



Automated Cost Estimating Integrated Tools

Getting Started with JACS

ACEIT Users Workshop
September 18-19, 2012
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Tecolote Research, Inc.





Getting Started with JACS

- **Brief overview of JACS**

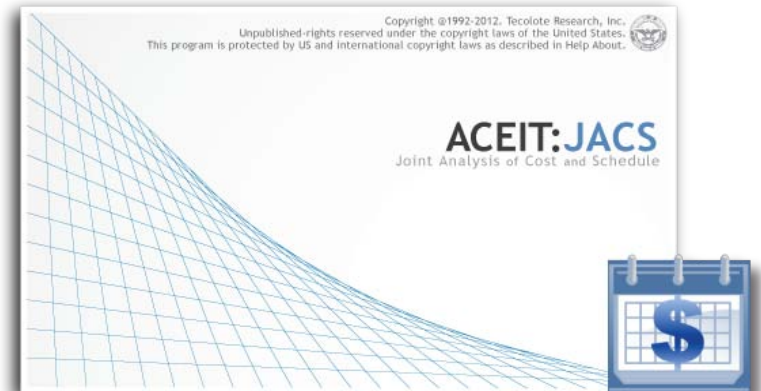
- **Data needed to run JACS**
 - Analysis Schedule
 - Time Independent and Time Dependent Costs
 - Entering Uncertainty and modeling Discrete Risks



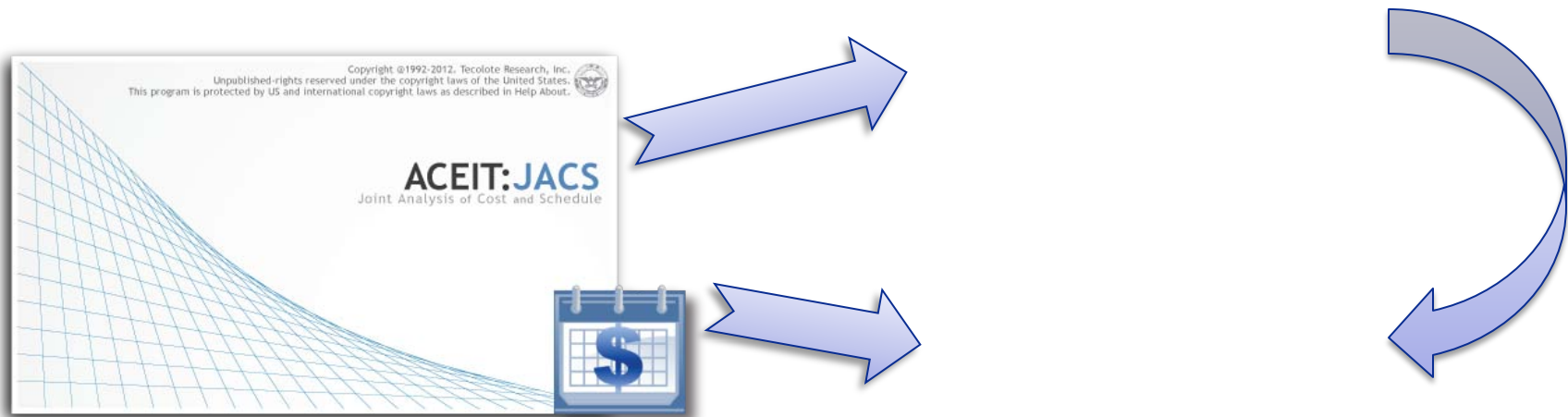
JACS Overview



- **Joint Analysis Cost and Schedule** is an add-in for Microsoft Project designed to quickly create probabilistic task details related to schedule and costs in an integrated schedule
 - Enables the assignment of costs to a schedule task
 - Easily define uncertainty distributions for costs and/or schedule durations
 - Provides the user with a quick way to assign and model a multitude of discrete risks within a project
 - Input data stored within custom columns in Microsoft Project – ***Open and Visible to the user***



- The JACS tool exists as a menu item in Microsoft Project
- Uses the Automated Cost Estimator (ACE) engine from the ACEIT 7.3 software suite to run the RI\$K calculation in the background
- Results are shown within Microsoft Project and graphically through the ACEIT Scatter-plot Observation Tool (ASPOT)

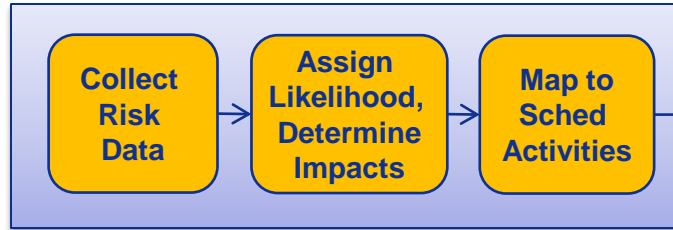
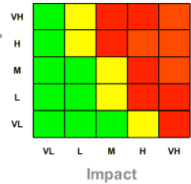




