



Using Decision Analysis to Improve Efficiency

Reducing Costs, Accelerating Schedules, and Making
Better Decisions Faster

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Most Corporate Challenges Don't Present Themselves as Decision Analysis Problems

- Most activity is thought of as 'execution'
- Focus is rightly placed on speed and efficiency
- This is true even more in current economic climate
- DA techniques not always thought of as supporting these imperatives

However – DA can make a huge contribution through application in new and creative ways

Two Examples

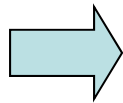
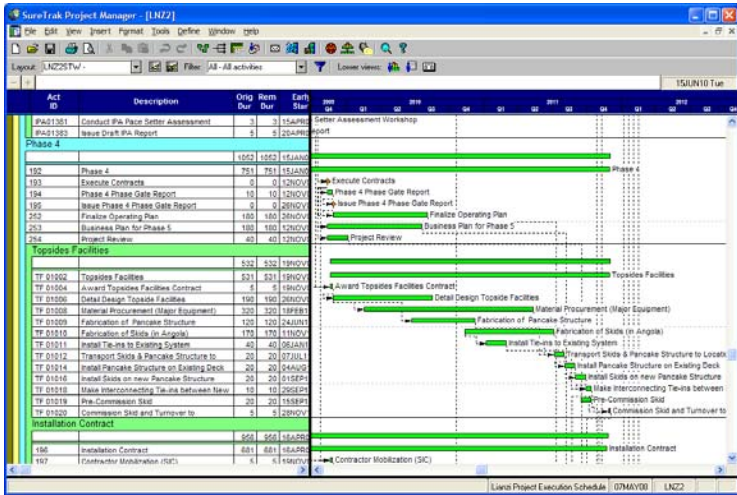
- DA Used to Accelerate Schedule
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- Faster, More Efficient Decisions

During “Project Execution”, meeting or beating schedule is of critical importance.

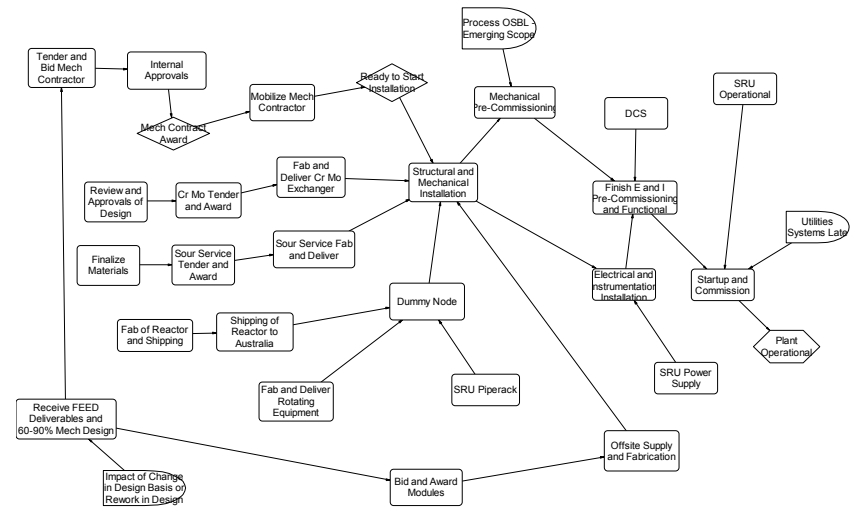
- Typical Status Quo
 - Detailed project schedule developed (often 1000’s of activities)
 - (or the other extreme, no project schedule)
 - Lack of project team alignment around the key elements of the schedule
 - Projects often finish late – and time is money!
 - “p50” planning leads to low chance of meeting target if multiple workstreams are required
 - chance of all workstreams meeting or beating their p50 dates is low

DA techniques can add huge value via Schedule Risk Analysis

STEP 1: Boil the detail schedule down to a more strategic level



25-50 Key Activities



DA “lens” helps this process by focusing on key distinctions and groupings of activities

Systematically “Risking” the schedule identifies areas of risk (and opportunity).

STEP 2: Probability assessment of durations of key activities – and drivers

The diagram illustrates the project schedule with various activities and their dependencies. The 'Ready to Start Installation' node is highlighted as the focus of the assessment.

