U.S. DEPARTMENT OF ENERGY | OFFICE OF ENVIRONMENTAL MANAGEMENT

EM-LA Lifecycle Costs and Risk

ENVIRONMENTAL MANAGEMENT
SAFETY ❖ PERFORMANCE ❖ CLEANUP ❖ CLOSURE

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What is Risk?

- International Organization for Standardization's (ISO) Guide 73:2009 defines risk as "effect of uncertainty on objectives - positive and/or negative"
  - Effect is the difference between the actual result from the expected outcome
- ISO Guide 73:2009 defines Risk Management as the "coordinated activities to direct and control an organization with regard to risk"

EM-LA Risk Management

- EM-LA's Federal Risk Management Plan major over-arching objectives:
  - Develop and maintain a risk management plan at the appropriate level
  - Continuously identify and document new risks
  - Implement, track, and update risk handling strategies for effective management
  - Monitor and report on risks

Quantifying Risk

Risk Analysis

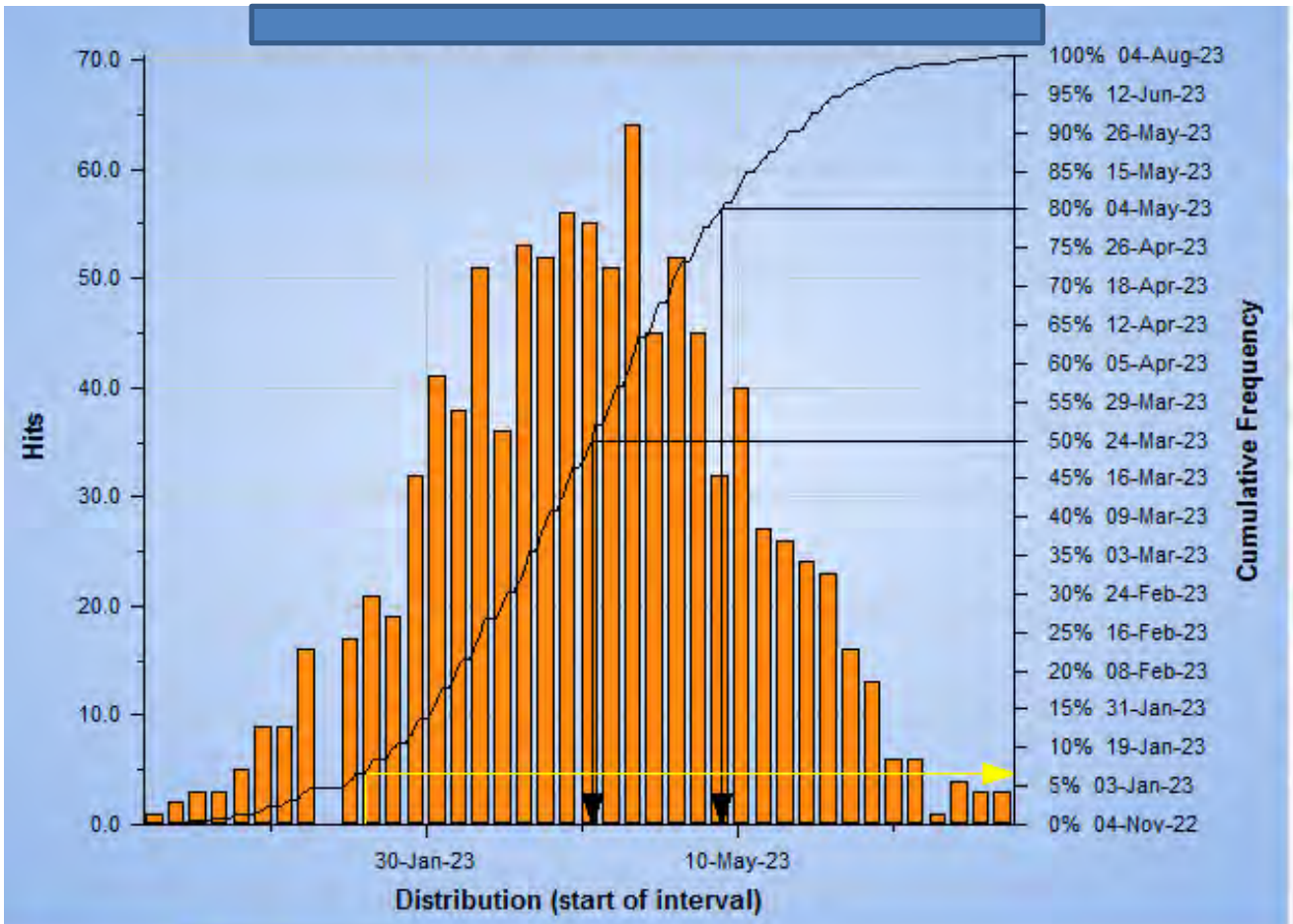
- Assess the probability of a risk occurring and the consequence of occurrence through use of a Monte Carlo simulation
  - Probability defined in terms of: unlikely, likely, and very likely
  - Consequence defined in terms of: marginal, significant, and critical
- After assessment scores are assigned based on the probability and potential impact

