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Risk Workshop Overview

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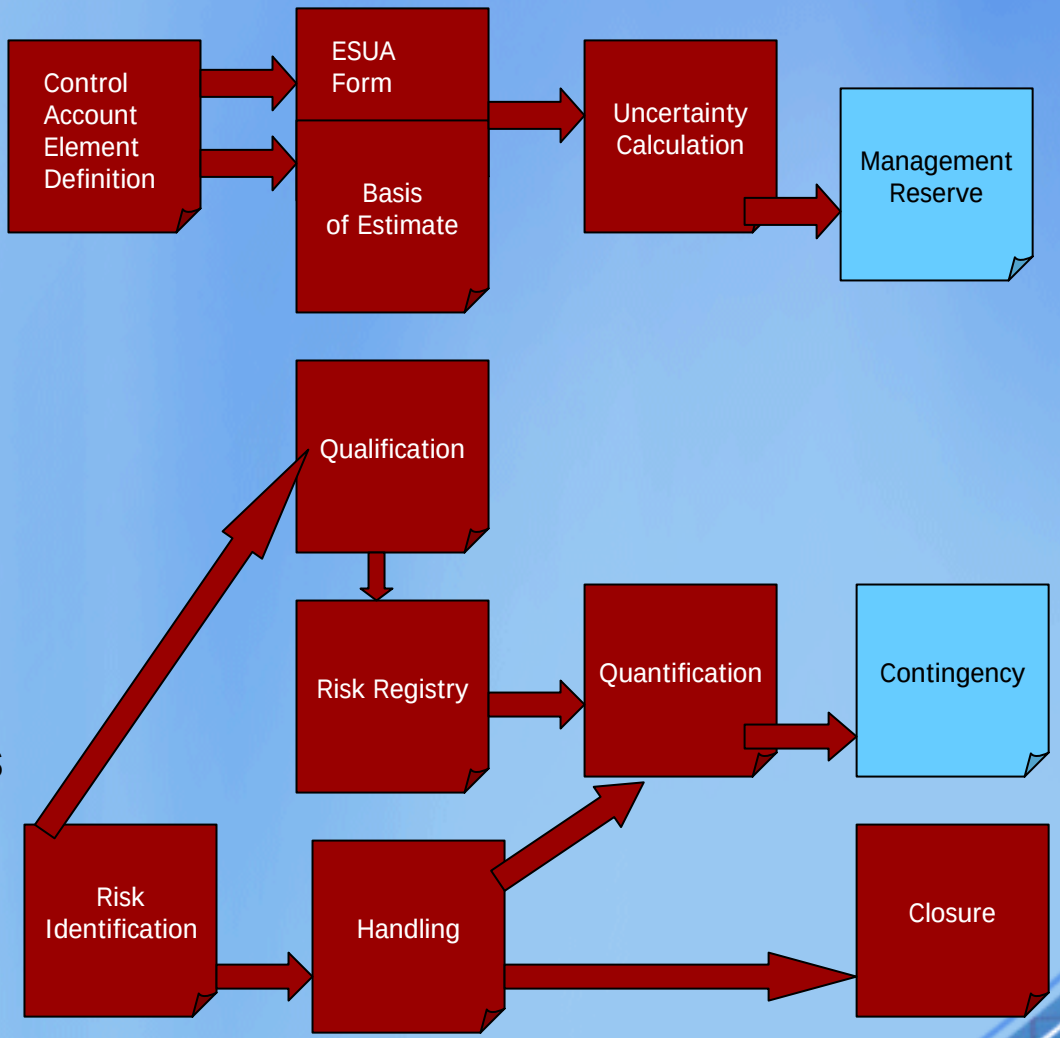
RISK MANAGEMENT PROGRAM SUMMARY

CONTENTS:

1. Overview
2. ESUA
3. TPRA
4. Risk Item Identification and Management Process



MFFF Risk Program

Three Related Programs

1. Estimate and Schedule Uncertainty Analysis - documents the project planners' and estimators' degree of uncertainty with the estimate and schedule. This report also establishes a recommendation for Management Reserve at the 85% confidence level for the MOX Project Manager to mitigate cost and schedule issues during project execution that could not be precisely defined during the planning and estimated phase.

2. Technical and Programmatic Risk Analysis - evaluates potential project risks (both cost and schedule), factoring in the likelihood and consequence of each potential risk event, and suggests a contingency budget at the 85% confidence level.

3. Risk Management - manages identified Risk Events throughout the project lifecycle so that there is a minimal and acceptable impact on the cost, schedule, construction, engineering, and operational performance.

