U233 Project Risk Management

History and Process

Overview

- History
  - Current Baseline
- Process Overview
  - Identification
  - Simulation
  - Management
- Successes & Challenges

History

- Current Baseline Risks
  - 1 Week Risk Summit held week of August 4th, 2008
    - Broad representation from all levels of Isotek, DOE, PTC, and outside consultants
    - Focused on risk and opportunity identification
      - Included risk description, assumptions, and triggers
      - No quantification or analysis
      - No restrictions, constraints, or filtering
    - HQ provided facilitator
      - Prescribed format and capture methodology

History

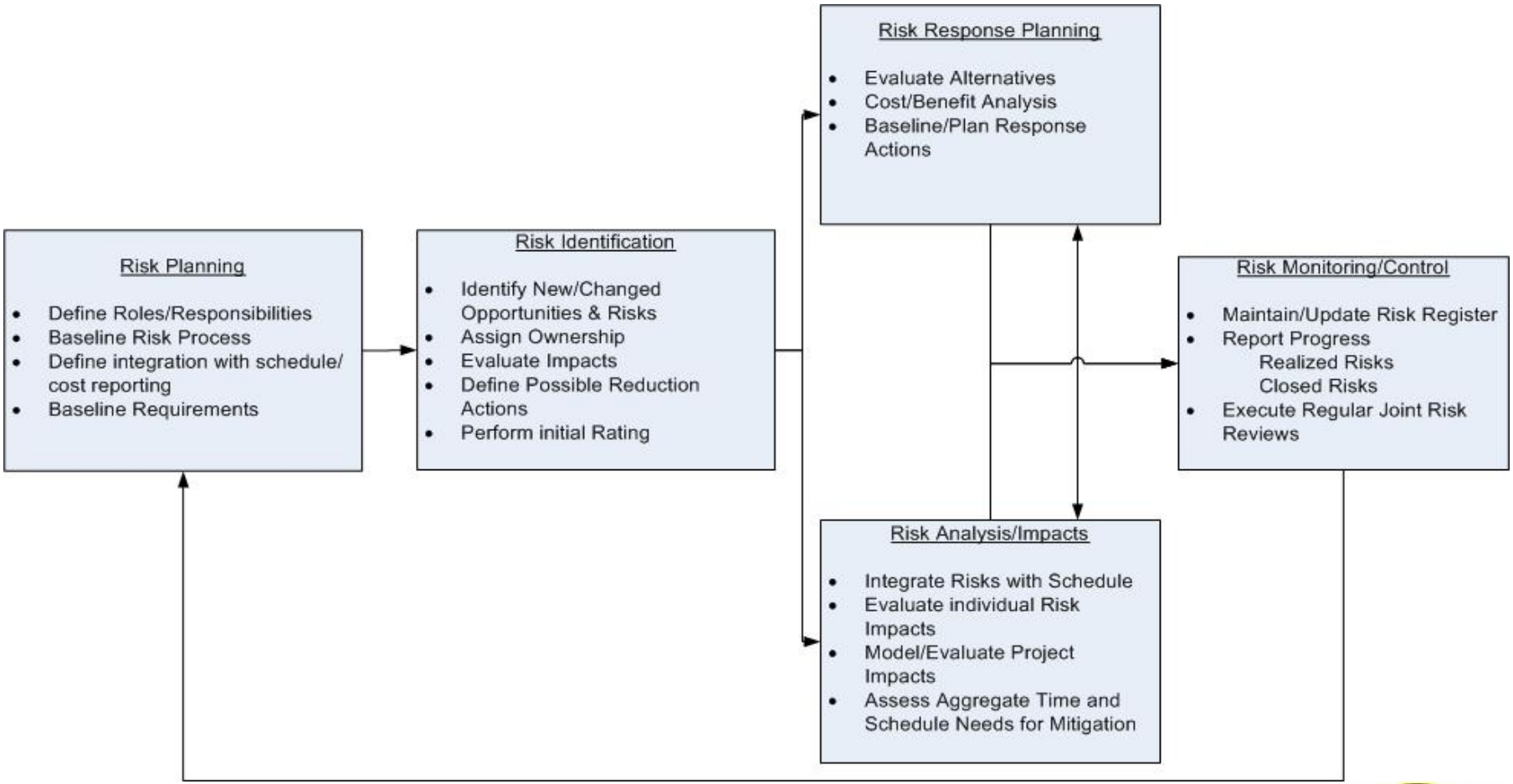
- Current Baseline Risks
  - Risk Summit Results
    - Isotek tasked with:
      - Identifying additional contractor risks
      - Using information to prepare new baseline
      - Completing Risk Register with handling actions
    - PTC tasked with:
      - Working with DOE to identify additional government risks
      - Independent analysis of risk impacts (Cost)
- Results – Integrated (Contractor/Government) Risk Register

