During Construction



A background image consisting of numerous US one hundred dollar bills scattered across the frame. The bills are slightly out of focus, creating a sense of depth and abundance. The green and white colors of the currency are prominent. In the center, there is a solid green rectangular box containing the text "Value of Risk Management" in white, sans-serif font.

Value of Risk Management

Risk Transfer on Superstructure Removal of Existing Steel Structure



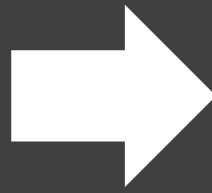
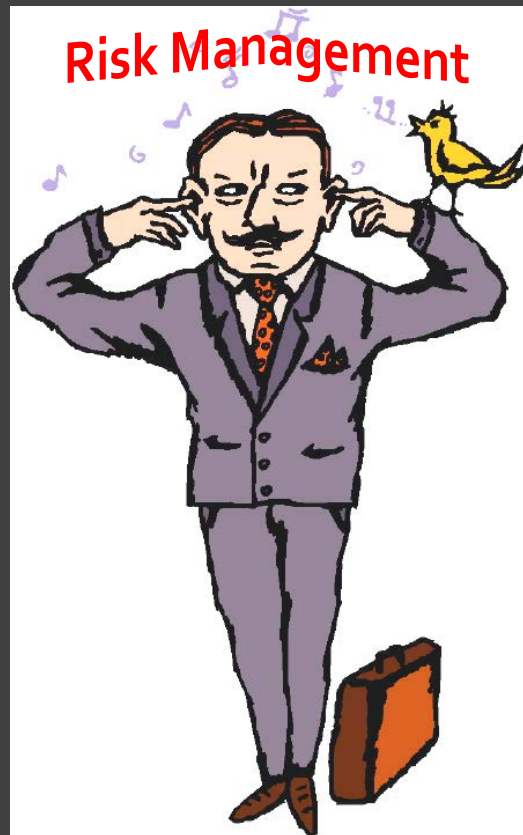
- Recognition of Complexity of Removing a 75 year old Cantilever Truss
- Bridge Removal Plans were Stamped by a Designer and Independent Checker hired by the Contractor
- Environmental Monitoring – Bird Mitigation Strategies

Removal of Marine Foundations



- Construction Manager General Contractor Project Delivery Method
- Environmental Buy-in of Implosion through Demonstration Project
- Contractor Develops Means and Methods in Design Phase to Aid in the Acquisition of Permits

Where are we now?



Questions?



Project Risk Management

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