Management Reserve and T&PRA Contingency

DCS Management Reserve for Estimate/Schedule Uncertainty

Impacts due to Uncertainties in Estimating/Scheduling Defined Work Scope

Evaluation of uncertain issues effect on **Integrated Project Schedule (IPS)** & **Option 1 Contract Budget Base (CBB) Estimate**

Monte Carlo analysis of cumulative **Cost Impact to CBB**

Monte Carlo analysis of cumulative **Schedule Impact to IPS**

Uncertainty Impacts added to **CBB Estimate** and **IPS** to achieve 85% LOC in **CBB/IPS**

DOE Contingency Allowance for Technical & Programmatic Risk Analysis (T&PRA)

Impacts due to Potential Discrete Risk Events

Evaluation of discrete risk events to **determine individual Cost and Schedule Impact**

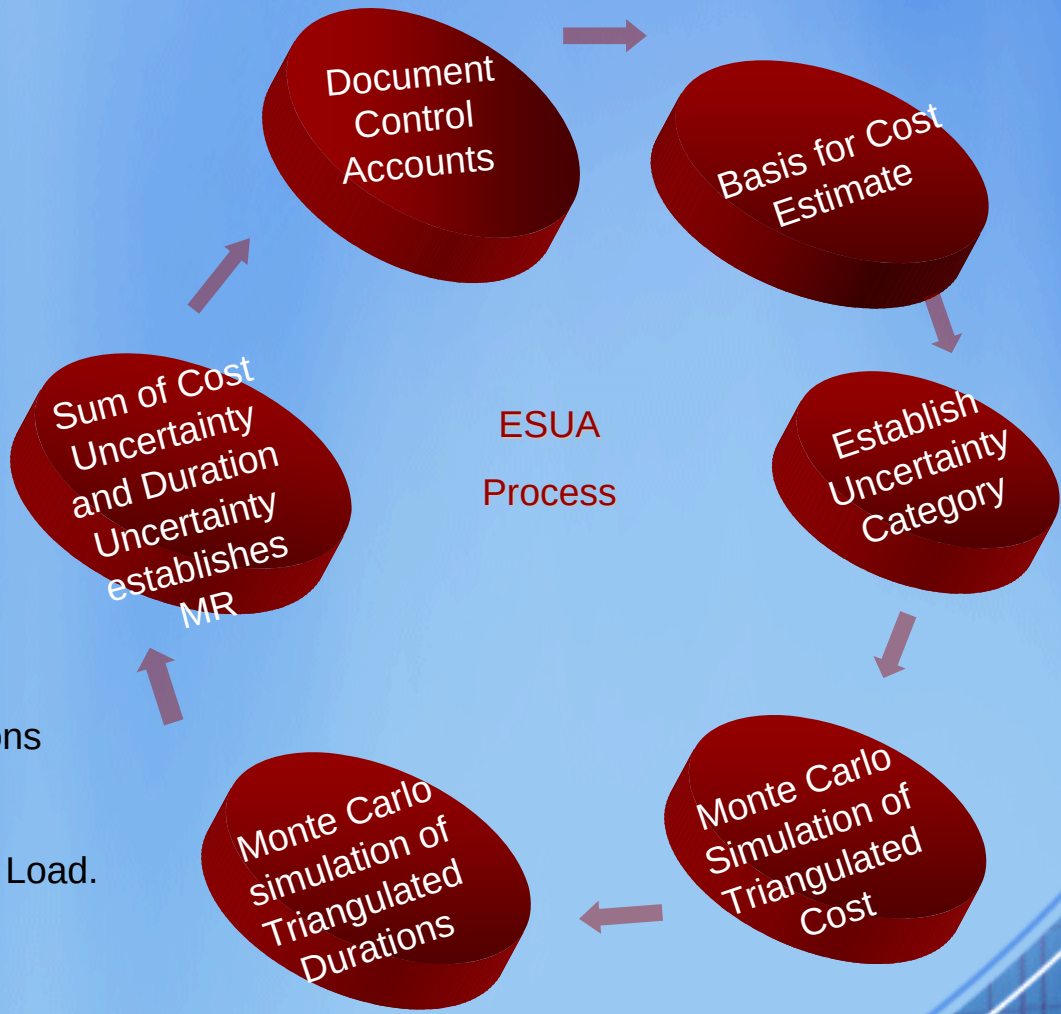
Monte Carlo analysis of cumulative **Cost impact to Total Project Costs (TPC)**

Monte Carlo analysis of cumulative **Schedule Impact to IPS**

Recommendation to DOE on **T&PRA Contingency Allowance** to achieve 85% LOC in **TPC / IPS**

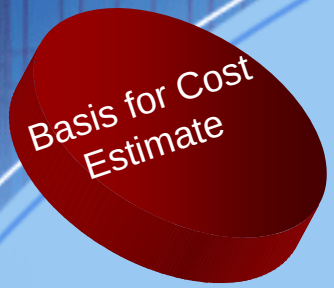
Estimate and Schedule Uncertainty Analysis

