

ICP

IDAHO CLEANUP PROJECT

Project Risk Management Tutorial

Presented to:

Eastern Idaho Chapter – Project Management Institute

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Contract and Technical Integration

CH2M•WG

IDAHO, LLC

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SAFELY PLAN • MOTIVATE • DELIVER

Project Risk Definition



"An uncertain event or condition that, if it occurs, has a positive or a negative effect on at least one project objective such as scope, time, cost or quality."

1 *A guide to the Project Management Body of Knowledge, 3rd edition, 2004*

Project Risk Management Processes



- ◆ **Risk Management Planning** – determining how to approach, plan, and execute the risk management activities for a project.
- ◆ **Risk Identification** – determining which risks might affect the project and document their characteristics.
- ◆ **Qualitative Risk Analysis** – prioritizing risks for subsequent further analysis or action by assessing and combining their probability of occurrence and impact.
- ◆ **Quantitative Risk Analysis** – numerically analyzing the effect on overall project objectives of identified risks.
- ◆ **Risk Response Planning** – developing options and actions to enhance opportunities, and to reduce threats to project objectives.
- ◆ **Risk Monitoring and Control** – tracking identified risks, monitoring residual risks, identifying new risks, executing risk response plans, and evaluating their effectiveness throughout the project life cycle.

Project Risk Management Overview



Risk Management Planning	Risk Identification	Qualitative Risk Analysis
1. Inputs <ul style="list-style-type: none"> a. Enterprise environmental factors b. Organizational process assets c. Project scope statement d. Project management plan 2. Tools and Techniques <ul style="list-style-type: none"> a. Planning meetings and analysis 3. Outputs <ul style="list-style-type: none"> a. Risk Management Plan 	1. Inputs <ul style="list-style-type: none"> a. Enterprise environmental factors b. Organizational process assets c. Project scope statement d. Risk management plan e. Project management plan 2. Tools and Techniques <ul style="list-style-type: none"> a. Documentation reviews b. Information gathering techniques c. Checklist analysis d. Assumptions analysis e. Diagramming techniques 3. Outputs <ul style="list-style-type: none"> a. Risk register 	1. Inputs <ul style="list-style-type: none"> a. Organizational process assets b. Project scope statement c. Risk management plan d. Risk register 2. Tools and Techniques <ul style="list-style-type: none"> a. Risk probability and impact assessment b. Probability and impact matrix c. Risk data quality assessment d. Risk categorization e. Risk urgency assessment 3. Outputs <ul style="list-style-type: none"> a. Risk register (updates)

Project Risk Management Overview (cont'd)