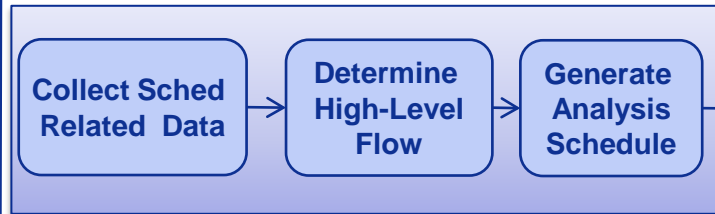
The Complete JACS Modeling Process (from the "Introducing JACS!" session)

Risk

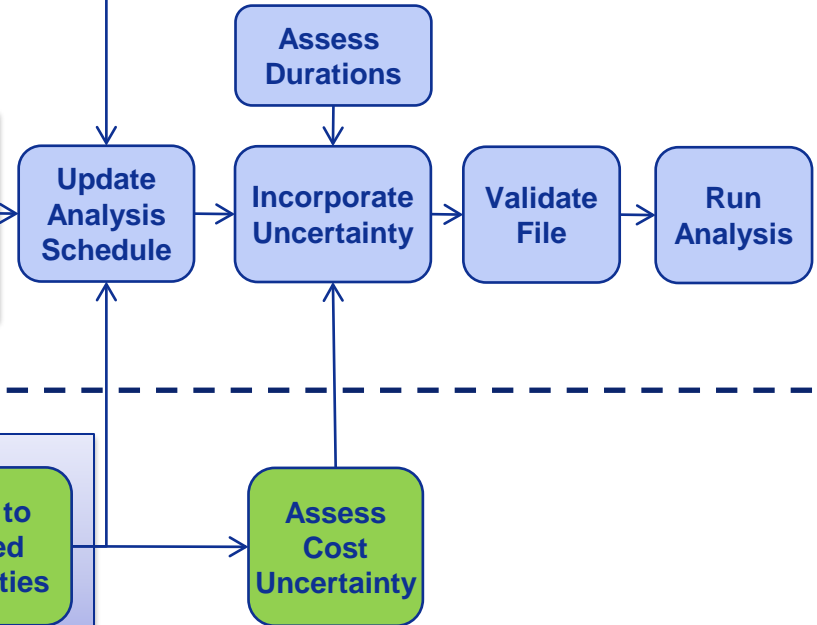
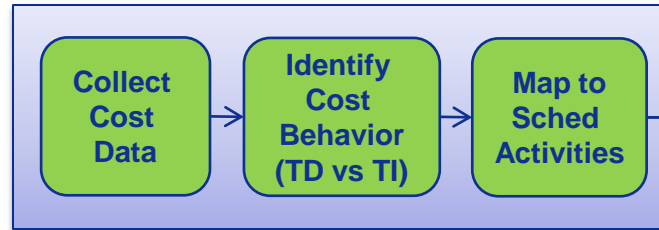
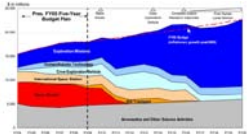
RISK MATRIX



Sched



Cost





What do I need to run JACS?





What do I need to run JACS?

ANALYSIS SCHEDULE



What is an “Analysis Schedule”?

- **Different than an IMS or a detailed schedule, its objective is to enable a modeling and simulation environment**
- **Displays major work-flows of a project**
- **Identifies work required to support major deliverable / tracking items**
- **Has traceability and transparency to more detailed IMS and schedule products**