- Control Accounts Created for WBS
  - Element Definitions
  - BOEs
- Uncertainty Categories Assigned
  - Justification Forms with BOEs
  - Standard Ranges
- Monte Carlo Cost Simulation
  - Converge at 85% Confidence
  - Record Cost Uncertainty
- Monte Carlo Simulation on Schedule Durations
  - Converge at 85%
  - Convert Duration Uncertainty to Hotel Load.
- Sum Cost Uncertainty and Hotel Load
  - Sum equals MR Recommendation



Document Control Accounts

- Control Account Managers create the Element Definitions for the Control Account's Scope of Work.
- Control Accounts may be further detailed to Work Packages if detail is required to clarify levels of uncertainty.



- The Estimate of Cost and Duration is based on Historical Data, Documented Experience, Parametric Calculations, or Vendor Quotes.
- Estimates must be well documented with assumptions to support validations.
- Basis-of-Estimates are attached to the Element Definitions of Scope and are part of the controlled Baseline.

Establish Uncertainty Category

- Control Account Managers are responsible for establishing the Uncertainty Category for each Control Account or Work Package.
- Each Control Account is identified as a Definitive (D), Budget (B) or Conceptual (C) estimate. In some cases the uncertainty category may be assigned an “X” classification to allow the CAM to expand the range based on Vendor or supplier data.

Monte Carlo Simulation of Triangulated Cost

- The Uncertainty Data from the Control Account ESUA Forms is analyzed in a Monte Carlo Simulation. Each Estimate categorized for its uncertainty is represented by a triangulated range and calculated to an 85% Confidence level.

- Uncertainty ranges input to the Simulation software are

(D) Definitive	-5% to + 15%
(B) Budget	-15% to + 30%
(C) Conceptual	-30% to + 50%
(X) User Defined	(Range based on Vendor Quotes)

Monte Carlo simulation of Triangulated Durations

- The Schedule Monte Carlo analysis is loaded in PertMaster from the ESUA database.
- The uncertainties and the associated consequences are logically tied to the baseline activities creating a PertMaster modified model of the Project Schedule.
- The schedule slip is used to calculate the proposed MR for Schedule ESUA

To establish the overall recommendation for MR value, the @Risk Monte Carlo Cost Value and the PertMaster Monte Carlo 85 % Level of Confidence Schedule Value are summed.

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TPRA Analysis using the PertMaster
RISK MANAGEMENT PROCESS

- Schedule Review
  - Risk Ready State
  - Review for logic & errors
- Risk Identification
  - Estimate Uncertainty
  - Risk Events: Risk Register
- Develop Preliminary Risk Model
  - Enter Estimate Uncertainty
  - Map Risks to Activities
- Preliminary Analysis & Review
  - Impacted Risk Plan
  - Monte Carlo simulation
- Final Model & Report
  - Risk Event plan
  - Response planning

Based on: PMBOK Chapter 11

Schedule Check

- Checks for Schedule Best Practices
- Remember..."Not Everything has to be Perfect"
- Don't delete Problem Activities...Defeats the Purpose!

Pre-Analysis Check

- Not all Schedule Issues will be identified by Schedule Check
- The Pre-Analysis Run will check Duration, Criticality and Relative Duration to Project

Estimate Uncertainties

- Identify “Risky” Areas of the Project
- Focus on the Critical Path and High Risk Activities.
- Decide if risk is based on Project Phase, Area of Work, Contractor.
- Document Assumptions, Corrective Actions, and Mitigations.

Create a Risk Register

- Document Risk and Modify as Necessary.
- Identify Risk Item Owners and a Tracking/Reporting System.

Developing a Risk Model requires an application of the data collected in the previous step run through a calculating tool.

Estimate Schedule Uncertainty Applied from ESUA in PertMaster

- Import Schedule Data.
- Review Task Detail and Correct if Necessary.
- Establish Correlation between Activities or Groups of Activities.

Update Risk Index

- For each Risk, Qualitatively Assess Probability, Schedule Impact, Cost Impact and Performance Impact.
- Map each Risk to specific tasks.
- Triangulate the Cost and Schedule Quantitative Impacts.