History

- Risk Register Items Quantified
  - Probability
  - Impact (Cost, Schedule)
- Monte Carlo Model developed from baseline and simulations executed to validate MR (details later)
- Additional Information
  - Risk Manager position created within Isotek
  - Regular part of management process

Process

Process Flow



Process – Risk Planning

- Risk Management Plan
  - Roles & Responsibilities clearly identified
  - Frequency of updates
  - Process description
- Process Improvements
  - Working towards integrating risks into Primavera
    - Use of activity notes, or
    - Risk listing
    - Still evaluating concept

Process – Risk Identification

- "Triggers" and Planned Sessions
  - Triggers
    - Changes to the baseline or overall solution approach
    - Discovery of new information affecting solution
      - Typically found while accomplishing work, or discussions in related meetings
  - Planned Sessions
    - Regularly held meetings to identify and review upcoming risks based on current work
    - Periodic full review of risk register with team
  - Both DOE and contractor participation
  - Results report produced after each meeting
  - While risk identification is not the main focus of each risk meeting, it is always pursued.

Process – Risk Identification

- Risk are typically captured directly in the Risk Register.
- Partial input is accepted – details after meetings
- Forms developed off of Risk Register

	B	D	E	G	H	I	J	K	L	M	N	O
1	Risk #	Risk Statement	Last Review	Risk Owner	Risk Status	Risk Assumptions	Trigger Metric	Prob	Conseq	Risk Impact Rating	Handling Strategy	Handling Steps
77	T66	Human resource turnover with necessary security credentials impacts project schedule and cost.	8/13/2009	K. Engle	Open	* HR assumptions for turnover rates *	Backup support personnel mobilized for filling position	Low	Marginal	Low	port personnel who mee	1. Operations list detailing work skills clearance requirements and training t 2. Soliciting contractor firms for perso availability and lead times requireme 3. Review staffing personnel with posi qualifications or availability for cross
78	T67	Actual cost escalation is greater than OECM guideline estimates.	8/5/2009	S. Barnes	Open	1. FY09 escalation is 2.1%.	Submittal of Baseline in November	Medium	Marginal	Low		
79	T68	Actual cost escalation beginning FY10 is greater than regional estimates.		S. Barnes	Closed - covered in T67	1. DOE-OR requests relief from OECM regarding regional rates for certain areas (e.g. materials).		-Closed-	-Closed-	Closed		
80	T69	Unavailability of qualified nuclear operators delaying the start of operations.	8/13/2009	D. Moore	Open	1. Demand remains high for qualified nuclear operations personnel. 2. Commercial nuclear industry has major expansion in 2012. 3. Shortage becomes more severe near startup and continues throughout operations.	Turnover of staff	Medium	Significant	Moderate	Mitigate	1. Staffing plan to include sufficient re for projected turnover
81	T70	Inexperienced nuclear operators results in an accident or error.	8/13/2009	D. Moore	Open	1. Lack of personnel extend work hours for existing staff. 2. More of work force is inexperienced due to turnover. 3. Staff is position-qualified. 4. One accident/incident is assumed	Accident or error occurs as a result of inexperience	High	Marginal	Moderate	Mitigate	1. Develop rigorous OJT program. 2. Perform independent assessment or Training and Qualification program fo processing

Process – Risk Analysis

- Identified Risks Used in Two Ways
  - Modeling – expected cost and schedule
    - Assess feasibility of meeting cost and schedule
    - Tie risk events to a timeframe/baseline
    - Typically done for BCP's or annually
  - Response/Management
    - Recurring attention
    - Tracking and recording of progress on eliminating or reducing risks
      - Consequence or likelihood of occurrence

Risk Analysis – Isotek Rating Scales

Qualitative	Criteria	Rating
Very Low	• Is extremely unlikely to occur anytime in the life cycle of the project or its facilities.	<1% 1
Low	• Is unlikely to occur in the life cycle of the project or its facilities (i.e., there is not much chance the event will happen).	1% to 14% 2
Moderate	• Will likely occur sometime during the life cycle of the project or its facilities (i.e., there is a moderate chance of the event happening).	15% to 49% 3
High	• Will very likely occur sometime during the life cycle of the project or its facilities (i.e., there is a high chance the event will happen).	50% to 79 % 4
Very High	• Will most likely occur sometime during the life cycle of the project or its facilities (i.e., everything points to the event happening).	>80% 5