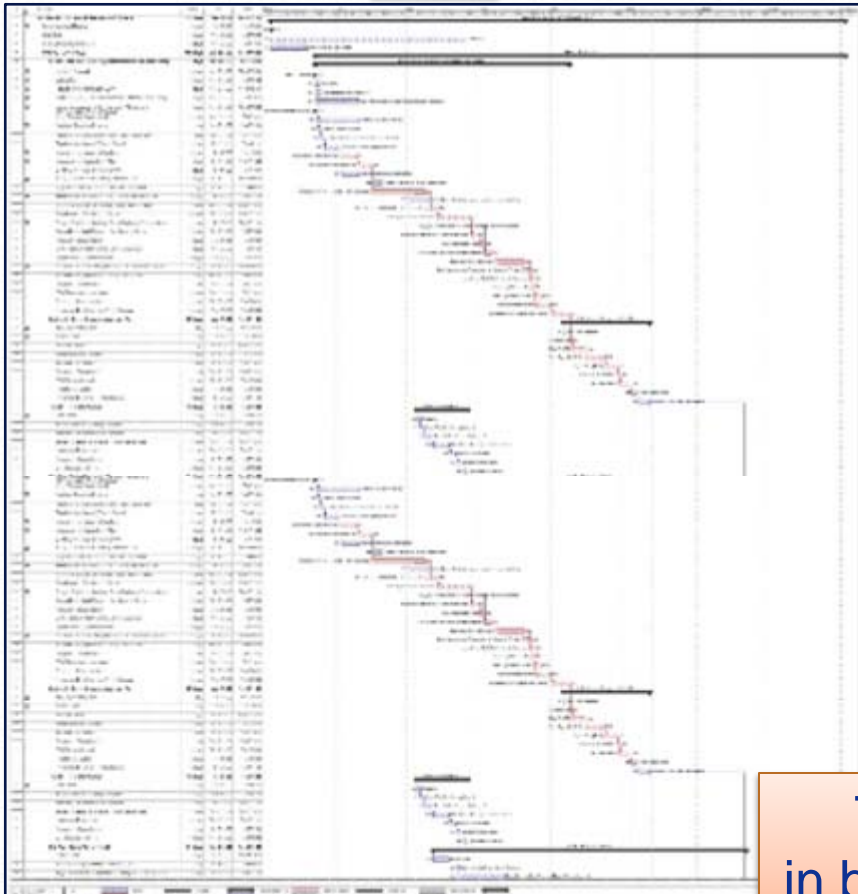
Don't you mean a "Summary Schedule"?

■ Yes and No...

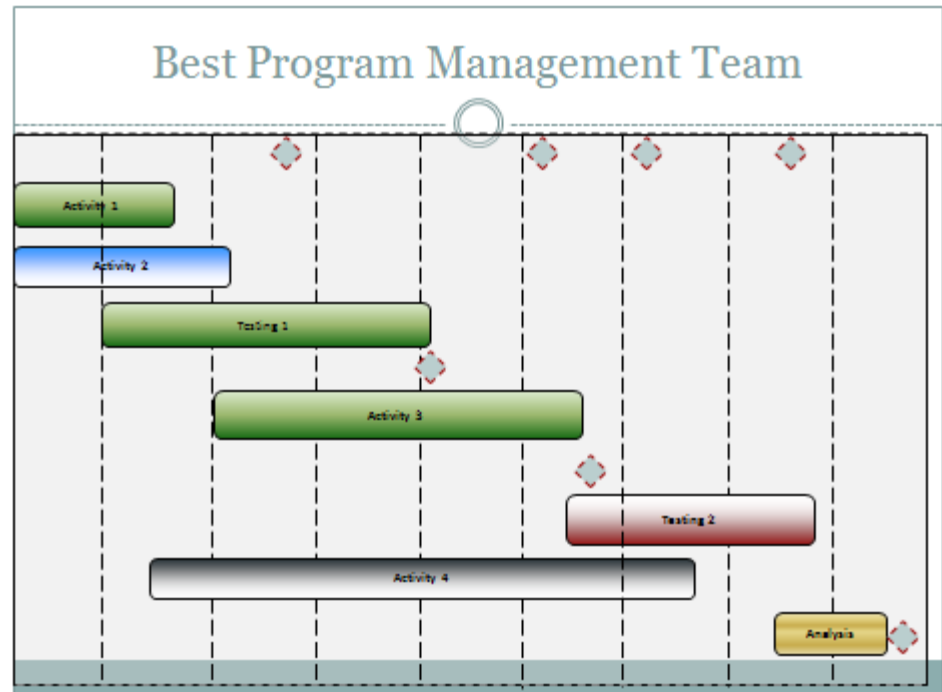
- **Analysis Schedule has a different objective - to enable a modeling and simulation environment**
 - Structured around management/ budget responsibility
 - Enables alignment & allows linkage of budgeted work effort to schedule scope
 - Provides insight into major cross dependencies within or across management responsibility boundaries
 - Creates a solid framework for incorporating cost / schedule uncertainties and discrete risk events
 - Does not focus on detailed step by step work items or on describing the specific detailed task flow for critical paths

Why not use an IMS?

IMS



How Project is *really* managed



The Analysis Schedule is somewhere in between the IMS and Milestone Schedule



Process for Building an Analysis Schedule

- 1. Review High Level Management Schedule to obtain insight on focus, grouping, milestones, breakouts**
- 2. Remove non-essential tasks for cost/uncertainty modeling and collapsing serial activities/groups**
- 3. Conduct second order summarization by focusing in on serial flow areas**
- 4. Analyze file for logic issues and work with project to find additional areas of summarization to develop final Analysis Schedule structure**
- 5. Implement Cost Hammocks to model LOE or High Level Costs**



Closing Remarks on the Analysis Schedule

- **An Analysis schedule should contain enough detail to:**
 - Capture and represent the effort of the program being modeled
 - Align and Load costs onto tasks or series of tasks
 - Model Discrete Risks and their impacted tasks

- **Doesn't generating an Analysis Schedule create a traceability nightmare?**
 - Use Microsoft Project's Custom Fields and Task Unique IDs to document the effort contained in the tasks in an Analysis Schedule



What do I need to run JACS?