Build the Impacted Plan

- Each Risk Item is added to the Model as a “Task”
- Run the Analysis
- View the Results
- Re-work the Plan

Add Mitigation Plan from Risk Index to Model

- Re-run the plan
- Save the Pre- and Post-mitigation plans

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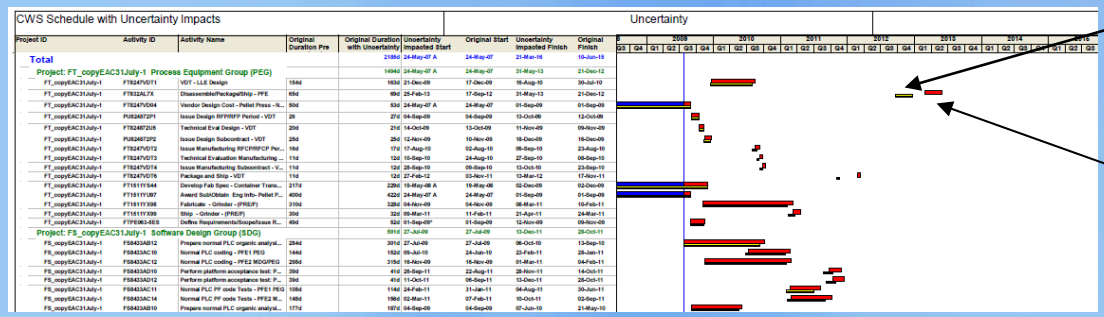
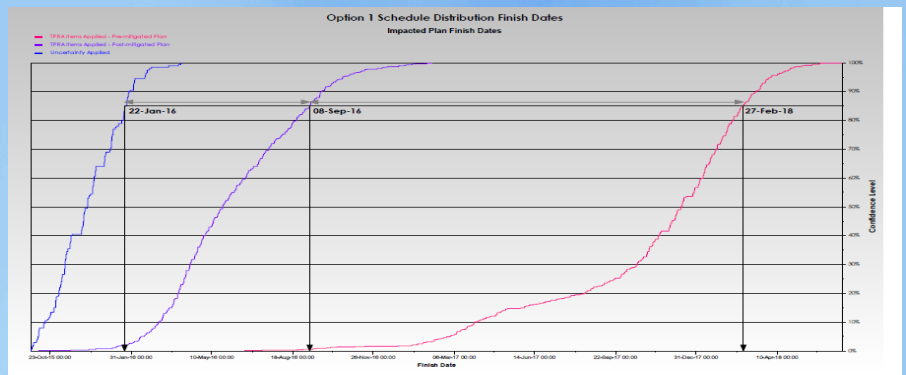
Risk Reporting

Options Dependent on Customer

Schedule Comparison



S-Curves



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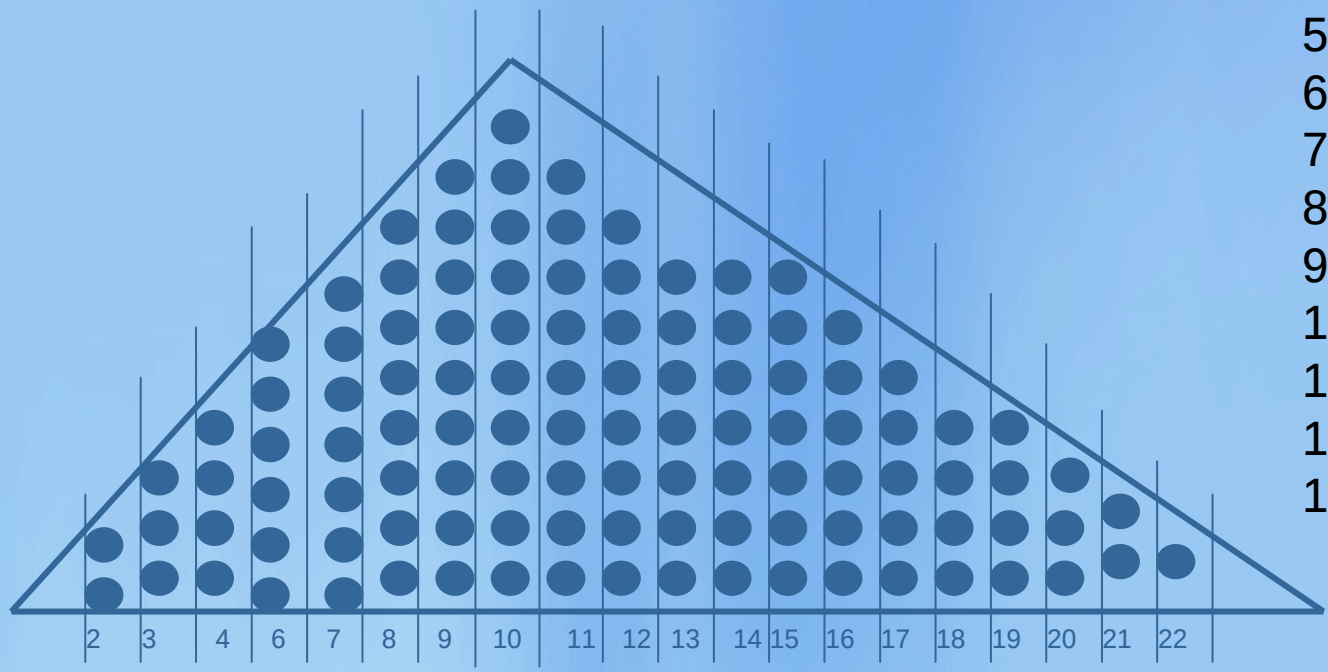
Monte Carlo