Assessments

Structural and Mechanical Installation

Assessments | Risk Management Plan

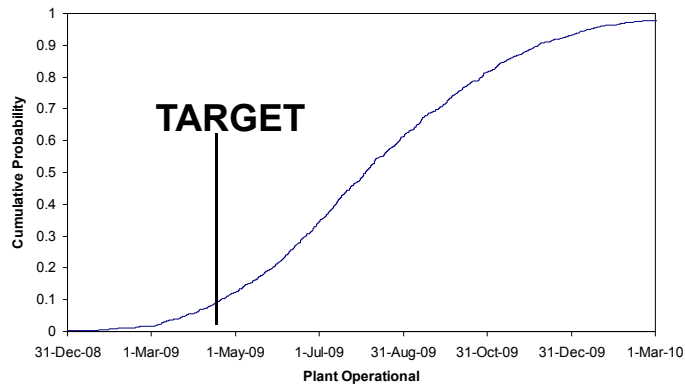
Start No Earlier Than: 08 Jan., 2007 | Assessments In: Months

	Low	Base	High
Duration	7	7	11
Probability (Optional)			
Distribution = Automatic			
Comments			High end driven by adverse weather, IR issues, and productivity relative to historic nomas
General Notes	Base is 7 months; single shift		
Weather Window	None	From 06 May, 2009	To 06 May, 2009
	<input type="checkbox"/> Apply For All Years		
Correlate	<input type="checkbox"/>		

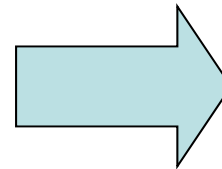
OK | Cancel

Results are used to drive the search for creative alternatives and mitigations.

STEP 3: Run probability model on high-level schedule model



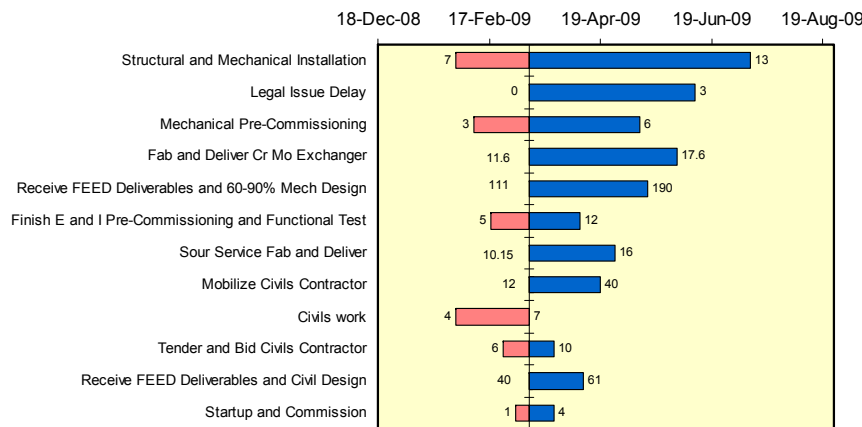
Search for acceleration options.



Example Acceleration Options

- Accelerate/mitigate mechanical engineering
- Tender/bid mechanical contract early
- Delegate bulks & module fab to contractor
- Sole source for major long leads
- Single SRU/DHTU Contractor
- Overseas labor / improved productivity
- Higher supervision ratio
- Site permitting / transportation

Plant Operational



DA can then support cost/benefit analysis around these opportunities.

STEP 4: Drive action based on analysis of options

	Impacts vs. Unmitigated (weeks)			Out of Pocket Costs
	p10	p50	p90	
Accelerate/mitigate mechanical engineering	-2.1	-2.1	-4.1	\$ 40
Tender/bid mechanical contract early	-3.9	-4.3	-6.3	\$ 20
Delegate bulks & module fab to contractor	0.0	0.0	-0.4	\$ 15
Sole source for major long leads	-1.4	-0.9	0.0	\$ 10
<i>Single SRU/DHTU Contractor</i>	<i>-0.7</i>	<i>-1.3</i>	<i>-3.4</i>	<i>\$ 5</i>
<i>Overseas labor / improved productivity</i>	<i>-0.7</i>	<i>-1.3</i>	<i>-3.4</i>	<i>\$ 10</i>
<i>Higher supervision ratio</i>	<i>-1.0</i>	<i>-1.6</i>	<i>-3.6</i>	<i>\$ 15</i>
<i>Site permitting / transportation</i>	<i>-0.6</i>	<i>-0.9</i>	<i>-1.9</i>	<i>\$ 25</i>

Results lead to new alternatives, different decisions in project execution, faster schedules and higher project team alignment.

Two Examples

- DA Used to Accelerate Schedule

- Faster, More Efficient Decisions

For the vast number of 'routine decisions', Decision Analysis in its traditional form is not warranted

- Example 'Routine' Decisions – made dozens or more times each year
 - Product Entry into New Region
 - Small Capital Investment
 - Repair / Replace
 - Etc.
- Typical Status Quo
 - No analysis, or, at best, a variety of 'home grown' approaches on different people's desktop
 - No uniform approach
 - **Time wasted:**
 - **Developing justification each time**
 - **Executives comparing disparate requests**

Decision Analysis, deployed creatively, can improve the speed, efficiency and quality – of these recurring decisions.

