Advanced Risk Management Techniques

NK Shrivastava, PMP, RMP, ACP, CSP, SPC4

CEO/Consultant/Agile Coach - RefineM

RefineM PROJECT MANAGEMENT CONSULTING

www.RefineM.com

Agenda

1. What is Virtual Lunch & Learn
2. Your Expectations from this Webinar
3. Introduction – Myself
4. Advanced Risk Management Techniques
    a) Overview of Risk Management
    b) Quantitative Analysis Including Expected Monetary Value (EMV)
    c) Developing and Using Risk Contingency Reserve
    d) Risk Metrics Including Risk Contingency Reserve Ratio
5. Upcoming Learning Opportunities from RefineM
6. How to get 1 PDU for this Webinar?
7. Rewarding Our Star Attendees
8. Q & A
9. Supporting Slides

RefineM's Virtual Lunch & Learn

This is a monthly webinar delivered during the lunch hour in the first week (Wednesdays) of every month.

It's designed to help you learn while you eat lunch, providing a relaxed environment to enhance your experience.

The monthly webinars will cover a variety of Project Management / Agile topics.

Your Expectations

What are your expectations from this webinar?

Why are you here today?

NK Shrivastava, PMP, RMP, ACP, CSP, SPC4

RefineM

Helping organizations turn their project management capability into a *competitive advantage*

CEO/Consultant since Dec 2011

- Agile Transformation/Coaching/Adoption
- Project Management/ Process Improvement Consulting and Training
- Products for Project Professionals
  - Essential Gear for Project Managers
  - PMP Exam Simulator

My professional journey b/f RefineM

20+ years of Successful Project Leadership

- Led 100s of projects of all sizes, successfully
- Recovered many projects, saved millions of $
- Implemented numerous process improvements
- Coached/mentored 100s of PMs, and executives
- Board Member – SWMO PMI Chapter (2008-2014)

Advanced Techniques in PM

1. Overview
2. Advanced Stakeholder Management
3. Advanced Scope/Change Management
4. Performance Measurement Using EVM
5. **Advanced Risk Management**

What else do you consider advanced skills?

Who Can Use These Techniques?

* Experienced project managers
* May or may not have a certification such as PMP®
* PMO leads / directors looking for training for PMs
* PMs looking to take on greater leadership role

Overview of Risk Management

- What is Risk Management?
- Basic Risk Management
- Advanced Techniques

RefineM PROJECT MANAGEMENT CONSULTING

What is a Project Risk?

What is a Project Risk?

Project risk is an *uncertain event* or condition that, if it occurs, has a positive or a negative effect on a project's objectives.

- From PMI's Practice Standard for Project Risk Management – Chapter 2 , Page 9

Risks Vs Issues

Risks	Issues
• A future event • It has not occurred yet but there are chances that it may occur – there is uncertainty • The probability of occurrence can range from 0 to 1 but it is neither 0 or 1 (greater than 0 but less than 1) • The language to describe a risk uses future tense • A response plan is needed in case risk event occurred • Risk Register is used for risks	• An event of past or present • It has already occurred or occurring right now, there is no doubt whether it'll happen or not – no uncertainty • Probability is 1 since it already occurred • The language to describe an issue uses present to past tense • Need a resolution plan with action items to resolve an issue • Issue log is used for issues

What is Risk Management?

- Risk management is:
  - ✓ Planning
  - ✓ Identification
  - ✓ Analysis
  - ✓ Response planning
  - ✓ Controlling risk

- The objectives of risk management are:
  - ✓ Increase the likelihood and impact of positive events
  - ✓ Decrease the likelihood and impact of negative events

Source: Project Management Institute (2013). Guide to the Project Management Body of Knowledge (PMBOK® Guide) Fifth Edition, Section 11, p. 309. Newtown Square, PA: Project Management Institute.

Why is Risk Management Important?

* Scope, time, and cost are all important
* Even the best project plans can be derailed by risks
* Being able to plan for risks is critical
  - ✓ Unforeseen circumstances can always impact a project
  - ✓ But when teams manage risks, they can be better prepared overall

Basic Risk Management

* Building the risk register
* Identifying risks
* Basic qualitative analysis
* Risk response strategies
* Monitoring risks and alerting stakeholders

How to go beyond?

Advanced Risk Management

- Quantitative analysis
  - ✓ Especially Expected Monetary Value (EMV)

- Risk contingency reserve
  - ✓ How to create one for a project or program
  - ✓ How to use the contingency reserve
  - ✓ How to communicate the contingency reserve

Advanced Risk Management

- Quantitative Analysis
  - Quantitative Risk Analysis Overview
  - Expected Monetary Value (EMV)
- Risk Contingency Reserve
  - What is Risk Contingency Reserve?
  - Using Risk Contingency Reserve
  - Communicating Risk Contingency Reserve
  - Limitations of the Model
  - Risk Contingency Reserve Ratio