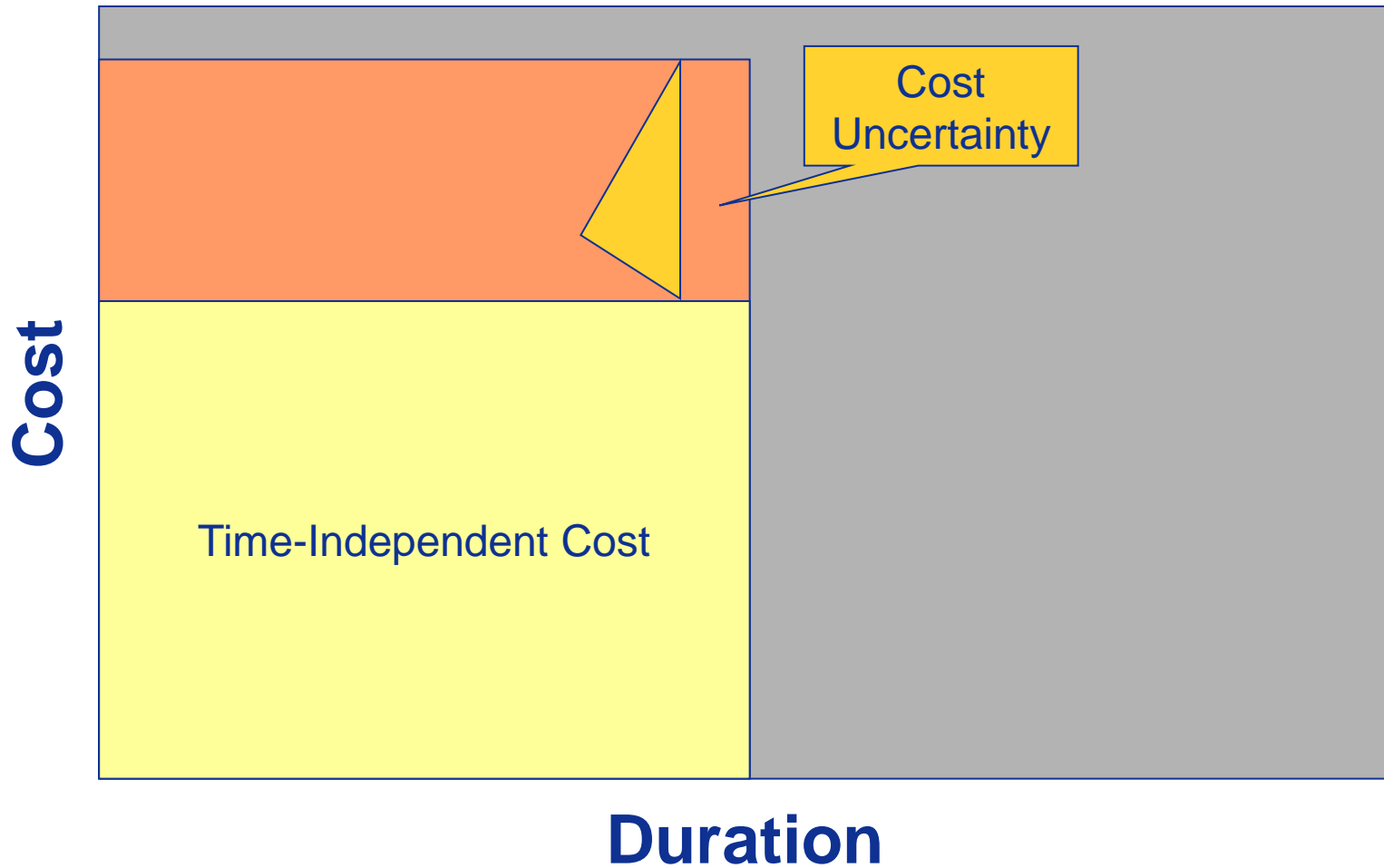
SEPARATE COST BEHAVIOR

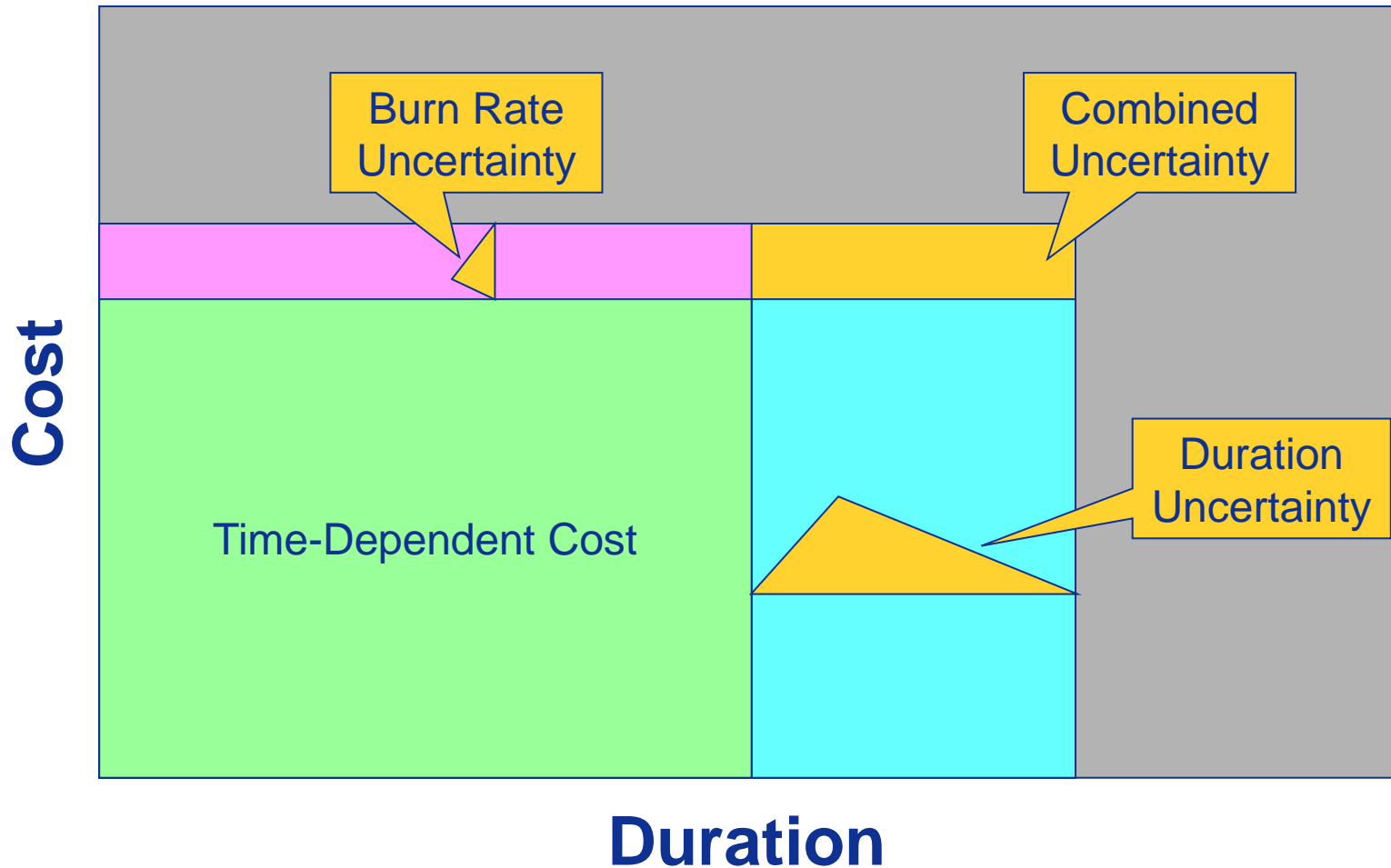


Time Independent & Time Dependent Costs

- **Time Independent costs are not impacted by the duration of the task they are loaded against**
 - The total cost remains the same and re-phased over the updated duration
 - Examples include: Materials, Purchases, etc.

- **Time Dependent costs are a function of the duration of the task which they are loaded against**
 - Total cost is calculated as “Rate X Duration”
 - Examples include: Marching Armies, LOE, etc.







Loading Costs in JACS

- **Time Independent and Time Dependent costs are defined separately on a task-by task basis**
 - User can select separate phasing profiles for Time Independent and Time Dependent costs

JACS Edit Form - JACS Quick Look Example.mpp

Current Task: 3 ---Air Vehicle (T1)

WBS: 1.1.1 Duration (days): 180 % Complete: 0 , w/ remaining: 180



Report Results Hammock Task Program Event

Spending Detail


Total Cost (\$): 9,900,000 , w/ remaining: 9,900,000


Time-independent portion of task cost	Time-dependent portion of task cost
TI (\$): 4,400,000	TD (\$): 5,500,000
TI as % of Total Cost: 44.44	TD as % of Total Cost: 55.56


TD Burn Rate (€/workday): 30556

Spending Contour: Early Peak  Spending Contour: Flat 

Task Uncertainty


Duration Uncertainty  Tri*(90,100,125, 10, 90);Correl(Manu=0.75)