Risk Analysis – Isotek Rating Scales

Qualitative	Cost	Schedule	Rating
Negligible	• Minimal or no consequence. No impact to Project cost. • <$600K	• Minimal or no consequence. No impact to Project schedule. • < 2 Weeks	1
Marginal	• Small increase in meeting objectives. Marginally increases costs. • >600K and < $2M	• Small increase in meeting objectives. Marginally impacts schedule. • <2 Months	2
Significant	• Significant degradation in meeting objectives significantly increases cost; fee is at risk. • >$2M and <$6M	• Significant degradation in meeting objectives, significantly impacts schedule. • >2 months and <6 months	3
Critical	• Goals and objectives are not achievable. Additional funding may be required; loss of fee and/or fines and penalties imposed. • >$6M and <$15M	• Goals and objectives are not achievable. Additional time may need to be allocated. Missed incentivized and/or regulatory milestones. • >6 months and <1 year	4
Crisis	• Project stopped. Funding withdrawal; cure notice, withdrawal of scope, or imminent contract cancellation. • >$15M	• Project stopped. Withdrawal of scope, cure notice, or imminent contract cancellation. • >1 year	5

Risk Analysis – Isotek Rating Scales

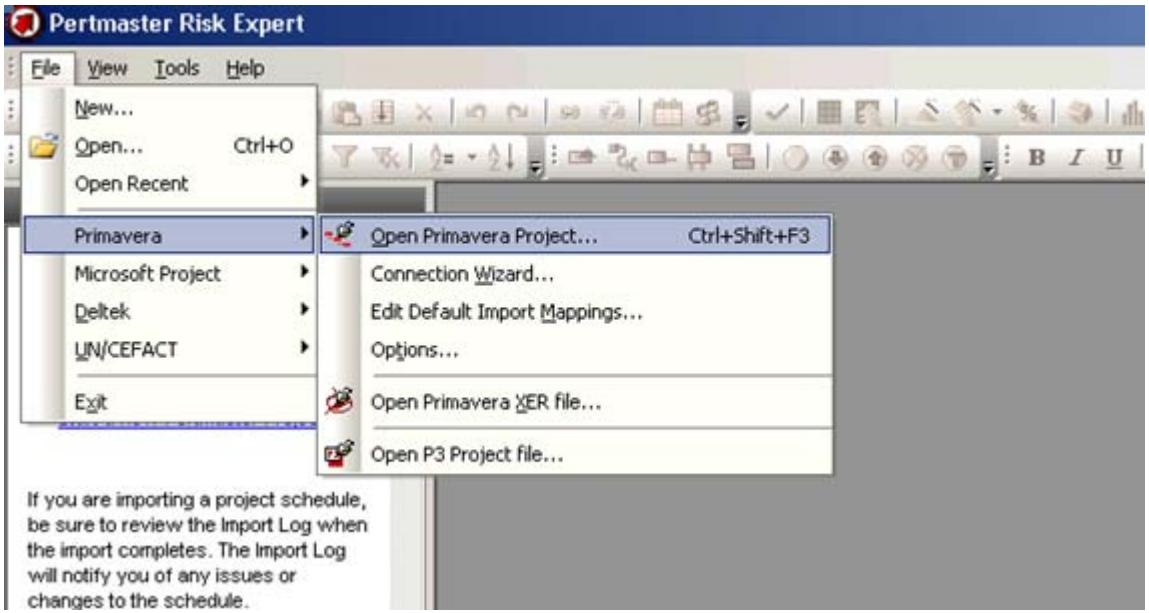
- Risk Rating Matrix – Sample Data

Ranking - Risk Matrix

Probability			Impact: Negligible 1	Marginal 2	Significant 3	Critical 4	Crisis 5
	Very Low	1	Low	Low	Low	Low	Moderate
	Low	2	Low	Low	Low	Moderate	Moderate
	Moderate	3	Low	Low	Moderate	Moderate	High
	High	4	Low	Moderate	Moderate	High	High
	Very High	5	Low	Moderate	High	High	High