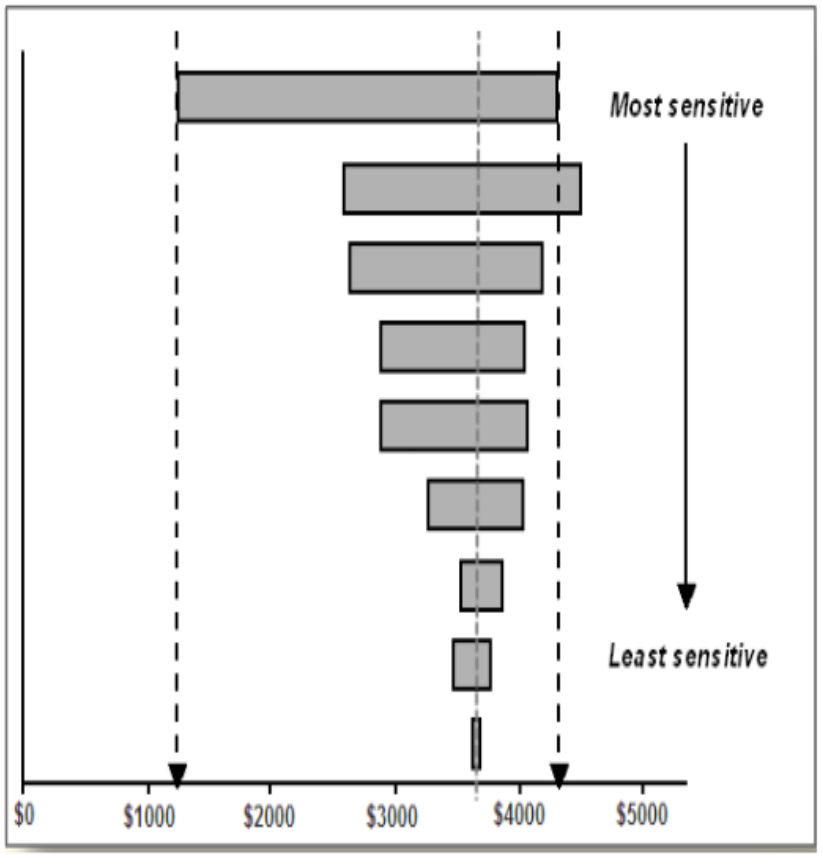
Quantitative Analysis

- Quantitative Risk Analysis Overview
- Expected Monetary Value (EMV)
- EMV Examples

RefineM PROJECT MANAGEMENT CONSULTING

Quantitative Risk Analysis Overview

- Sensitivity Analysis
  - ✓ Risks sorted by potential impact
  - ✓ Also called “tornado diagram”
- Modeling and simulation
  - ✓ Monte Carlo is a popular example
- Expected Monetary Value (EMV) analysis
  - ✓ Simple, effective way to start



Expected Monetary Value

- Expected Monetary Value (EMV) of a Risk
- Probability x Impact
  - ✓ Probability of the risk occurring (percentage)
  - ✓ Impact, if the risk occurred (time or cost measure)

EMV Example #1

There is a 70 percent chance that computers needed for the project team will not be available on time, causing a delay of 5 days.

What is the EMV for this Risk?

EMV (probability x impact)
= 0.7 x 5 days
= **3.5 days**

EMV Example #2

There is a 50 percent chance that a critical piece of equipment will fail during the project and will cost $10,000 to replace.

What is the EMV of this Risk?

EMV (probability x impact)
= 0.5 x $10000
=$5,000

EMV Example Using Days

ID	Risk Description	Event Date	Probability		Impact (Days)		EMV
1	Performance issues are not addressed before testing, causing delays.	Sep-14	H	70%	M	15	10.5
2	Server performance issues may occur during testing, causing delays.	Aug-14	L	10%	M	10	1
3	Unanticipated changes occur after code complete, causing rework.	Aug-14	L	10%	L	5	0.5
4	Testing environment may interfere with other high-priority projects, causing conflicts.	Jul-14	L	10%	M	10	1
5	Implementation priority may change, causing massive delays.	Jul-14	M	25%	H	40	10
6	Impact analysis may cause additional change requests.	Jul-14	M	25%	M	15	3.75
7	Code Complete may be delayed due to developer resource allocation to other projects.	Jun-14	H	50%	M	20	10
8	Testing may be delayed due to differences in rating between two systems.	May-14	M	30%	M	15	4.5
9	Production problems may interrupt developers working on this project.	Anytime	M	30%	M	10	3
10	Other new projects may take away resources.	Anytime	H	70%	H	45	31.5
Total EMV							79.75

Risk Contingency Reserve

- What is Risk Contingency Reserve?
- Using Risk Contingency Reserve
- Communicating Risk Contingency Reserve
- Limitations of Risk Contingency Reserve

RefineM PROJECT MANAGEMENT CONSULTING

What is Risk Contingency Reserve?

* Time or cost set aside to manage *identified* risks

* Contingency Reserve covers "known unknowns"

* Benefits of Contingency Reserve
  - ✓ Improves predictability of outcomes
  - ✓ Effective communication tool for risks