TI Cost Uncertainty 

TD Cost Uncertainty 

Selected Uncertainty

None | Normal | LogN | Triangle | PERT | Uniform | Constant | Discrete

 Low: 90 % chance below low: 10

Most Likely: 100

High: 125 % chance below high: 90

Defined as percentages of baseline (100%=BL)

Correlation Grouping: MANU Shared Coef: 0.75

Is risk event with likelihood (%) of: 0 Threat ID: Occurs

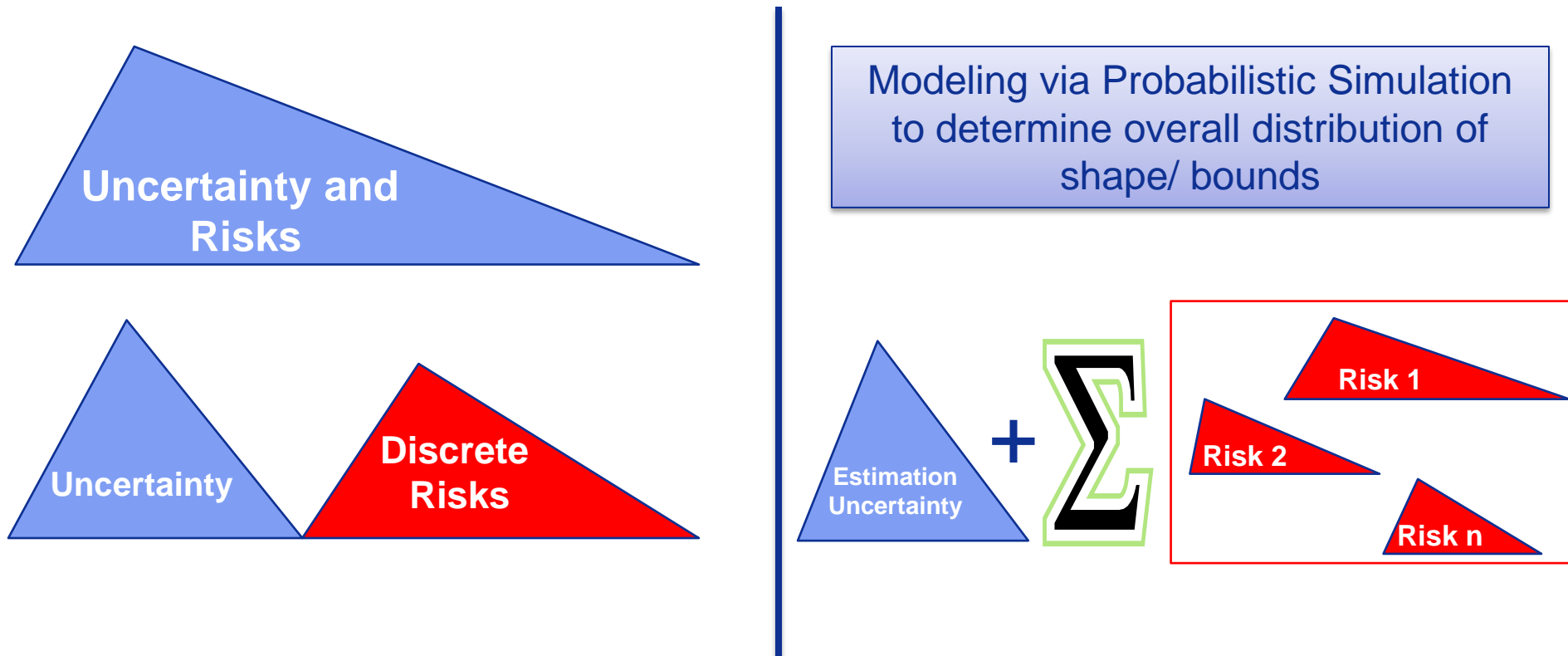
Always on top



What do I need to run JACS?