Risk Analysis – Modeling

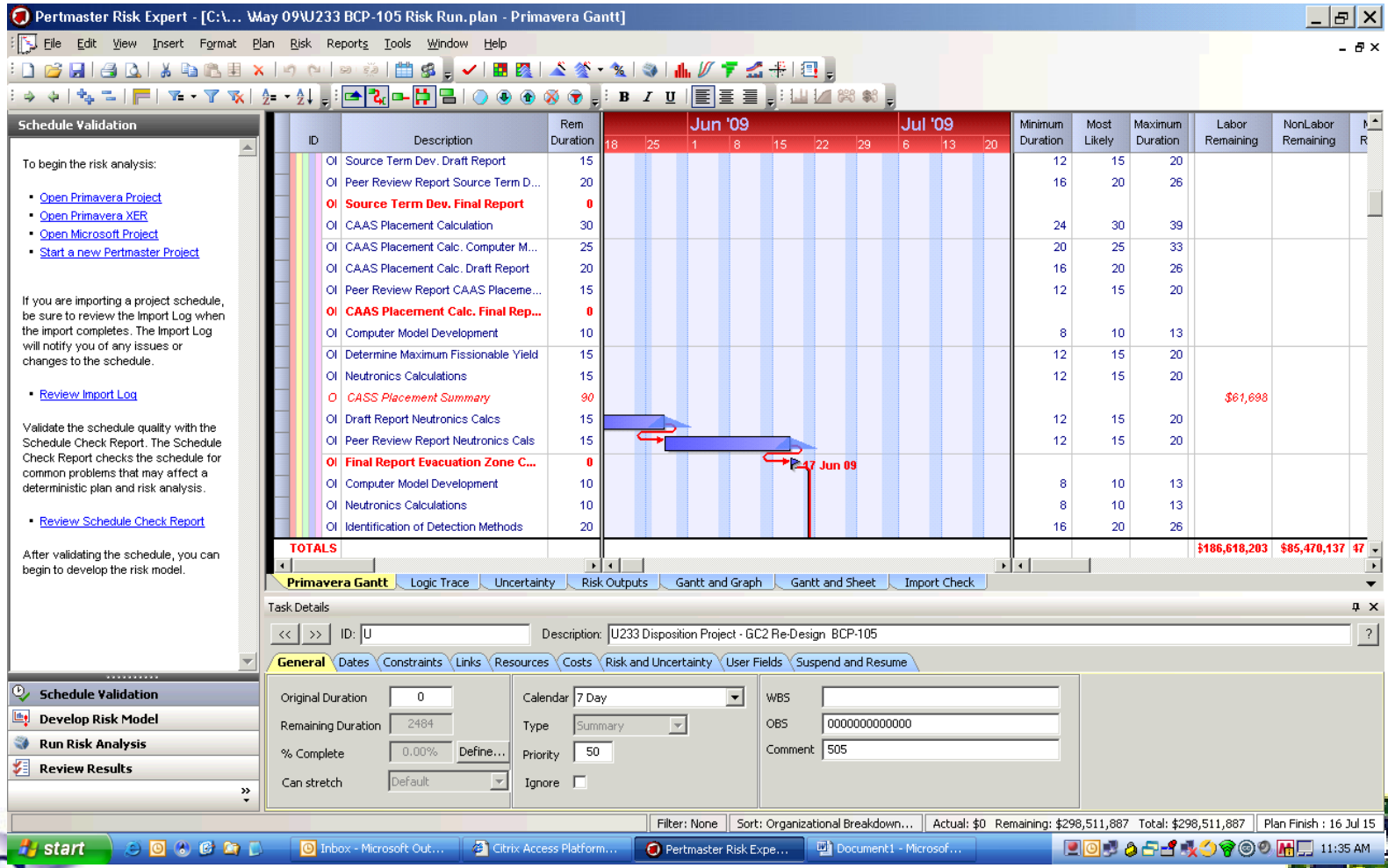
- Develop Risk Model
  - Incorporate current baseline information