* Can be found by summing EMV for risks
  - ✓ Days and dollars

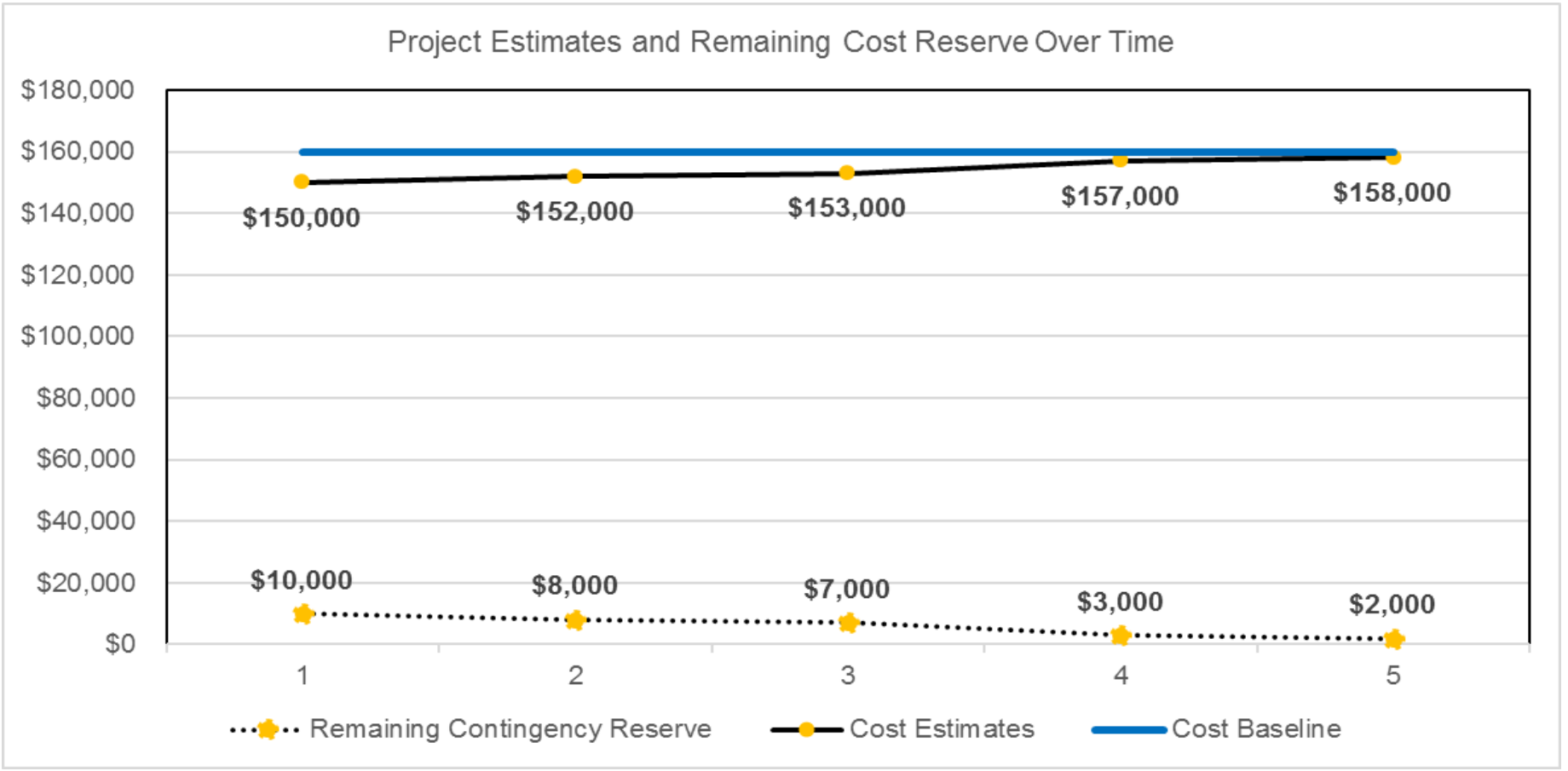
Using the Reserve

* When risk occurs:
  - ✓ Actual impact is added to cost/schedule
  - ✓ Estimated budget/schedule is updated
  - ✓ Contingency reserve decreases
  - ✓ Baseline is NOT updated

If risk does not occur, contingency not spent

Project finishes before time, under budget

Using Risk Contingency Reserve



RefineM
Contact@RefineM.com
www.RefineM.com

Communicating Schedule

- Schedule baseline = Estimated finish date + contingency reserve (time/schedule aspect)
  - ✓ Example: Estimated Finish date is in 10 weeks, with contingency reserve of 4 weeks. What is the schedule baseline?
    - Schedule Baseline is 14 weeks.