UNCERTAINTY AND RISK

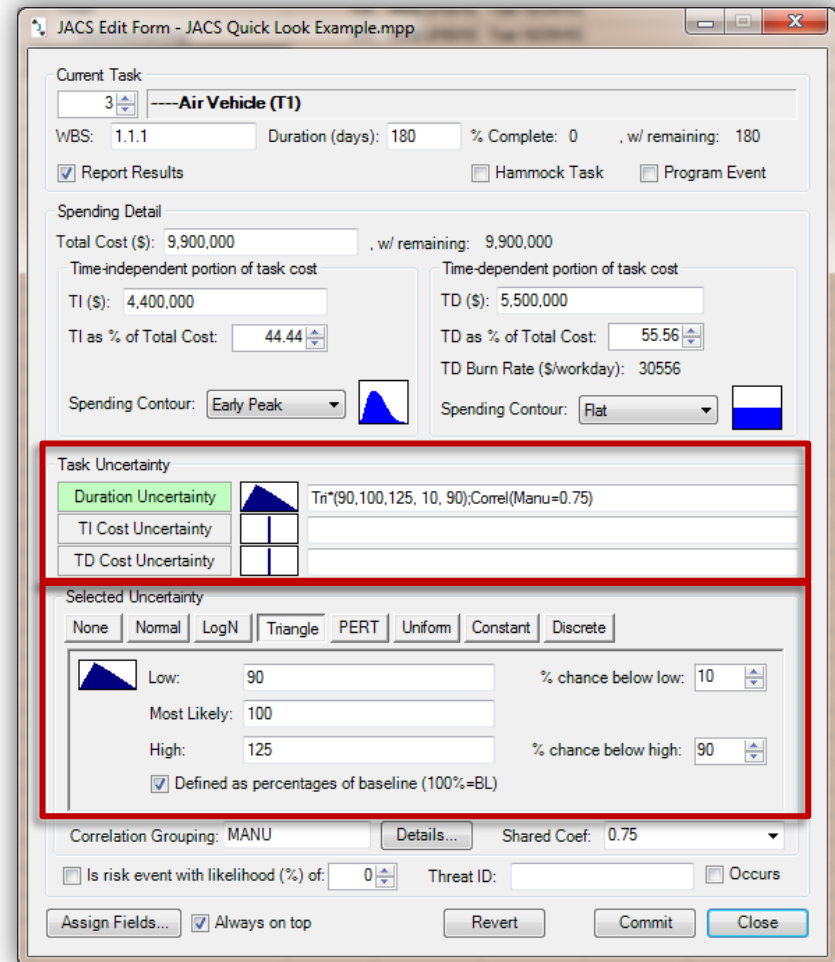
- **JACS can model Uncertainty and Risks separately in order to assess the individual impacts to the project**
 - Uncertainty is the indefiniteness about the outcome of a situation
 - Risk is an event with an impact



■ **With JACS, the user can define uncertainty for:**


- Duration
- Time Independent Costs
- Time Dependent Costs


■ **Selecting from a variety of uncertainty distributions**






JACS Edit Form - JACS Quick Look Example.mpp


Current Task
 3 ---Air Vehicle (T1)
 WBS: 1.1.1 Duration (days): 180 % Complete: 0 , w/ remaining: 180
 Report Results Hammock Task Program Event

Spending Detail
 Total Cost (\$): 9,900,000 , w/ remaining: 9,900,000
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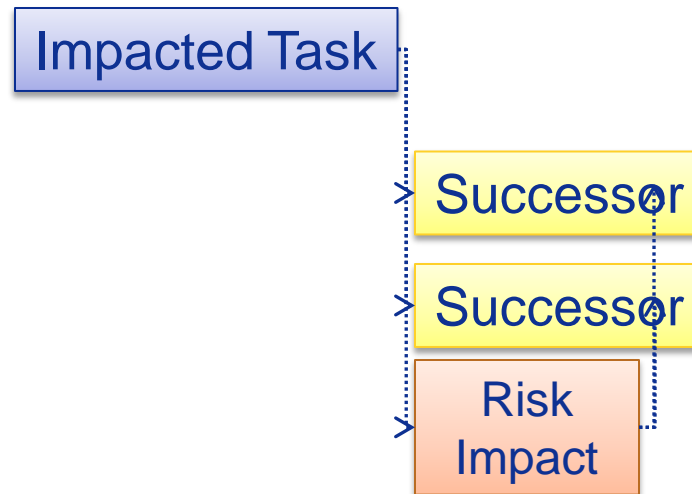
Task Uncertainty
 Duration Uncertainty  Tr*(90,100,125, 10, 90);Correl(Manu=0.75)
 TI Cost Uncertainty 
 TD Cost Uncertainty 

Selected Uncertainty

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 Most Likely: 100
 High: 125 % chance below high: 90
 Defined as percentages of baseline (100%=BL)

Correlation Grouping: MANU Shared Coef: 0.75
 Is risk event with likelihood (%) of: 0 Threat ID: Occurs
 Always on top

- **Discrete Risks are events that, when they occur, have an impact to the cost and/or duration of a task within the project**
- **In JACS, Discrete Risks are modeled as *Zero-Baseline Duration/Cost tasks (milestones)***
 - This method prevents the Discrete Risk from impacting the baseline values of the schedule until a risk simulation is performed
 - The Discrete Risk must be linked into the schedule using predecessor/successor logic





Discrete Risk Parameters

- Once the Discrete Risk is linked into the Microsoft Project schedule, the user can define the impact in the JACS Edit screen
 - Risk likelihood
 - Threat ID
 - Cost/duration impact via Task Uncertainty