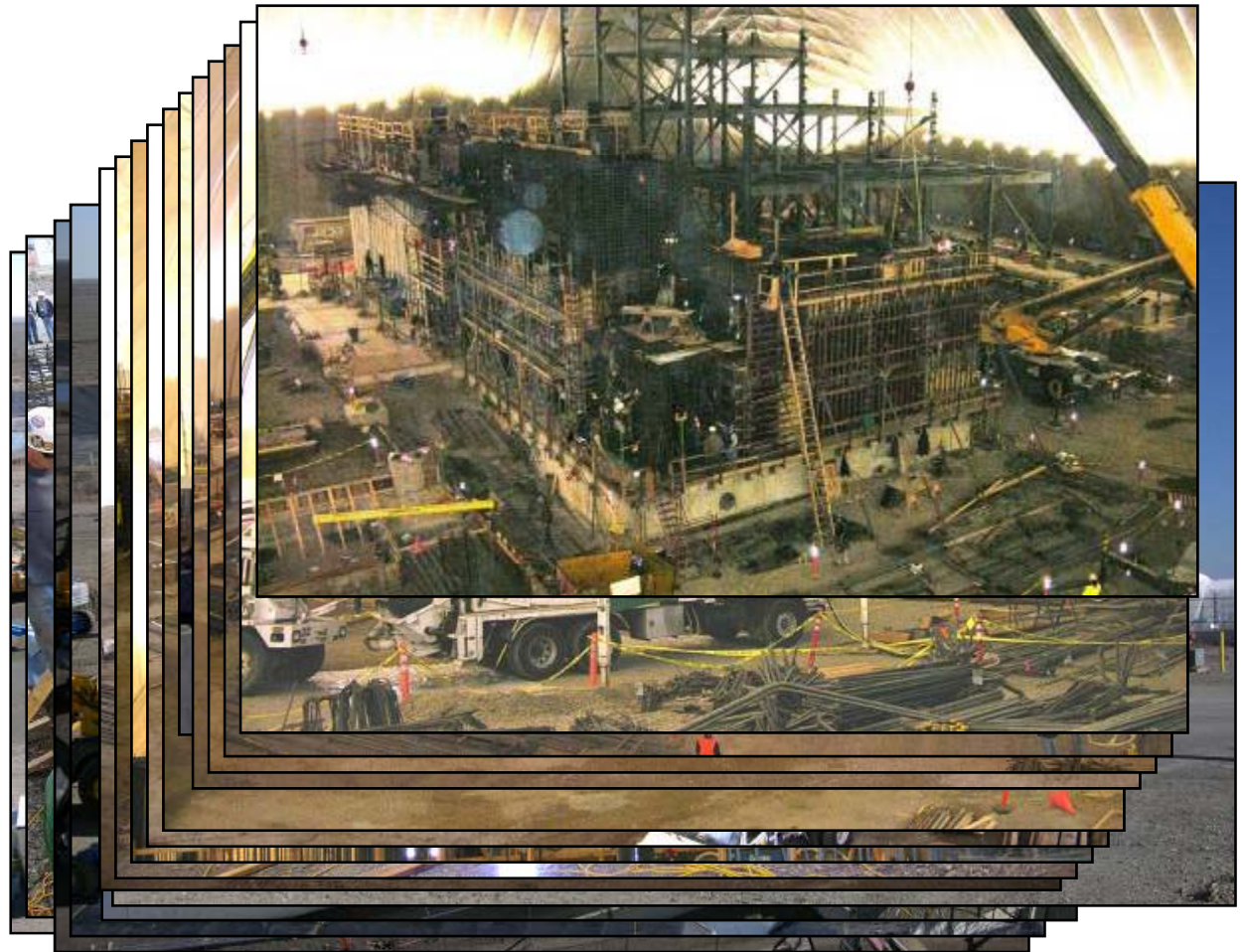


Quantitative Risk Analysis	Risk Response Planning	Risk Monitoring and Control
1. Inputs <ol style="list-style-type: none"> Organizational process assets Project scope statement Risk management plan Risk register Project Management Plan 2. Tools and Techniques <ol style="list-style-type: none"> Data gathering and representation techniques Quantitative risk analysis and modeling techniques 3. Outputs <ol style="list-style-type: none"> Risk register (updates) 	1. Inputs <ol style="list-style-type: none"> Risk management plan Risk register 2. Tools and Techniques <ol style="list-style-type: none"> Strategies for negative risk or threats Strategies for positive risks or opportunities Strategy for both threats and opportunities Contingency response strategy 3. Outputs <ol style="list-style-type: none"> Risk register (updates) Project management plan (updates) Risk-related contractual agreements 	1. Inputs <ol style="list-style-type: none"> Risk management plan Risk register Approved change requests Work performance information Performance reports 2. Tools and Techniques <ol style="list-style-type: none"> Risk assessments Risk audits Variance and trend analysis Technical performance measurement Reserve analysis Status meetings 3. Outputs <ol style="list-style-type: none"> Risk register (updates) Requested changes Recommended corrective actions Recommended preventive actions Organizational process assets (updates) Project management plan (updates)

Idaho Cleanup Project



- ◆ Cost-Plus-Incentive-Fee Contact
- ◆ May 1, 2005 – September 30, 2012
- ◆ \$2.381 billion Lifecycle Target Cost
- ◆ Cost and Schedule Incentives
- ◆ End-state Scope Definition at
 - Idaho Nuclear Technology and Engineering Center
 - Radioactive Waste Management Complex
 - Test Area North
 - Test Reactor Area
 - Power Burst Facility
 - Miscellaneous Sites



October 12th, 2007

**Test Area North (TAN)
Hot Shop**

**Scheduled demolition
as part of INL cleanup**

00:50 TRT

ETR
Bioshield Detonation
North side Detonation
June 22, 2007
Camera Angle:
Northeast Corner

Sources of Risk



- ◆ **Funding**
 - Lifecycle target
 - Federal annual budget
- ◆ **Design complexities**
 - Integrated Waste Treatment Unit
- ◆ **New technology or new application**
- ◆ **Regulatory**
 - Settlement Agreement
- ◆ **Offsite shipments/receiver sites**
 - Waste Isolation Pilot Plant Acceptance
 - Nevada Test Site Acceptance deadline
- ◆ **Resource limitations**
 - Market conditions (concrete, steel)
- ◆ **Numerous project assumptions**