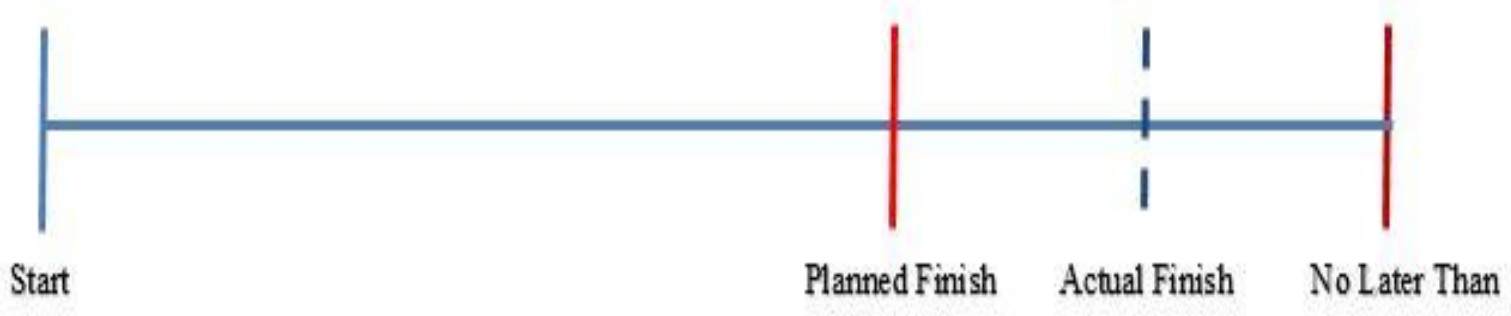
“No Later Than” date

Communicating Cost

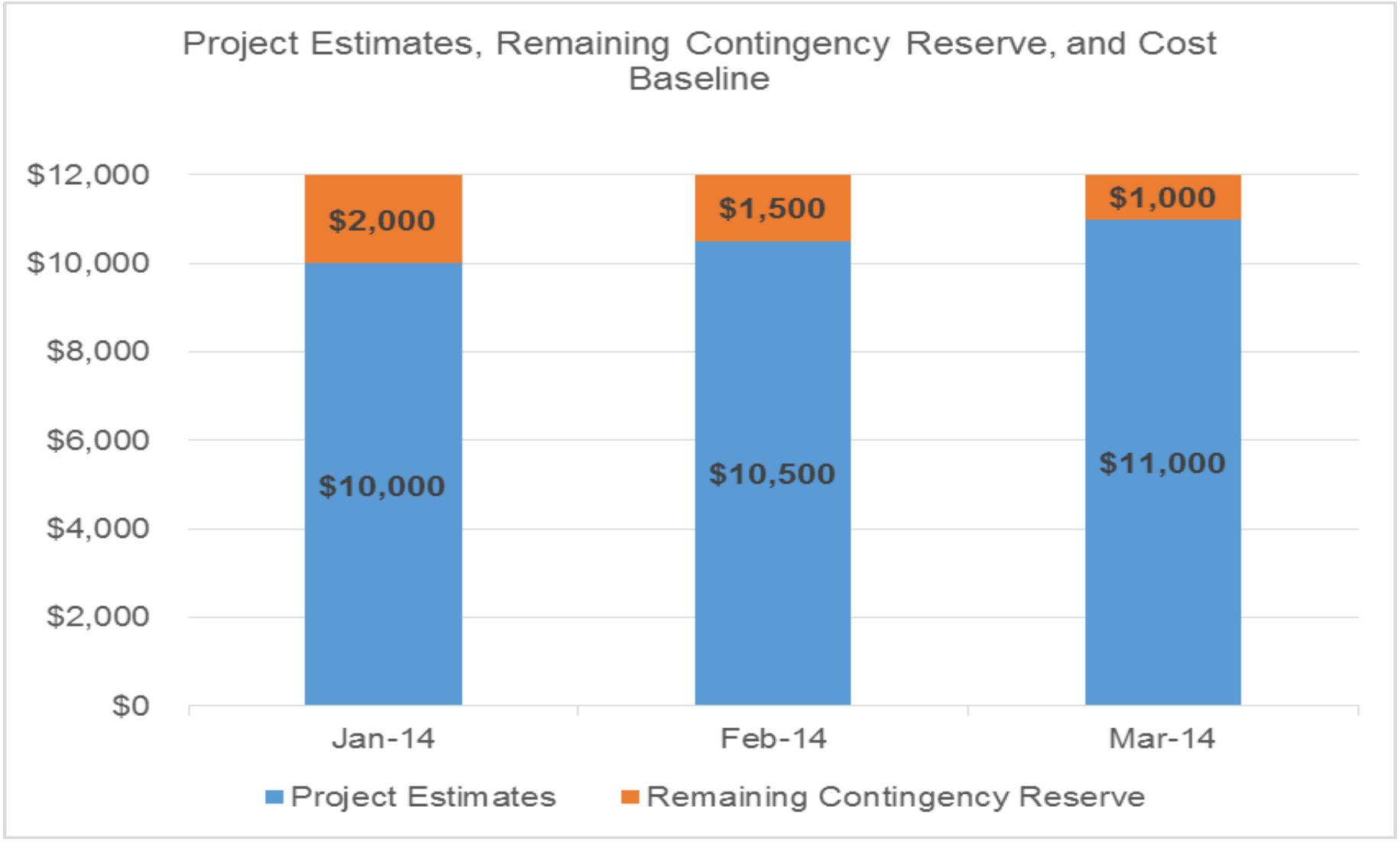
- Cost baseline = Estimated costs + contingency reserve
  - ✓ Example: Project budget is $1,000,000, contingency reserve is $250,000. What is the cost baseline?
    - Cost baseline is $1,250,000.