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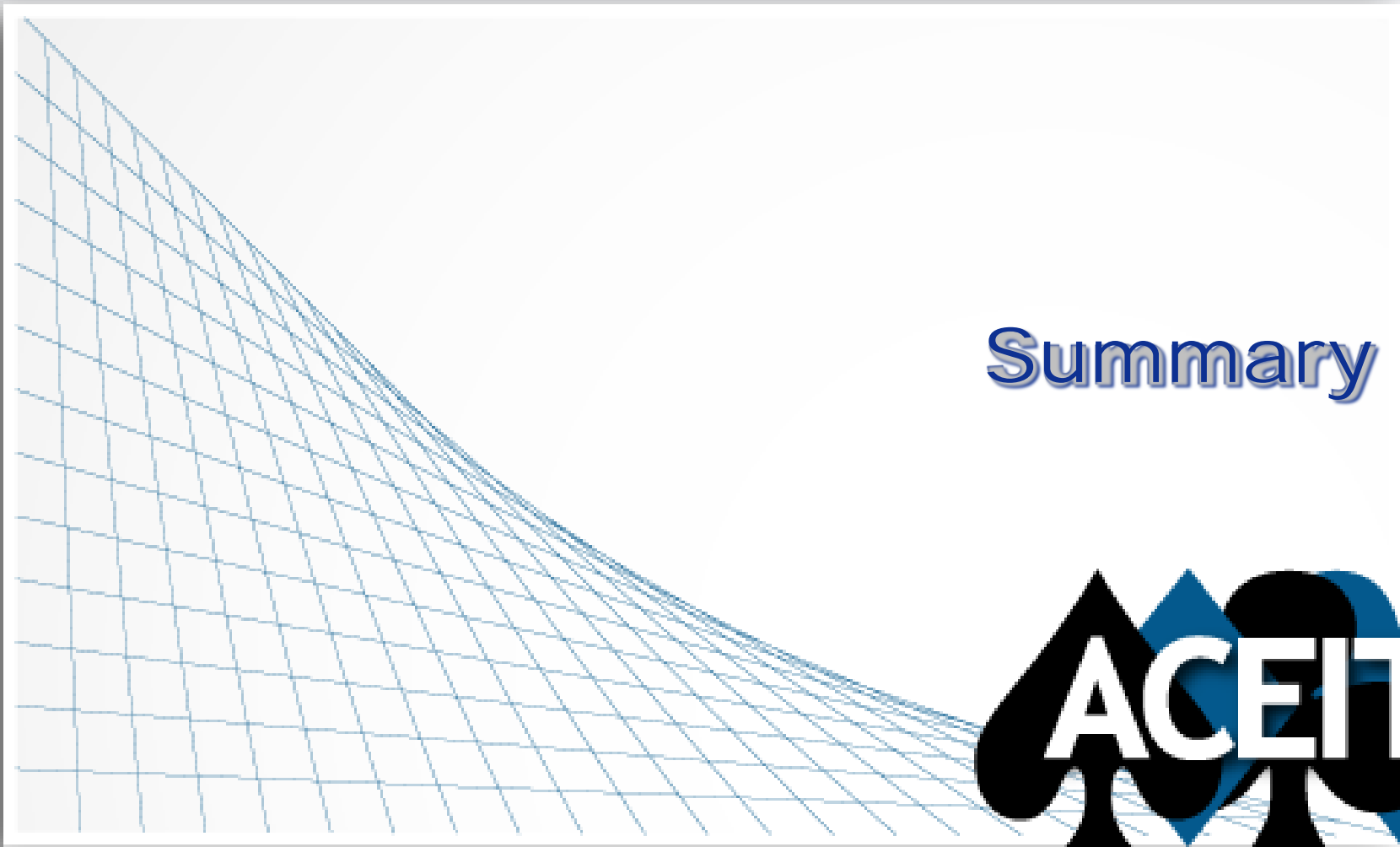
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 Defined as percentages of baseline (100%=BL)

Correlation Grouping: MANU Details... Shared Coef: 0.75
 Is risk event with likelihood (%) of: 0 Threat ID:
 Occurs
Assign Fields... Always on top Revert Commit Close





Getting Started with JACS

- **The main components of JACS are:**
 - Analysis Schedule in Microsoft Project
 - Costs split into Time Independent and Time Dependent behavior
 - Uncertainty defined for Durations, Time Independent costs, and Time Dependent costs
 - Discrete Risks modeled into Microsoft Project and quantified impacts identified

- **Be sure to attend John Sandberg's session on Wednesday titled “**So You Want To Play With JACS, Huh?**” to get a glimpse into editing the data and generating results in JACS**



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THANK YOU!