Monte Carlo Simulation

- Range forms an “Envelope”
- One Value each Iteration
- Random Simulation of Durations



Optimistic

Likely

Pessimistic

Iterations

1	10 Days
2	9 Days
3	14 Days
4	17 Days
5	10 Days
6	14 Days
7	21 Days
8	13 Days
9	3 Days
10	7 Days
11	18 Days
12	20 Days
13	etc

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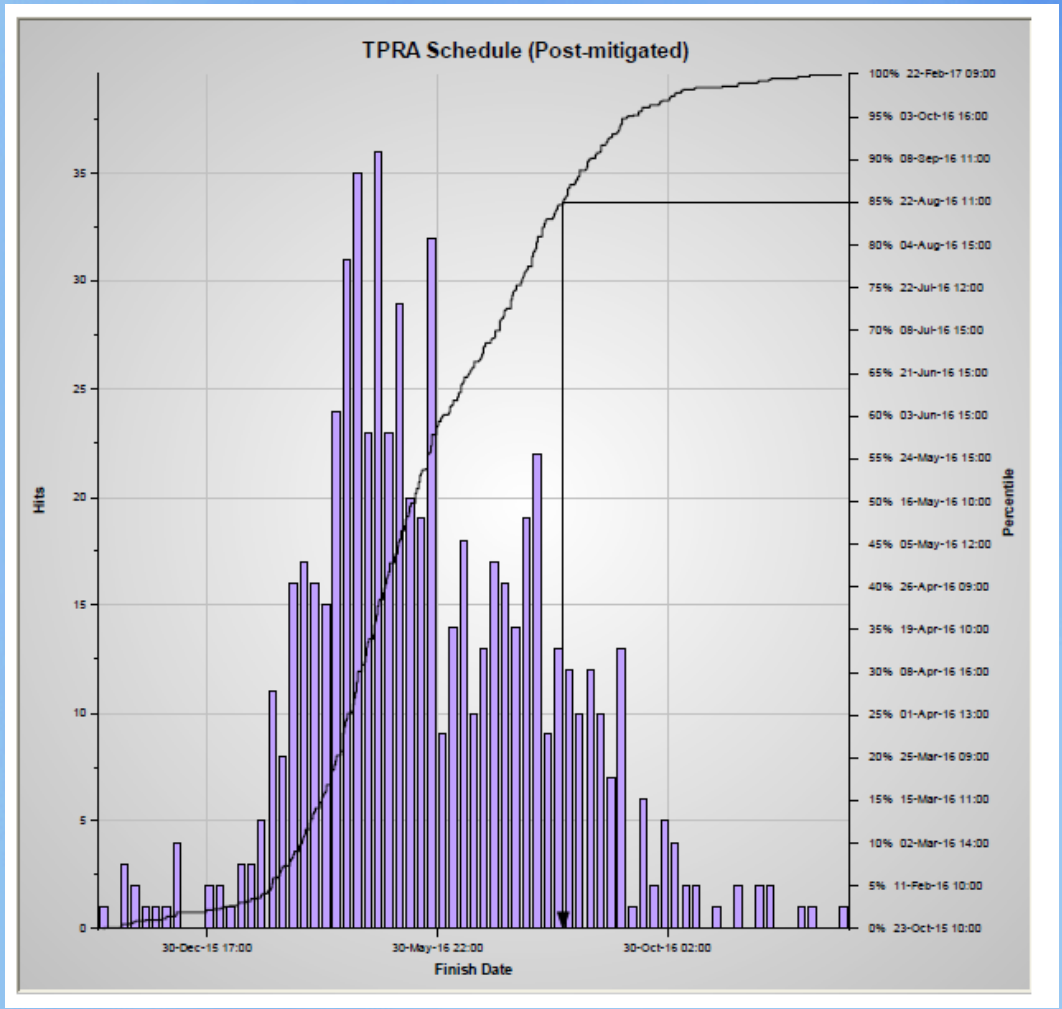
Monte Carlo Simulation



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Risk Summary

Estimate Uncertainty (ESUA)

- Based on a model of “3-Point Estimate”
- Monte Carlo Simulation

Risk Events (TPRA)

- Creates a Registry of Risk Items
- Assign Probability and Impact Values in a Matrix

Risk Mitigation

- Action to reduce the impact of the Risk
- Establishes Contingency

Estimate Uncertainty + Risk Event – Mitigation = Total Risk Exposure

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Technical and Programmatic Risk Management Process