“Not to Exceed” budget

Project Finish



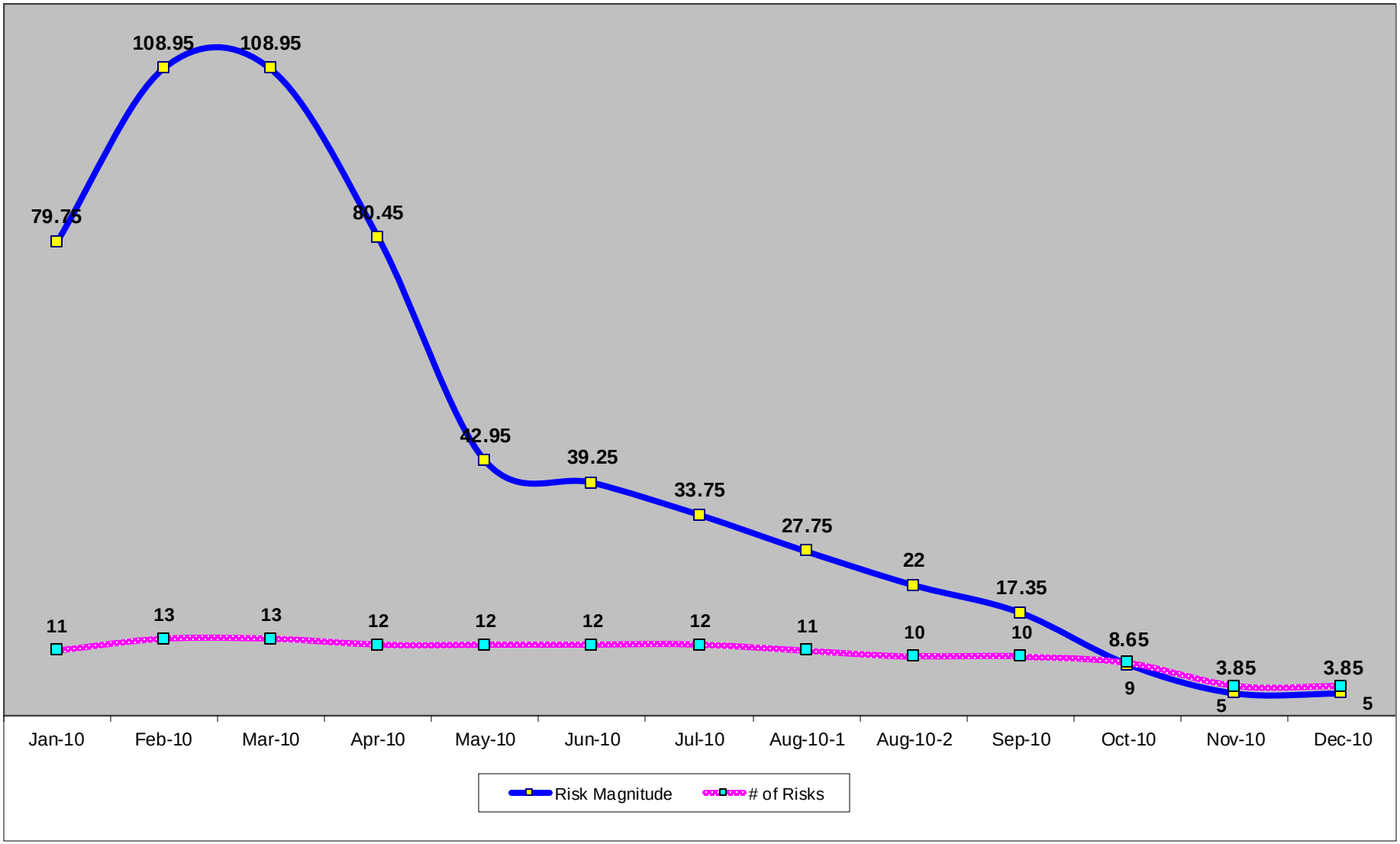
Cost Baseline



Risks With EMV

ID	Risk Description	Event Date	Probability		Impact (Days)		EMV
1	Performance issues are not addressed before testing, causing delays.	Sep-14	H	70%	M	15	10.5
2	Server performance issues may occur during testing, causing delays.	Aug-14	L	10%	M	10	1
3	Unanticipated changes occur after code complete, causing rework.	Aug-14	L	10%	L	5	0.5
4	Testing environment may interfere with other high-priority projects, causing conflicts.	Jul-14	L	10%	M	10	1
5	Implementation priority may change, causing massive delays.	Jul-14	M	25%	H	40	10
6	Impact analysis may cause additional change requests.	Jul-14	M	25%	M	15	3.75
7	Code Complete may be delayed due to developer resource allocation to other projects.	Jun-14	H	50%	M	20	10
8	Testing may be delayed due to differences in rating between two systems.	May-14	M	30%	M	15	4.5
9	Production problems may interrupt developers working on this project.	Anytime	M	30%	M	10	3
10	Other new projects may take away resources.	Anytime	H	70%	H	45	31.5
Total EMV							79.75