Environmental Management

Process

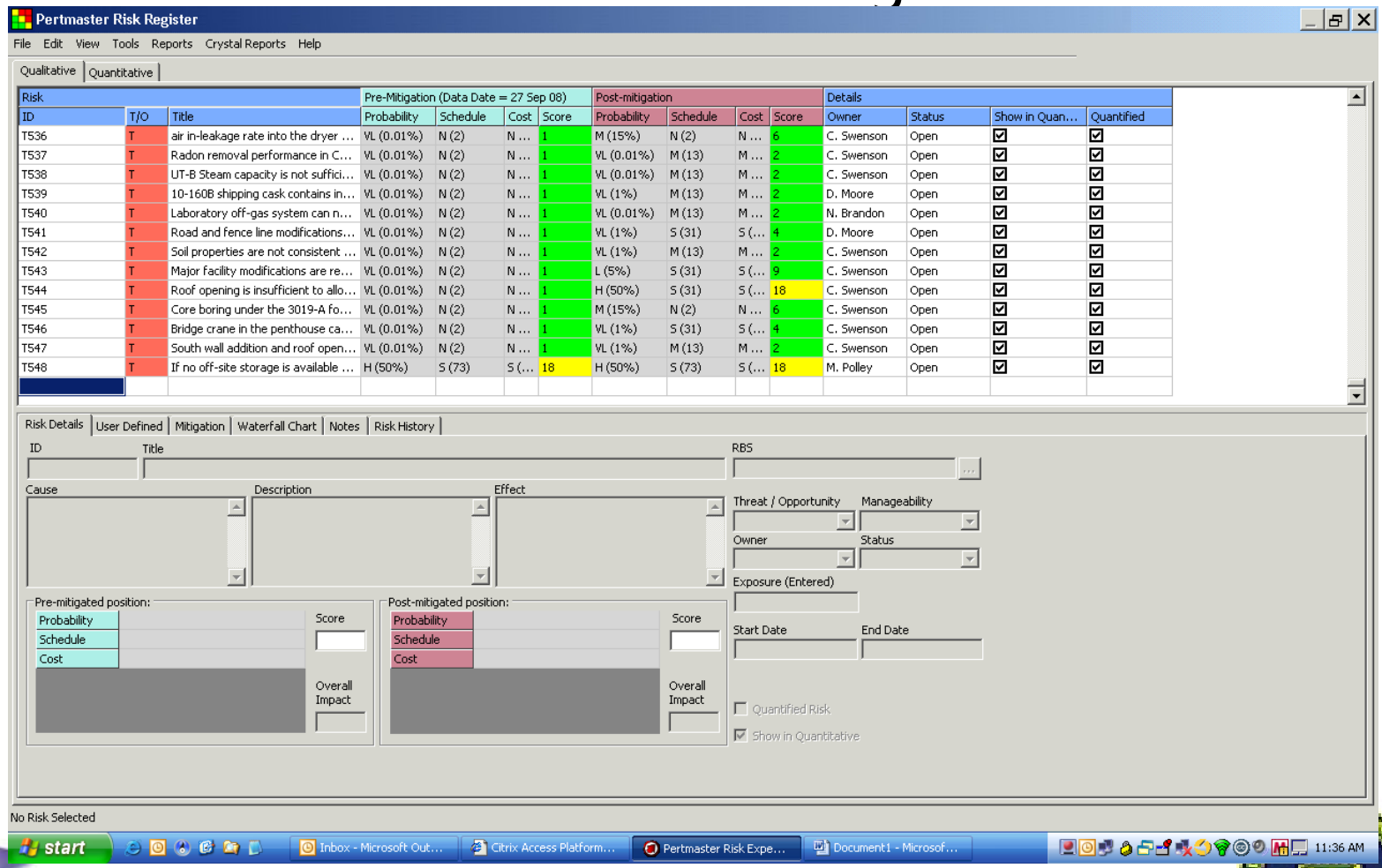
- Assign general uncertainty distributions