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Identify Risk
- Brainstorming Sessions with SMEs
- Documenting Risk Items in Database

- **Analyze Risk**
  - Evaluate Potential of Risk Occurrence
  - Identify Impact Points in Schedule
  - Identify Owners and Stakeholders

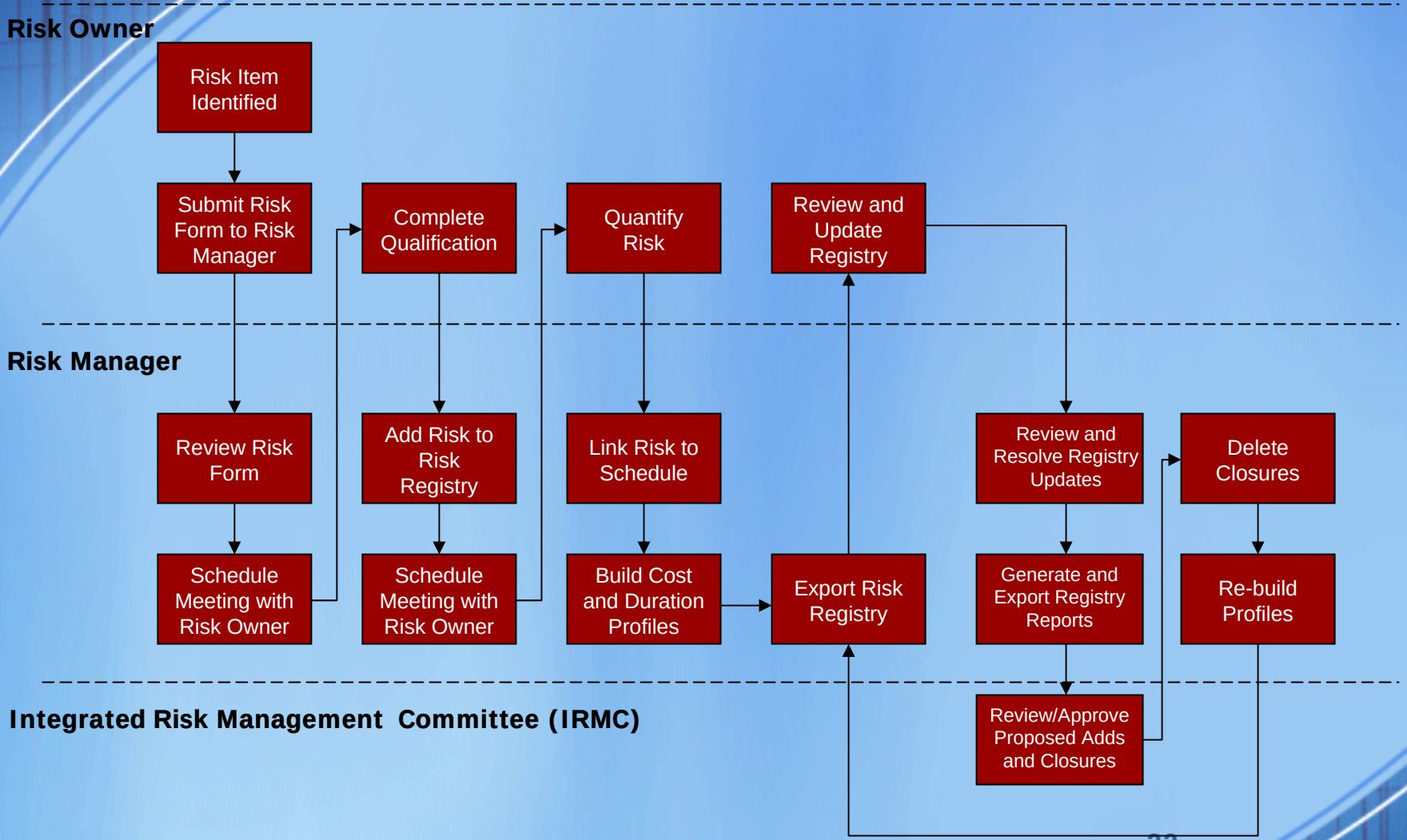
- **Qualify Risk (Low, Medium, High)**
  - Establish Probability of Occurrence
  - Establish Cost and Schedule Impact Ranges
  - Load Risk into Registry and Calculate Risk Score

- **Quantify Risk**
  - Establish Potential Cost of Risk Impact (pre-Mitigation)
  - Establish Potential Schedule Impact (pre-mitigation)

- **Decide Handling Strategy**
  - Accept – Plan as part of PMB
  - Avoid – Plan action required an include in PMB
  - Mitigate (Reduce) – Decide when to take action and when to include action in PMB.
  - Transfer – Concurrence with new Owner
  - Re-Quantify Impacts based on Handling Cost and Actions (post-mitigation)