STEP 1: Frame and structure the decision one – in generic form

- Alternatives
- Key Input Variables
 - Limited to 10-20
 - .
- Analytic Model
- Standardized Metrics, Outputs and Sensitivities

Step 2: Create common decision models with easy user interfaces, and make them available broadly.

- Read only Excel files on common server
 - Simple, easy to implement
- Web-based systems
 - Low-cost, with additional database features

Step 2: Capture the specific input data needed for that particular decision...

Input: abc
[Save](#) [Save and Analyze](#) [Discard Changes](#)

General Risk Factors Trouble-Free Minor Trouble Significant Trouble Serious Trouble

Reliable Offset Logs?
How available and pertinent are offset logs? None

Offset Bit Records
Describe the availability of offset bit records. None

Pore Pressures
Describe the availability of recent and pertinent pore pressures in potentially productive pay intervals. None

Operating Window
Describe the pore pressure vs. mud width vs. frac gradient operating window. Very Tight

Transition Points Understood?
Are abnormal transition points and casing seat points well understood? No

Site Issues
Describe the understanding of ROW and site construction issues. Poor

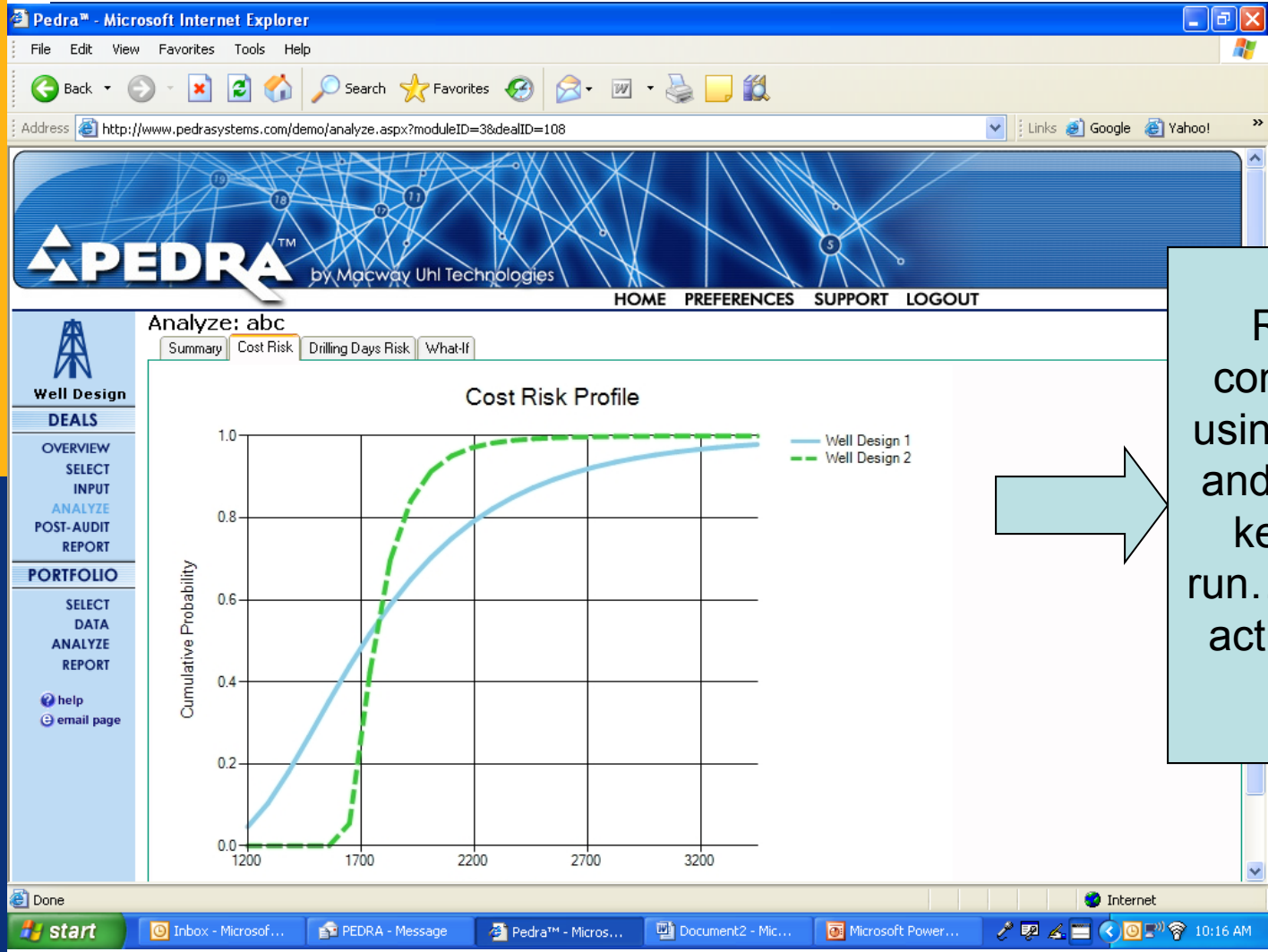
Less than 1 miles from salt dome?
No

Risk Factors are the qualitative issues that most often affect the likelihood of encountering various types of trouble.