Magnitude Over Time



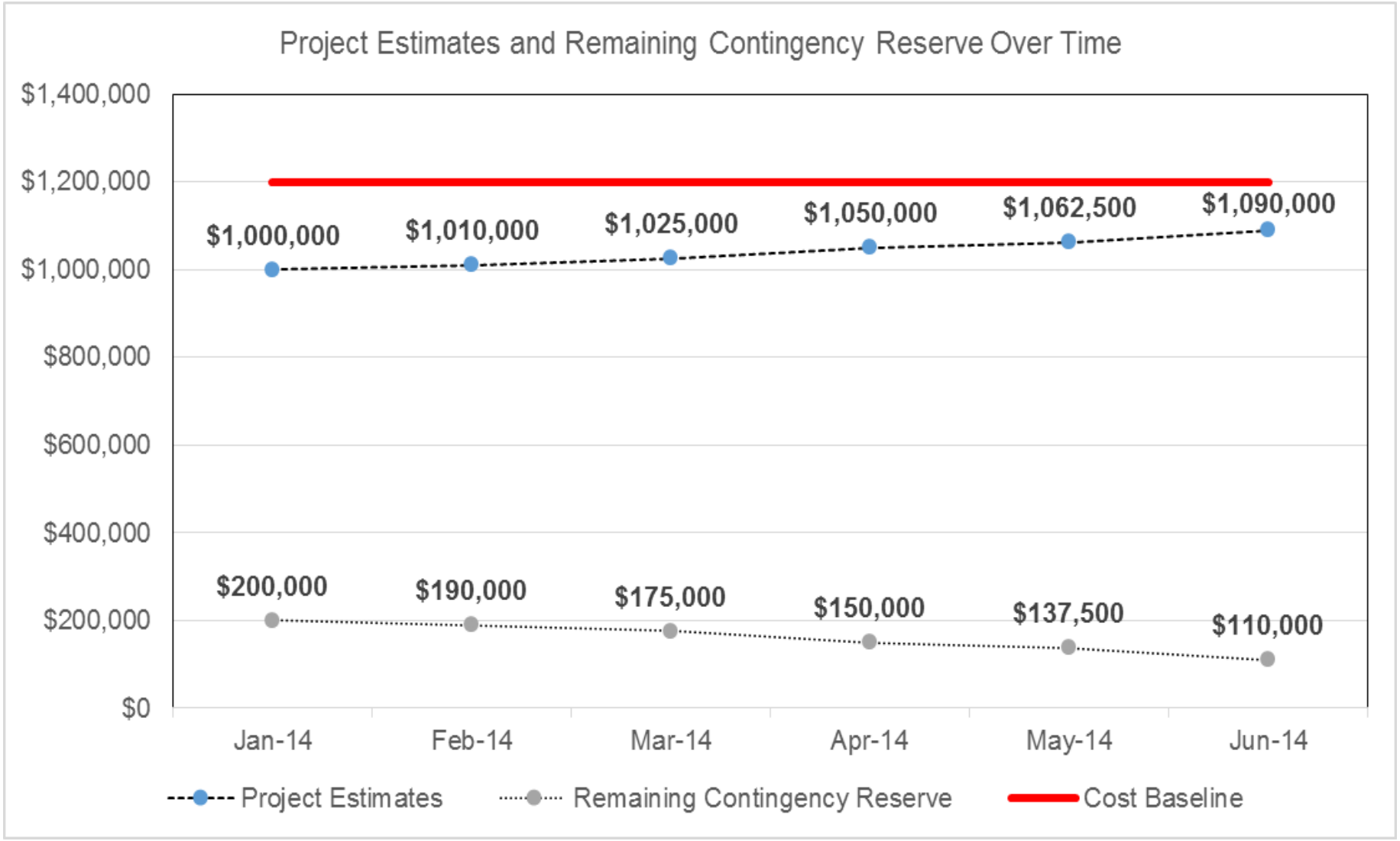
Risk Duration

ID	Task Name	Duration	% Complet	Start	Finish
1	SBR for 1st State (IOWA) - with Risks	73.85 wks	37%	Mon 8/3/09	Wed 1/19/11
2	Risk Reserve for Unmitigated Risks	39.25 days	0%	Fri 11/19/10	Wed 1/19/11
3	Project Tasks	66 wks	41%	Mon 8/3/09	Thu 11/18/10
4					
5	SBR in Production - 1st State (IOWA)	66 wks	55%	Mon 8/3/09	Thu 11/18/10
6	Identify the first state - IOWA	0 days	100%	Fri 11/6/09	Fri 11/6/09
7	Mainframe Tasks Group0	11.8 wks	100%	Wed 11/4/09	Mon 2/1/10
13					
14	Mainframe Tasks Group1	19 wks	99%	Mon 1/18/10	Fri 5/28/10
49					
50	Mainframe Tasks Group2	19.2 wks	75%	Mon 2/8/10	Tue 6/22/10
74					
75	Mainframe Tasks Group3	12.6 wks	67%	Wed 3/24/10	Mon 6/21/10
97					
98	Mainframe Tasks Group4	20.8 wks	59%	Fri 1/22/10	Thu 6/17/10
134					
135	Mainframe Tasks Group5	4.6 wks	15%	Mon 5/10/10	Thu 6/10/10
141					
142	PARIS/PC Tasks	39.8 wks	65%	Thu 10/15/09	Thu 7/29/10
167					
168	Rating Related Tasks	43 wks	61%	Mon 8/3/09	Tue 6/8/10
185					
186	HSM for IOWA	0 wks	0%	Fri 8/6/10	Fri 8/6/10
187					
188	Testing	19.2 wks	0%	Wed 6/23/10	Fri 11/5/10
200					
201	Initial Implementation	15 wks	0%	Thu 8/5/10	Thu 11/18/10

Charting Estimates

- Show periodic expenditure for each risk that occurs
  - ✓ Month-wise or otherwise
- For each risk:
  - ✓ Remaining contingency reserve goes down
  - ✓ Cost / Schedule Estimate goes up
  - ✓ Cost Baseline remains the same

Estimates Over Time



Limitations of the Model

* This Model is NOT as useful when:
  - ✓ Only few risks have been identified
  - ✓ All risks have high probability

Either of these could produce erroneous results

Too Few Risks

* If risks are too few, “insurance pool” not large enough
  - ✓ Need to find more risks
  - ✓ Consider a Risk Breakdown Structure (RBS)

RBS Level 0	RBS Level 1	RBS Level 2
ALL SOURCES OF PROJECT RISK	1. TECHNICAL RISK	1.1 Scope Definition
		1.2 Requirement Definition
		1.3 Estimates, Assumptions, and constraints
		1.4 Technical processes
		1.5 Technology
		1.6 Technical Interfaces
		Etc.
	2. MANAGEMENT RISK	2.1 Project Management
		2.2 Program/Portfolio Management
		2.3 Operations Management
		2.4 Organization
		2.5 Resourcing
		2.6 Communication
		Etc.
	3. COMMERCIAL RISK	3.1 Contractual terms and conditions
		3.2 Internal Procurement
		3.3 Suppliers and vendors
		3.4 Subcontracts
		3.5 Client/Customer Stability
		3.6 Partnership and joint ventures
		Etc.
	4. EXTERNAL RISK	4.1 Legislation
		4.2 Exchange rates
		4.3 Sites/Facilities
		4.4 Environmental/weather
		4.5 Competition
		4.6 Regulatory
		Etc.