- **Monitor and status**
  - Update Quarterly or if action occurs
  - Use of Risk Item Change Form
  - Quarterly Reporting from IRMC

Risk Item Management Process



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Brainstorming Form

Date:	**Organization:** *(area affected by the potential risk)*
Name of person identifying potential risk:	
Type of risk : external ☐ commercial ☐ technical ☐ management ☐ project ☐	
Threat ☐ **or Opportunity** ☐	
Title of potential risk:	
What is the normal situation for the element containing the risk? (How should the element function under normal circumstances?):	
What could happen that would adversely or positively affect the normal situation? (What is the potential risk?)	
What impact could the risk have on the normal element operating parameters?	
What can be done to handle the potential risk?	
If this brainstorm item should not be evaluated as a risk, please supply the justification below.	

PPS-7D
Revision 1
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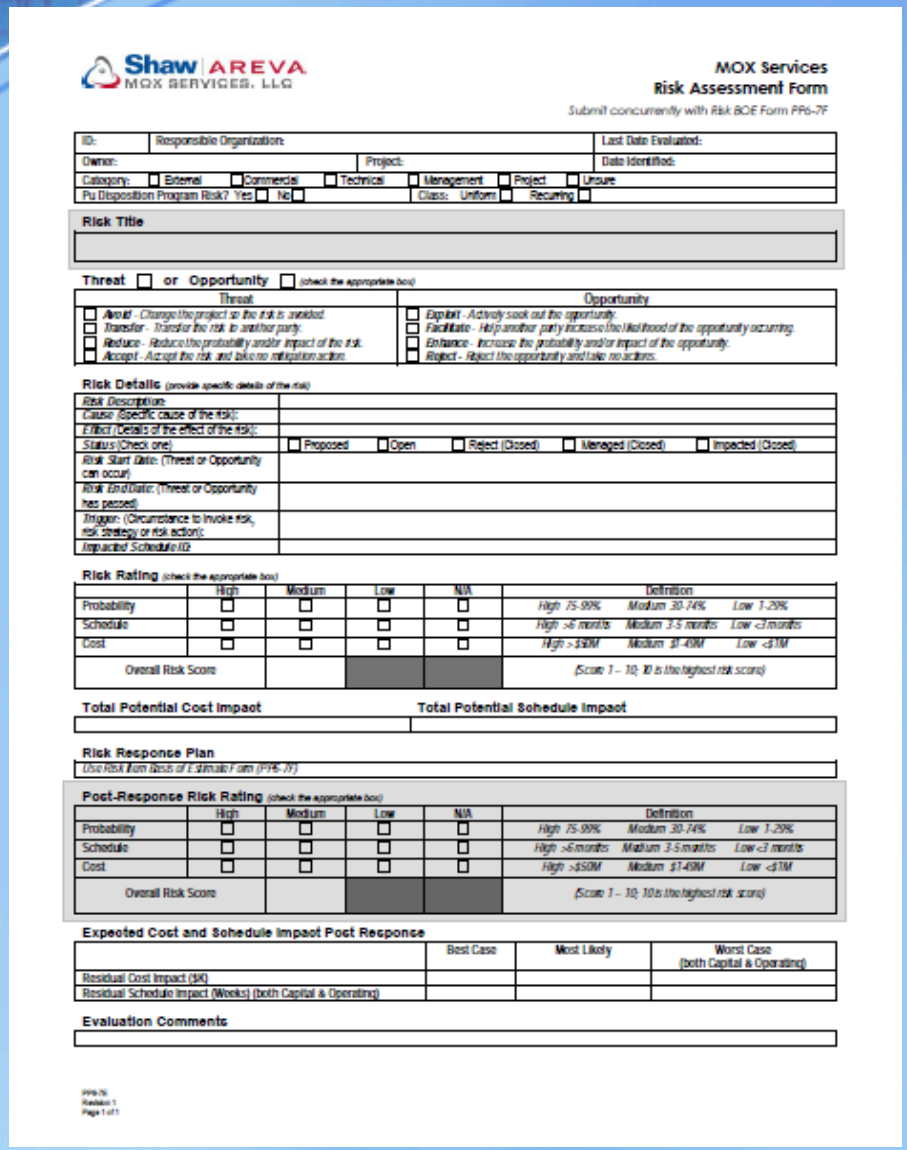

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Risk Assessment Form

Submit concurrently with Risk BOE Form PP6-7F

ID:	Responsible Organization:	Last Date Evaluated:
Owner:	Project:	Date Identified:
Category: ☐ External ☐ Commercial ☐ Technical ☐ Management ☐ Project ☐ Unsure		
Pu Disposition Program Risk? Yes ☐ No ☐	Class: Uniform ☐ Recurring ☐	

Risk Title

Threat ☐ **or Opportunity** ☐ (check the appropriate box)

Threat	Opportunity
☐ *Avoid* - Change the project so the risk is avoided.	☐ *Exploit* - Actively seek out the opportunity.
☐ *Transfer* - Transfer the risk to another party.	☐ *Facilitate* - Help another party increase the likelihood of the opportunity occurring.
☐ *Reduce* - Reduce the probability and/or impact of the risk.	☐ *Enhance* - Increase the probability and/or impact of the opportunity.
☐ *Accept* - Accept the risk and take no mitigation action.	☐ *Reject* - Reject the opportunity and take no actions.

