Automated Cost Estimator (ACE) Overview

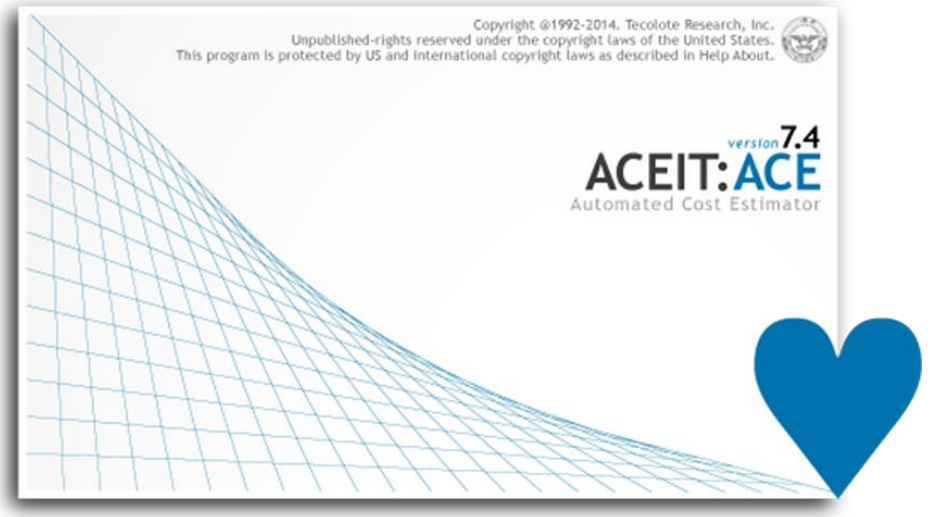
Version 7.4

April 2014

Tecolote Research, Inc.

ACE is an Estimating Platform

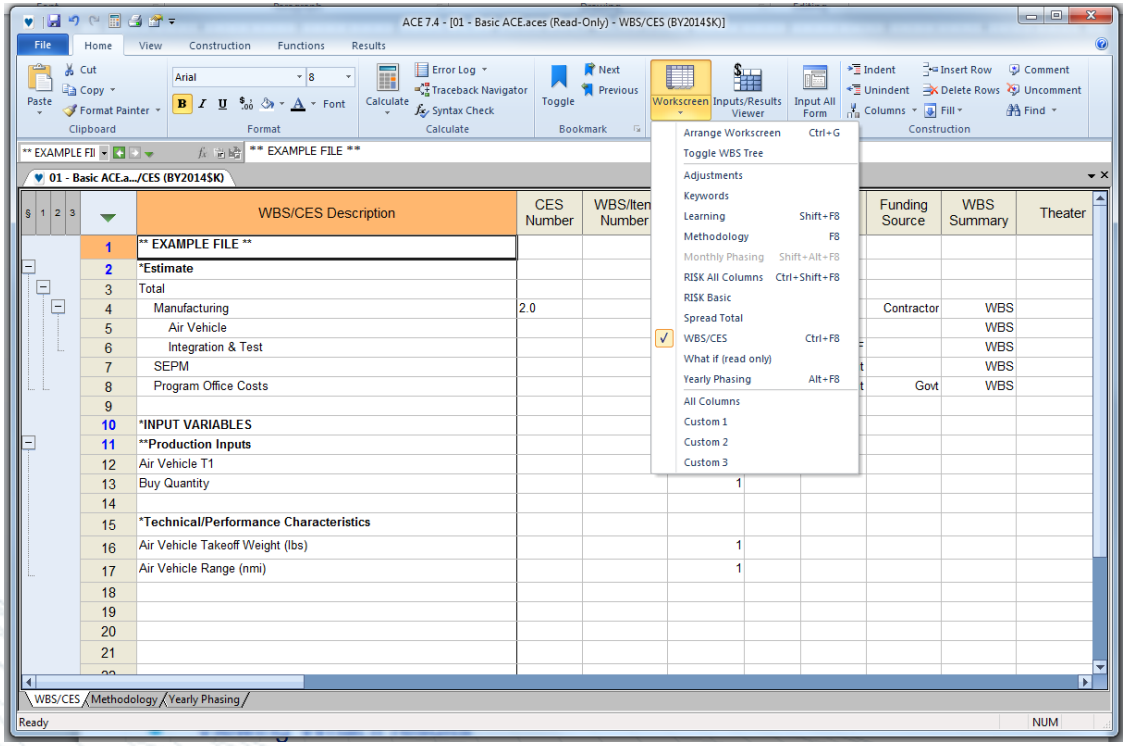
- **What is ACE?**
  - Framework to build models
  - Calculation engine to compute/process information
- **ACE files (sessions) contain user-developed cost estimate**
  - Methodology
  - Documentation
  - Inputs
  - Integrated uncertainty analysis



Create risk adjusted, integrated cost/schedule life cycle estimates for any project!