These questions serve as a useful checklist for thinking about risk issues, and consideration of these issues ought to inform your assessments of risk on the following pages.

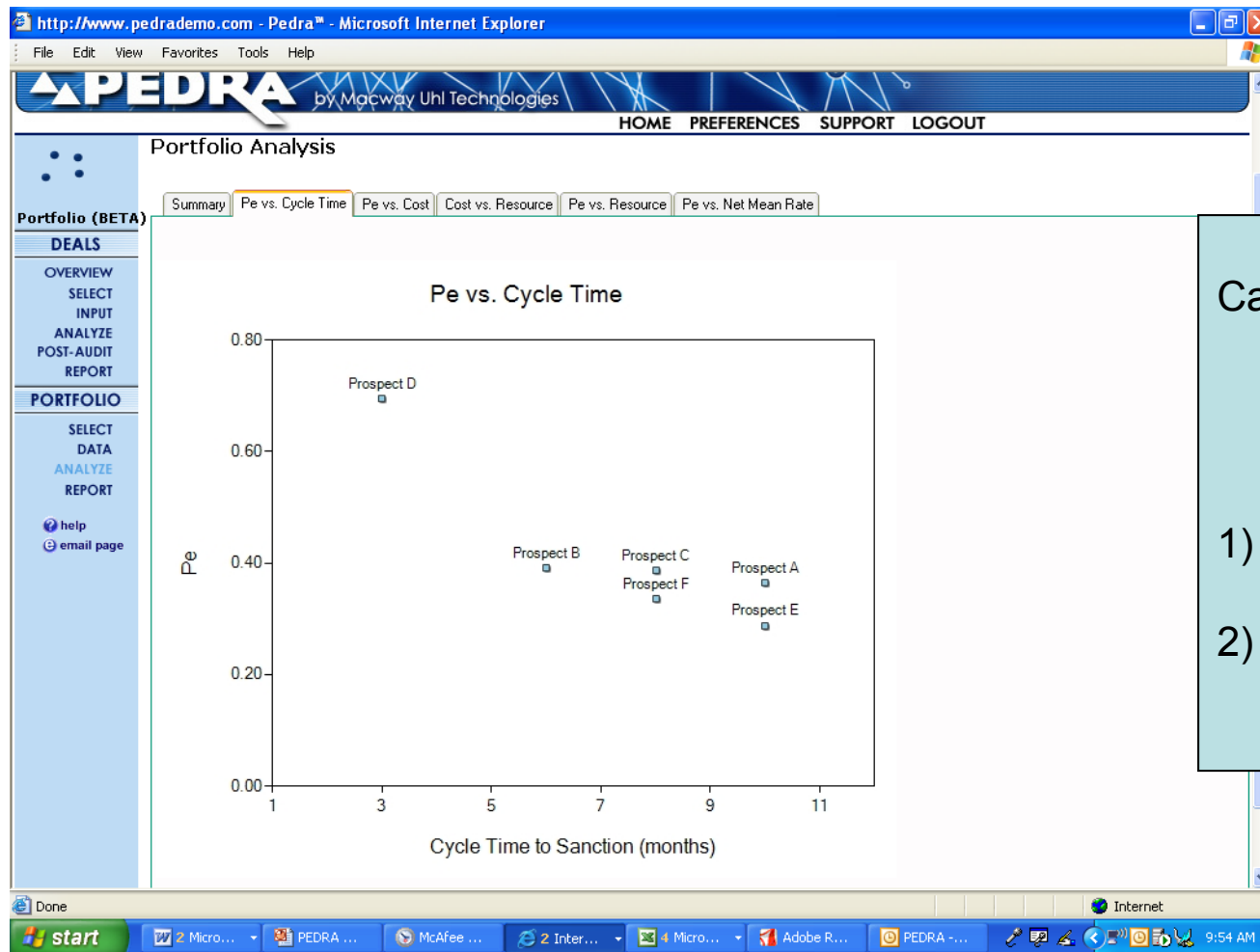
Simple sets of inputs, well documented, accessible and usable to owners of each decision.

Step 3: Capture the specific input data for decisions as needed...and use the standardized results to drive action.



Results are in consistent format, using common logic and approach, with key sensitivities run....leads to quick action (rather than iteration....)

Step 4: Capturing data around large number of similar decisions leads to continuous learning and improvement.



Capturing data around many decisions of similar structure enables:

- 1) Virtual peer reviews
- 2) Easy 'look backs'

For More Information

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