Risk Management Planning



- ◆ Planning commensurate with the level and type of risks
- ◆ Completed early during project planning
- ◆ Project manager, selected project team members, risk management experts and other stakeholders develop the risk management plan
- ◆ Risk Management Plan describes how risk management will be structured and performed on the project (subset of the PMP)
 - Methodology
 - Roles and responsibilities
 - Categorization (e.g., risk breakdown structure or listing)
 - Define risk probability and impact
 - ◆ Probability – narrative (“likely”) or numerical (1-5)
 - ◆ Impact – narrative (“high”) or numerical (1-5 or nonlinear)

Risk Identification



- ◆ Typical participants in the identification process include the project manager, project team members, risk management experts, subject matter experts (SMEs) outside of the project, stakeholders and customers
- ◆ Initially performed during development of project plan
- ◆ Iterative process – performed throughout the project lifecycle
- ◆ Outputs usually categorized and maintained in a document called a “risk register”
 - Listing of identified risks and causes
 - Potential responses

Risk Identification (cont'd)



Some identification techniques

- ◆ Information gathered from previous projects
- ◆ Project scope statements and assumptions therein
- ◆ Interviews
 - Usually main source of risk identification
 - Interview project team, other SMEs, customers and other stakeholders
- ◆ Brainstorming
 - Usually led by a facilitator with project team and other experts
- ◆ Delphi
 - Used to reach a consensus among experts
 - Anonymous
 - Questionnaire is used to solicit ideas about important project risks
 - Experts comment and consensus is eventually reached

Qualitative Risk Analysis



- ◆ **Prioritize the identified risks for further action**
 - Likelihood that risk will occur (probability)
 - Potential effect on project objectives (impact)
- ◆ **Assessed through interviews and meetings led by a facilitator (typical) with knowledgeable persons**
- ◆ **Probability and impact matrix developed**
- ◆ **Risk classification and categorization enables project manager to**
 - Focus attention on risks with high significance
 - Look for common causes
 - Create watch lists for low priority risks

Qualitative Risk Analysis (cont'd)



- ◆ Probability and impact matrix reveals project risk classification
- ◆ Risk “score” helps guide risk response

Probability of Risk Materializing	Very Likely	MEDIUM	MEDIUM	HIGH	HIGH	HIGH
	Likely	LOW	MEDIUM	HIGH	HIGH	HIGH
	Unlikely	LOW	LOW	MEDIUM	MEDIUM	HIGH
	Very Unlikely	LOW	LOW	LOW	LOW	MEDIUM
		Severity of Consequence				
		Negligible	Marginal	Significant	Critical	Crisis

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Quantitative Risk Analysis



- ◆ Performed on risks that have been prioritized by the qualitative risk analysis process as potentially and substantially impacting the project
- ◆ A numerical rating assigned to those risks
- ◆ Techniques used include modeling simulation (e.g., Monte Carlo technique) and decision tree analysis (use of a decision tree diagram)
- ◆ Outputs of analysis include
 - Probability of achieving cost and schedule objectives
 - Prioritized list of quantified risks

Process Gas Filter Cone



Risk Response Planning



- ◆ Process to develop options and determine actions to enhance opportunities and reduce threats
- ◆ One or more people are identified to take responsibility for each risk response (“risk response owner”)
- ◆ For negative risks, typically three strategies employed
 - Avoid – eliminate the threat posed by an adverse risk (e.g., extend a schedule or reduce the scope)
 - Transfer – transfer the risk to a third party (e.g., insurance)
 - Mitigate – reduce probability or impact of risk (e.g., prototype development)

Typical Risk Response Plan



I. General Information

- a. Risk event title
- b. Unique risk event identification number
- c. Responsible person

II. Collective Risk Data

- a. Risk score
- b. Probability of occurrence
- c. Risk Trigger
- d. Impact score
- e. Scoring date
- f. Description of the effect the risk would have on the project

III. Risk Mitigation Strategy

- a. Strategy Description
- b. Specific Action Plan
 - i. Action
 - ii. Responsible party
 - iii. Completion date
 - iv. Status
- c. New risks interjected by the plan
- d. "Go/No Go" decision dates/description
- e. Approvals
 - i. Preparer
 - ii. Manager
 - iii. Project manger

Risk Monitoring and Control



- ◆ Project risk must be continuously monitored throughout the life of the project
- ◆ The project manager must
 - Receive regular briefings from risk response owners
 - Monitor contingency and workaround plans
 - Reassess project risks regularly

Closing Thoughts



- ◆ Projects will *always* have risks
- ◆ If you do not manage project risks *they will manage you*
- ◆ Companies value project managers who are risk-takers, not gamblers
(The distinction is the understanding and managing of project risk)