Too High Probability

* Look into strategies other than risk contingency reserve
  - ✓ Avoid
  - ✓ Mitigate
  - ✓ Transfer
  - ✓ Accept

Risk Metrics

- What Are Risk Metrics?
- Why Use Risk Metrics?
- Risk Contingency Reserve Ratio
- Risk Contingency Reserve Ratio Exercise

RefineM PROJECT MANAGEMENT CONSULTING

What Are Risk Metrics?

- Measure of risk exposure of a project, program, or portfolio
  - ✓ i.e. “How risky is this project”?
- Key metric: ratio of contingency reserve / initial baseline
- Other risk metrics include:
  - ✓ Number of risks identified
  - ✓ Number of risks realized
  - ✓ Total risk contingency reserve

Source: Project Management Institute (2013). *Guide to the Project Management Body of Knowledge (PMBOK® Guide),* Fifth Edition. Newtown Square, PA: Project Management Institute.

Why Use Risk Metrics?

- Risk measurement can be a part of benefits analysis
  - ✓ Project may be worthwhile, but will it succeed?

- Negative risks (threats) can cause a project to derail
  - ✓ Delays
  - ✓ Cost overruns
  - ✓ Other catastrophes

- Positive risks (opportunities) also need to be accounted for
  - ✓ Ways to finish faster
  - ✓ Cost savings
  - ✓ Other windfalls

Can you think of other reasons?

Risk Contingency Reserve Ratio

* Ratio of risk contingency reserve to initial baseline

* **Example:**
  - ✓ On Project X, the risk contingency reserve is $50,000.
  - ✓ The initial baseline of Project X is $150,000.
  - ✓ What is the ratio of contingency reserve to the initial baseline?
  - ✓ Based on the ratio, how risky do you think the project is?
  - ✓ **$50,000 / $150,000 = 33%**
  - ✓ **33% is very risky**

Risk Contingency Reserve (CR) Ratio Exercise

Project	Initial Baseline	Contingency Reserve ($)	Contingency Reserve Ratio (%)
1	$30,000	$10,000	?
2	$240,000	$60,000	?
3	$375,000	$75,000	?
4	$300,000	$50,000	?
5	$1,000,000	$400,000	?

Which projects have the most risk?

Conclusion

- Risk contingency reserve helps improve predictability
  - ✓ Stakeholders can see the difference between plan and actual
  - ✓ Size of risk contingency reserve measures how risky project is
- EMV is a good advanced risk technique to get started
  - ✓ Doesn't take a whole lot of time and money to implement
  - ✓ Helps get the team communicating about risk

Guide your team through difficult projects with advanced risk management techniques

Next Online Training Course

Advanced Techniques in Stakeholder Management
Tuesday, July 12, 9:00 AM-1:00 PM CT

$250 regular registration

Take your stakeholder management to the next level.

More info at https://refinem.com/training/advanced-techniques-in-stakeholder-management/
Contact us at Contact@RefineM.com

Featured Upcoming In-Person Training

Project Management Professional (PMP)® Exam Prep

Course Details:	Register:
When: Multiple Dates	*Aug 01-04, Springfield, MO
Where: Multiple Cities	*Aug 08-11, Kansas City, MO
Format: 4-day, in-person training	Oct 10-13, Atlanta, GA
Fee: $1,595 until 3 weeks before course start date, $1,800 afterwards *Food and course materials included with fee. Other discounts available.*	Oct 24-27, Raleigh, NC
Earn: 35 PDUs / Contact Hours	*Oct 31-Nov 3, Springfield, MO
	*Dec 05-08, Kansas City, MO
	*Feb 06-09, Springfield, MO
	*Feb 13-16, Kansas City, MO
	*May 01-04, Springfield, MO
	*May 08-11, Kansas City, MO
	Contact us about future dates or to arrange for this training to be delivered in your organization or city.