Environmental Management

Risk Analysis – Modeling

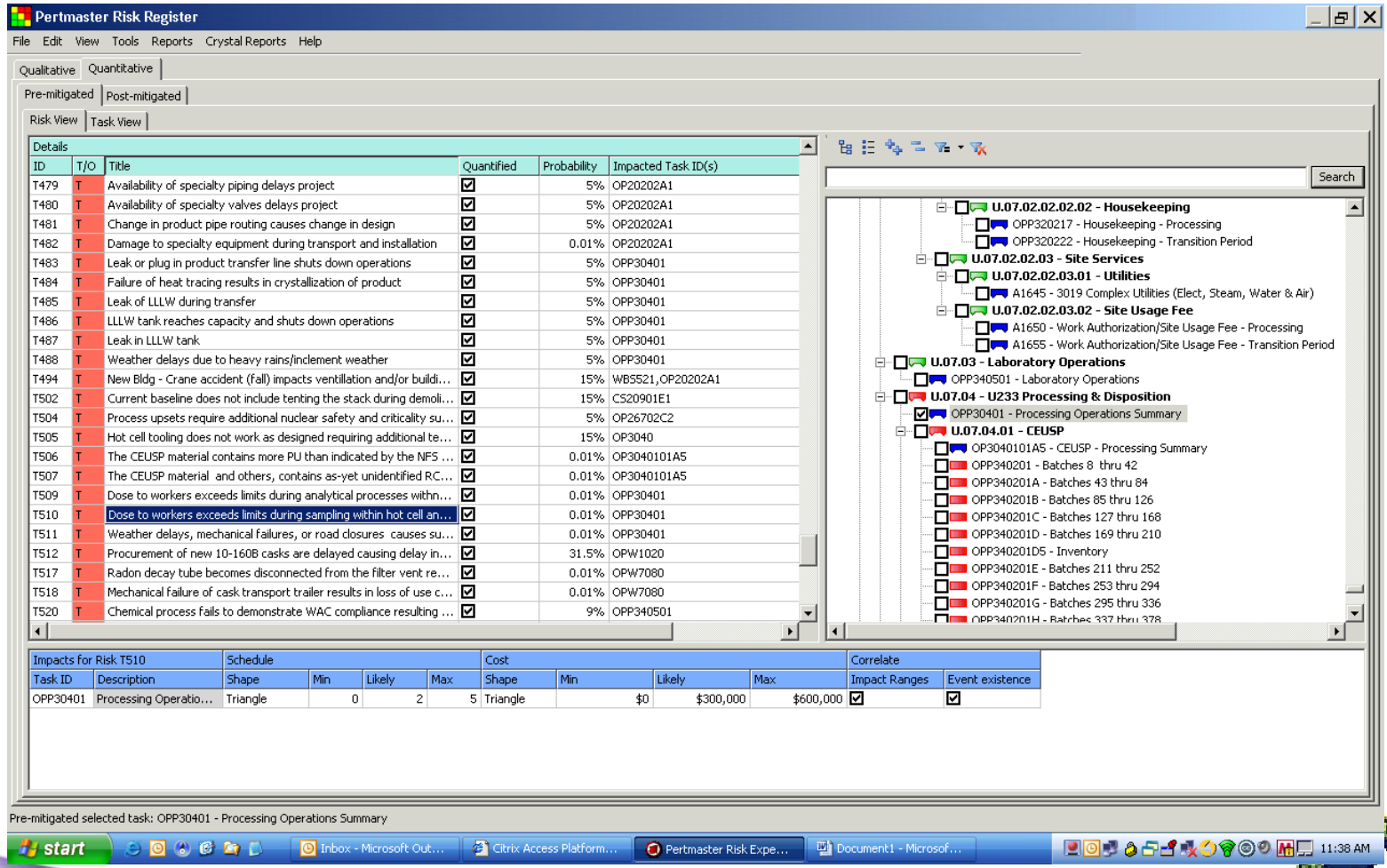
- Add event risks from Risk Register



Environmental Management

Process

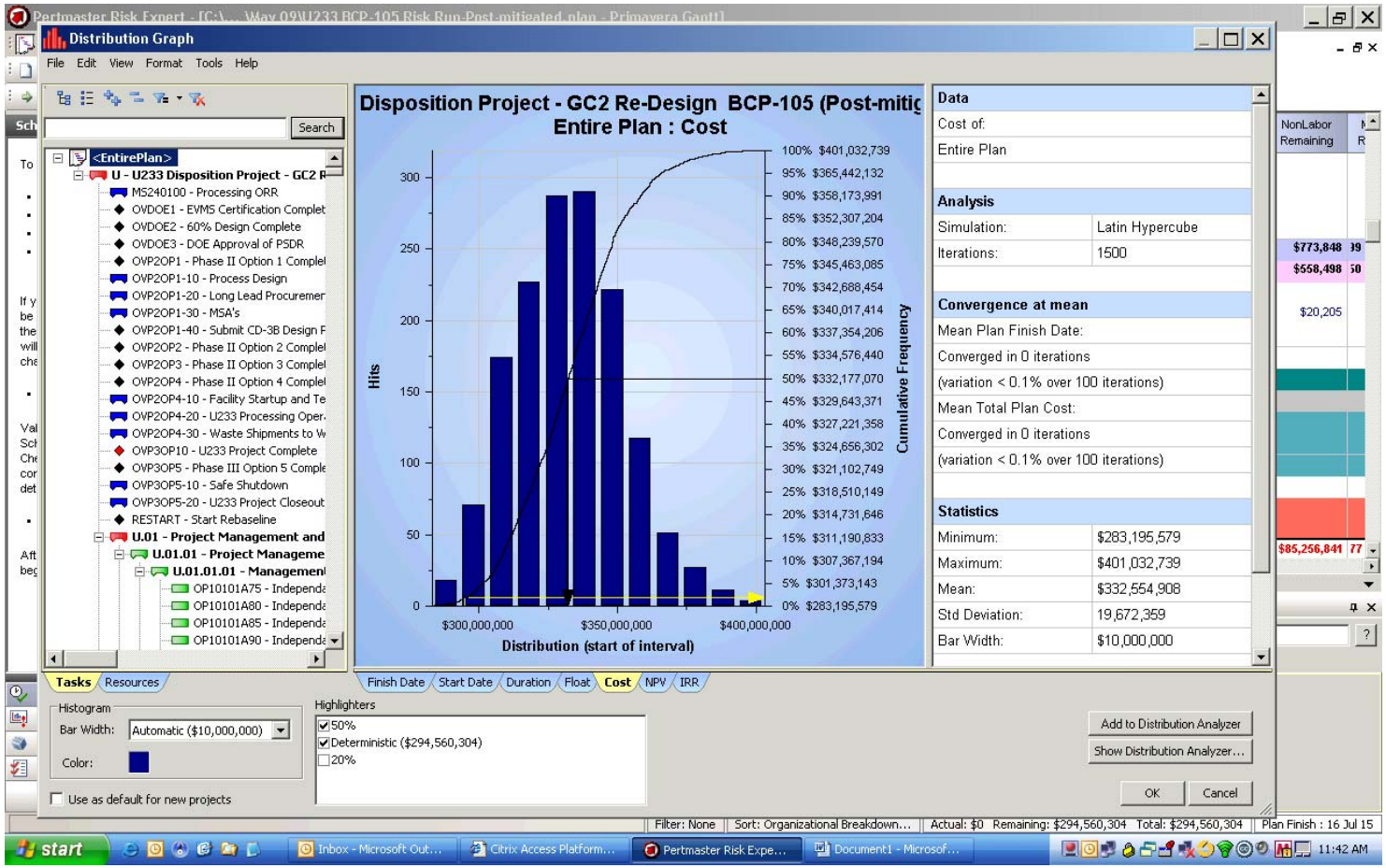
- Quantify and tie event risks to activities