Risk Details (provide specific details of the risk)

Risk Description:	
Cause (Specific cause of the risk):	
Effect (Details of the effect of the risk):	
Status (Check one)	☐ Proposed ☐ Open ☐ Reject (Closed) ☐ Managed (Closed) ☐ Impacted (Closed)
Risk Start Date: (Threat or Opportunity can occur)	
Risk End Date: (Threat or Opportunity has passed)	
Trigger: (Circumstance to invoke risk, risk strategy or risk action):	
Impacted Schedule ID	

Risk Rating (check the appropriate box)

	High	Medium	Low	N/A	Definition
Probability	☐	☐	☐	☐	*High 75-99% Medium 30-74% Low 1-29%*
Schedule	☐	☐	☐	☐	*High >6 months Medium 3-5 months Low <3 months*
Cost	☐	☐	☐	☐	*High >$50M Medium $1-49M Low <$1M*
Overall Risk Score					*(Score 1 – 10; 10 is the highest risk score)*

Total Potential Cost Impact | **Total Potential Schedule Impact**

Risk Response Plan

Use Risk Item Basis of Estimate Form (PP6-7F)

Post-Response Risk Rating (check the appropriate box)

	High	Medium	Low	N/A	Definition
Probability	☐	☐	☐	☐	*High 75-99% Medium 30-74% Low 1-29%*
Schedule	☐	☐	☐	☐	*High >6 months Medium 3-5 months Low <3 months*
Cost	☐	☐	☐	☐	*High >$50M Medium $1-49M Low <$1M*
Overall Risk Score					*(Score 1 – 10; 10 is the highest risk score)*

Expected Cost and Schedule Impact Post Response

	Best Case	Most Likely	Worst Case (both Capital & Operating)
Residual Cost Impact ($K)			
Residual Schedule Impact (Weeks) (both Capital & Operating)			

Evaluation Comments

PP6-7S
Revision 1
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Shaw AREVA MOX SERVICES, LLC	Risk Item Basis of Estimate *To be included with Risk Assessment Form (PPG-7E)*
Risk ID: Title: Owner:	Date Prepared:

If no action is taken:

Potential Cost Impact: *(provide explanation/breakdown of potential cost impact)*
Potential Schedule Impact: *(provide explanation/breakdown of potential schedule impact)*

Risk Response Plan:

(details)
Cost to implement plan:
Schedule impact to implement plan:

After plan implementation:

Expected Cost Impact: *(provide explanation/breakdown of expected impact including best case, most likely and worst case)*
Expected Schedule Impact: *(provide explanation/breakdown of expected impact including best case, most likely and worst case)*

PPG-7F
Revision 0
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Risk Comparisons

DOE Risks Characteristics	Non-DOE Risk Characteristics
Identified During Planning Phase and through Implementation	Identified during Early Project Initiation and Definition Phase and through implementation
May include Threats and Opportunities	Only include Threats! Opportunities are BD responsibilities.
Impact must be qualified in pre-mitigation.	If impact is considered “low”, no further action required. Treated as an “Assumption”.
Handling strategies include avoidance, acceptance and mitigation.	Any handling of the risk is for mitigation. Acceptance is considered “paying to mitigate”.
Typical Risk Matrix is 3X3 or 5X5	Matrix may be 9X9 to include impacts on customers or public.
Risk Management is tied to Standard Guidelines.	Risk Programs are developed by the Project Steering Committee based on Project Complexity.

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Non-DOE RISK Process

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RISK Handling

Risk Identified as:

- **Business (financial, legal, Market, Political)**
- **Process (Procedural)**
- **Project (technical)**

Risks are Ranked by Probability and Impact (Qualified)

- **Only High Scored Risks have Mitigation Plans**
- **All Risk are Periodically Reviewed for Score Changes**

HIGH RISKS are Classified as "Unacceptable" and must be mitigated to lower score before Project can proceed

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RISK Impact

- Not Calculated against the schedule.
- Consequences not quantified unless they effect the business decision.
- Any Risk that becomes a reality must be mitigated.
- Acceptance is considered “mitigation” if it does not delay the project.
- Documented Risks are used to justify “Change Orders”.