Probability	Consequence: Marginal	Consequence: Significant	Consequence: Critical
Very Likely	Moderate	High	High
Likely	Low	Moderate	High
Unlikely	Low	Low	Moderate

EM-LA Risk Management

- Putting a dollar value on risk:
  - DOE contingency is the combined cost associated with mitigating a risk or accommodating a risk
    - The new lifecycle cost estimate at $2.9B is the cost associated with the actual planned work based on assumptions
    - It does not include DOE contingency for EM-LA project or programmatic risks

EM-LA Monte Carlo Example – Schedule



Finish Date of:

Example

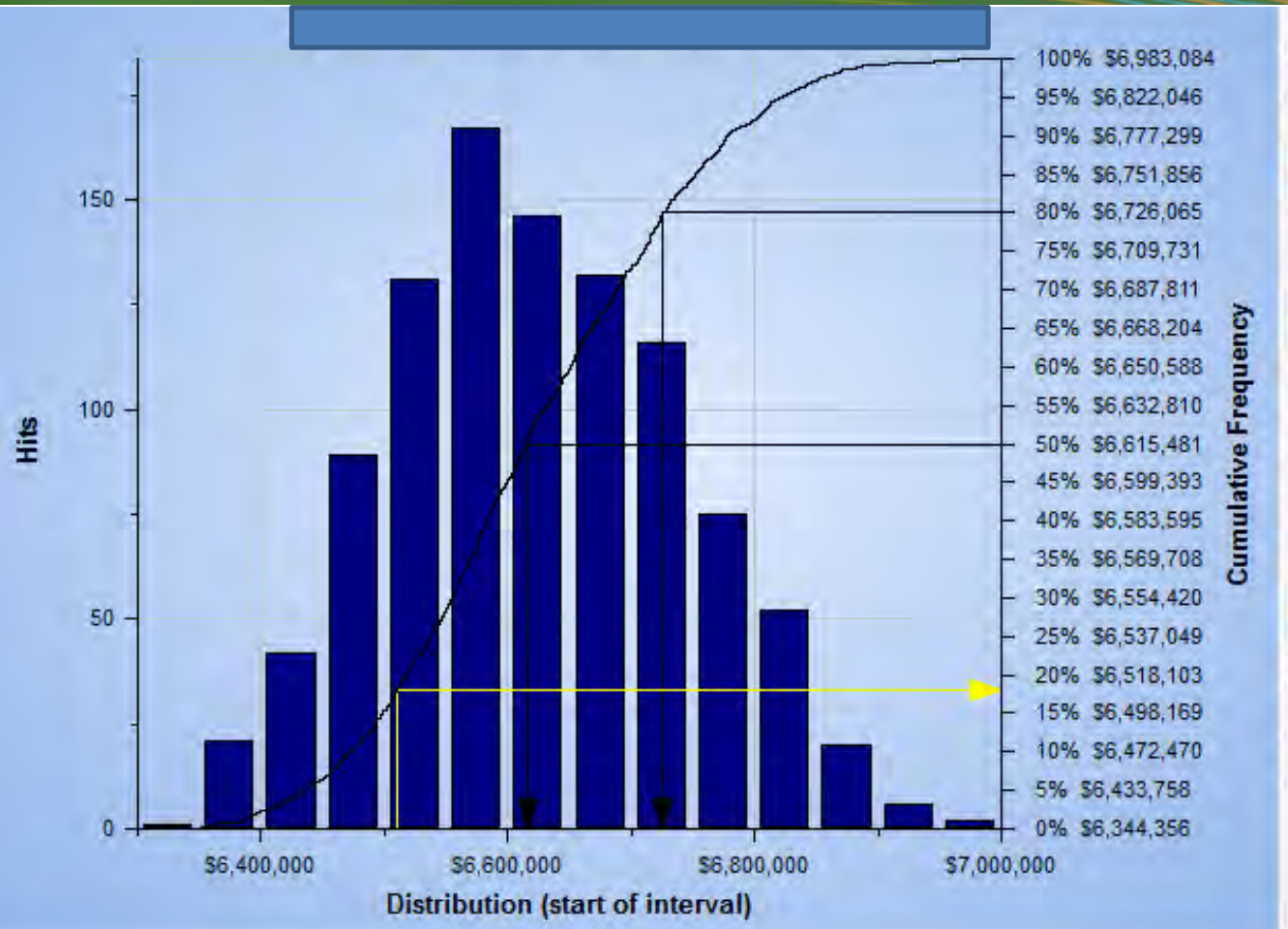
Analysis	
Iterations:	1000

Statistics	
Minimum:	04-Nov-22
Maximum:	04-Aug-23
Mean:	22-Mar-23
Bar Width:	week

Highlighters	
Deterministic (09-Jan-23)	7%
50%	24-Mar-23
80%	04-May-23

Finish Date | Start Date | Duration | Float | Cost | NPV | IRR

EM-LA Monte Carlo Example – Cost



Cost of:

Example

Analysis	
Iterations:	1000

Statistics	
Minimum:	$6,344,356
Maximum:	$6,983,084
Mean:	$6,622,625
Bar Width:	$50,000

Highlighters	
Deterministic ($6,509,502)	18%
50%	$6,615,481
80%	$6,726,065

Finish Date | Start Date | Duration | Float | **Cost** | NPV | IRR