Environmental Management

Risk Analysis – Modeling

- Validate data and run simulation



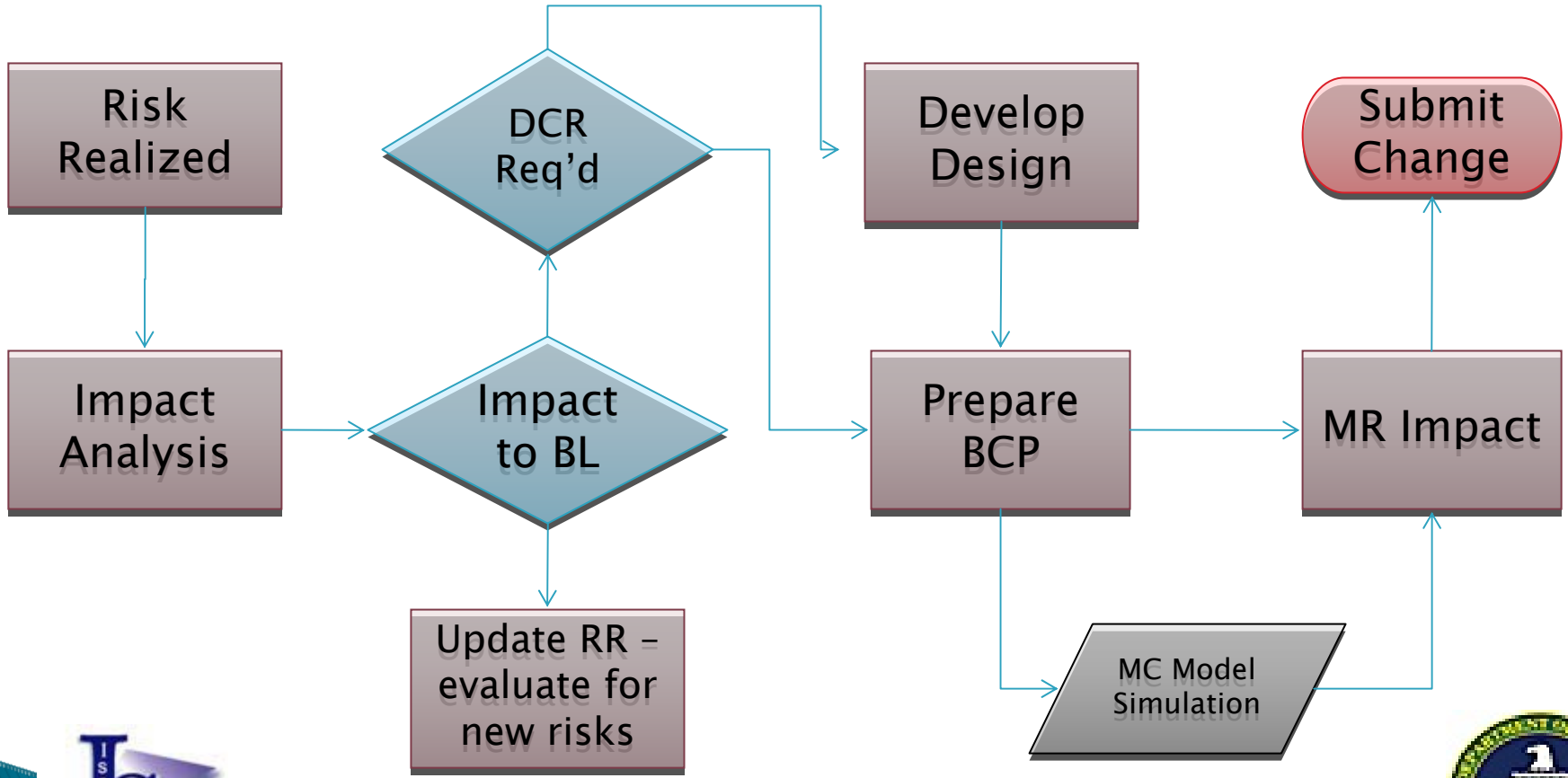
Environmental Management

Risk Analysis – Management

- Regular Meetings (mentioned earlier)
  - DOE and Isotek participation
  - Joint identification and problem solving
  - Facilitated with Risk Register projected
  - Topics/focus based on current work or recent developments – varies from meeting to meeting
    - NOT intended to pound through the register every meeting.
- Keep working toward "institutionalizing" the risk process
  - Regular part of daily work
  - Reinforced/Full support demonstrated by Isotek and DOE management

Risk Analysis – Management

- Realized Risks and Closed risk process.



Federal Risk Management

- Applies to programmatic risks and risk events outside the control of the contractor.
- Processes parallel Isotek's
  - Integrated when possible for "full project view"

- Risk Planning
  - Federal Risk Management Plan

Federal Risk Identification and Analysis

- Risk Identification
  - Risk Summit
  - Quarterly Reviews and ongoing as risks emerge
- Risk Analysis
  - Documented on Risk Assessment Form, summarized in Risk Register
  - Risk Rating scales and Risk Matrix consistent with ORO-EM risk program
  - Federal risk details into integrated project risk register and modeling

Federal Risk Analysis – DOE Risk Matrix

PROBABILITY	CONSEQUENCE				
	Negligible (<0.2% TPC)	**Marginal** (0.2-1% TPC)	**Significant** (1-3% TPC)	**Critical** (3-10% TPC)	**Crisis** (>10% TPC)
Imminent (>90%)	Moderate	Moderate	High	High	High
Very Likely (75-90%)	Low	Moderate	Moderate	High	High
Likely (25-75%)	Low	Low	Moderate	Moderate	High
Unlikely (10-25%)	Low	Low	Low	Moderate	High
Very Unlikely (<10%)	Low	Low	Low	Low	Moderate

Federal Risk Management

- Quarterly review of federal risks
  - Revise analysis as needed
  - Close risks and identify emerging risks to add

- First realized risks have just recently occurred
  - Impacts submitted, working through processes for baseline and contract change control for use of Funded Contingency

Successes/Challenges

- Identification
  - Successes
    - Many risks identified