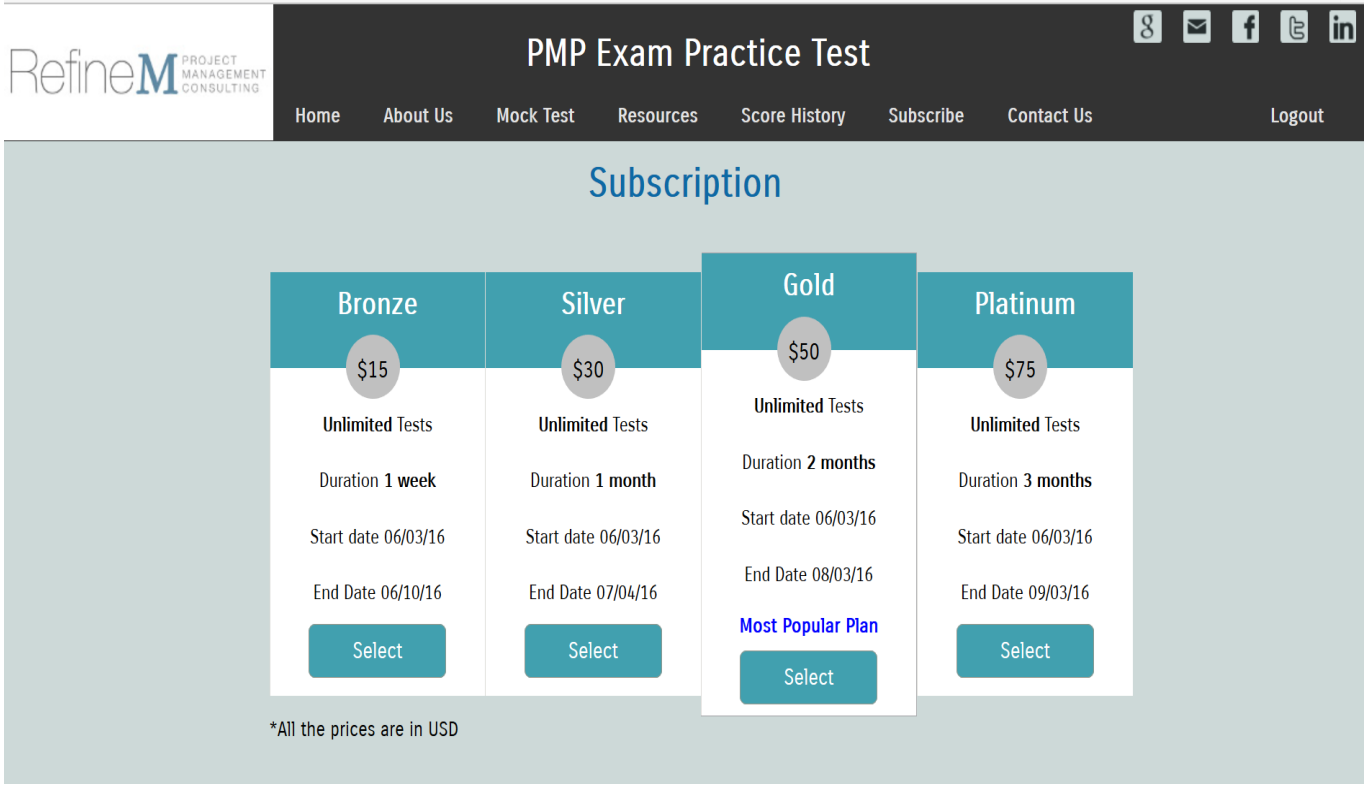
Prepare to earn your PMP® certification with RefineM.

More info at https://refinem.com/training/pmp-exam-prep-course

Contact us at Contact@RefineM.com

Introducing our PMP Exam Prep Site

More details at https://examprep.refinem.com



Next Lunch and Learn

* ***Advanced Leadership Skills Overview***
  - ✓ How do you become an effective project leader?
  - ✓ What are the key leadership skills you need to master?
* ***Wednesday, August 3, 12:00-1:00 PM Central***

Register Today - Don't wait for the last Minute

How to Claim 1 PDU for this Webinar?

1. **Visit** ccrs.pmi.org and log in.
2. **Click** on "Report PDUs" link.
3. **Click** "Courses and Training" in upper left.
4. **Activity Name:** "Advanced Risk Management Techniques"
   (complete this first, before you go to #5)
5. **Provider:** "RefineM LLC" *(don't select dropdowns)*
6. **Date started:** July 6, 2016
7. **Date completed:** July 6, 2016
8. **Contact person:** NK Shrivastava
9. **Contact phone:** (417) 763-6762
10. **Contact email:** Trainings@RefineM.com
11. **PDUs:** 1.00 Technical.
12. **Click** on the "I agree this claim is accurate" box and then Submit.

Rewarding Our Star Attendees

* Anyone who attends 3 Lunch and Learn Webinars in a row is a Star Attendee and is eligible for a prize drawing for a $10 Amazon gift card.

This month's Star Attendees are:

- Kathryn W.
- Liz B.
- Tim A.

The winner is:

Kathryn W.!

Congratulations to the winner!

Stay tuned for our next drawing in August.

Attendee Questions

1. How to quantify risk into time (number of days in schedule)?
2. Are project errors such as missed deadlines a risk or just bad PM?
3. How do you manage risk in a competitive environment where you can't charge a contingency reserve?
4. How do you know when to stop identifying risk or how to choose the right amount of risk to truly spend time on effectively?
5. How do you start the risk discussion for new projects?

Questions?

RefineM PROJECT MANAGEMENT CONSULTING

NK Shrivastava, MBA, PMP, RMP, ACP, CSP, SPC4

CEO/Consultant, RefineM

Nixa, MO 65714, USA

nks@refinem.com, www.refinem.com

http://www.linkedin.com/in/nkshrivastava

justrightpm

More Training Opportunities From RefineM

Training Title	Springfield	Kansas City	St. Louis	Instructor-Led Online
Advanced Techniques in Stakeholder Management				Jul 12*
PMP® Exam Prep	Aug 1-4*	Aug 8-11*		
Advanced Techniques in MS Project				Aug 18
Project Management Fundamentals	Aug 19*			
Is Quality Really Important?	Aug 19			
Agile Fundamentals / Agile 101		Aug 24-25*	Oct 20-21	
PMI-ACP® Exam Prep		Aug 24-26*		
Leadership Skills for Successful Teams	Aug 24			
Lean 101	Aug 26			
Leadership Skills to Drive Results	Aug 31*			
Change Management	Sept 01			
Adv. Techniques in Risk Management				Sept 15*
Leadership Skills for Project Managers		Oct 06*	Nov 16	
Risk Management for Projects		Nov 14		

Courses with red asterisk are guaranteed to run.

Please visit https://refinem.com/training/ for more details.