    - Regular process
    - Managers are “in-tune” with risk identification
  - Challenges
    - Risk vs. baseline requirement
    - Drawing the line between real risk, and daily/expected behaviors
      - Risk exists everywhere in everything – too few vs. too many – see next chart….

Successes/Challenges

Risk identification "too many/too few"

A trip to the grocery store

- Unsafe driving could result in accident/delay
- Lack of preparation could result in 2nd trip
- Inaccurate estimate could result in failure to attain necessary supplies

- Unsafe driving could result in accident/delay
- Unsafe driving could result in ticket/delay
- Unsafe driving could result in pedestrian casualty causing delay
- Inattention in parking lot could result in pedestrian accident
- Inability to locate car keys could cause delay
- Lack of vehicle maintenance could prevent use of car resulting in delay
- Mechanical failure of vehicle could result in delay
- Lack of preparation could result in 2nd trip
- Inaccurate estimate could result in failure to attain necessary supplies
- Incomplete requirements (list) could result in additional trips
- No Wallet – start over…..

This?

Or This?

Successes/Challenges

- Modeling/Simulation
  - Successes
    - "Fairly" well integrated with baseline
    - Risks are tied to specific activities in the schedule
    - Results of risk runs (simulations) consistent
  - Challenges
    - Risks that shift the paradigm (criticality) – modeling those for cost/schedule impact questionable
    - Accuracy of estimates – lot's of information needed, very little available (both in assessing probability and consequence)
    - Uncertainty vs. Risk – we don't know what we don't know….
      - Keep trying to reduce the unknowns – ongoing effort

Successes/Challenges

- Management
  - Successes
    - Risks are being closed regularly
    - Culture is being instilled
  - Challenges
    - How much is enough – can go on and on…
    - Integrating

Current Status

- 568 Risks/Opportunities Identified
- 346 Open
  - 1 High
  - 62 Moderate
  - 283 Low

    - Note: there are project ending risks with low probability. These are not modeled, but are continually managed.