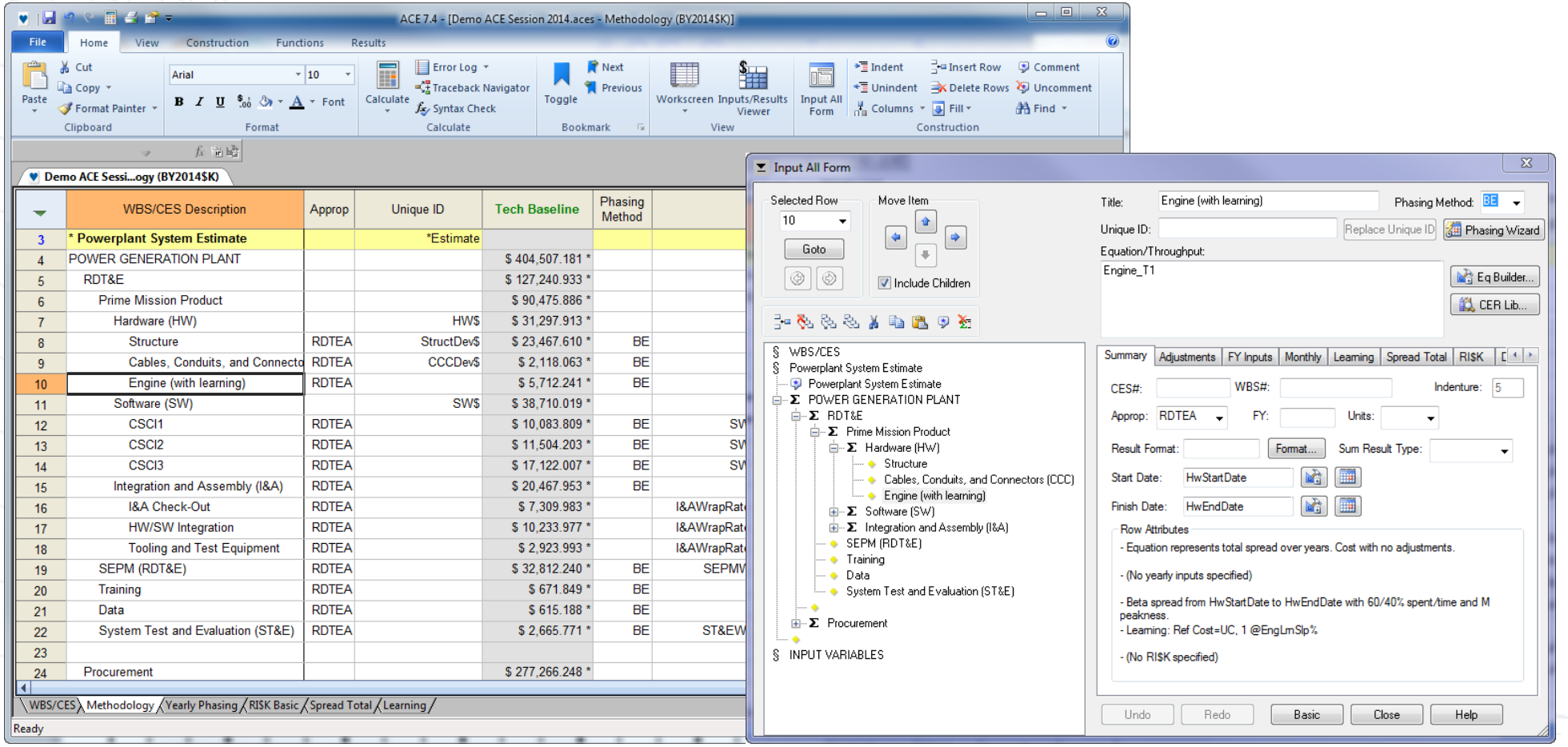
Workscreens Provide a Filtered View of an ACE Session

- **Each workscreen shows only the relevant fields supporting specific functions involved in building a cost estimate**
  - Building a WBS/CES
  - Implementing methodologies
    - Adjusting for FY, dollar units, Fee, Overhead, G&A
    - Applying learning curve theory
    - Time phasing the estimate (Annual and Monthly)
    - Incorporating a risk analysis
  - Viewing What if results
  - Entering documentation



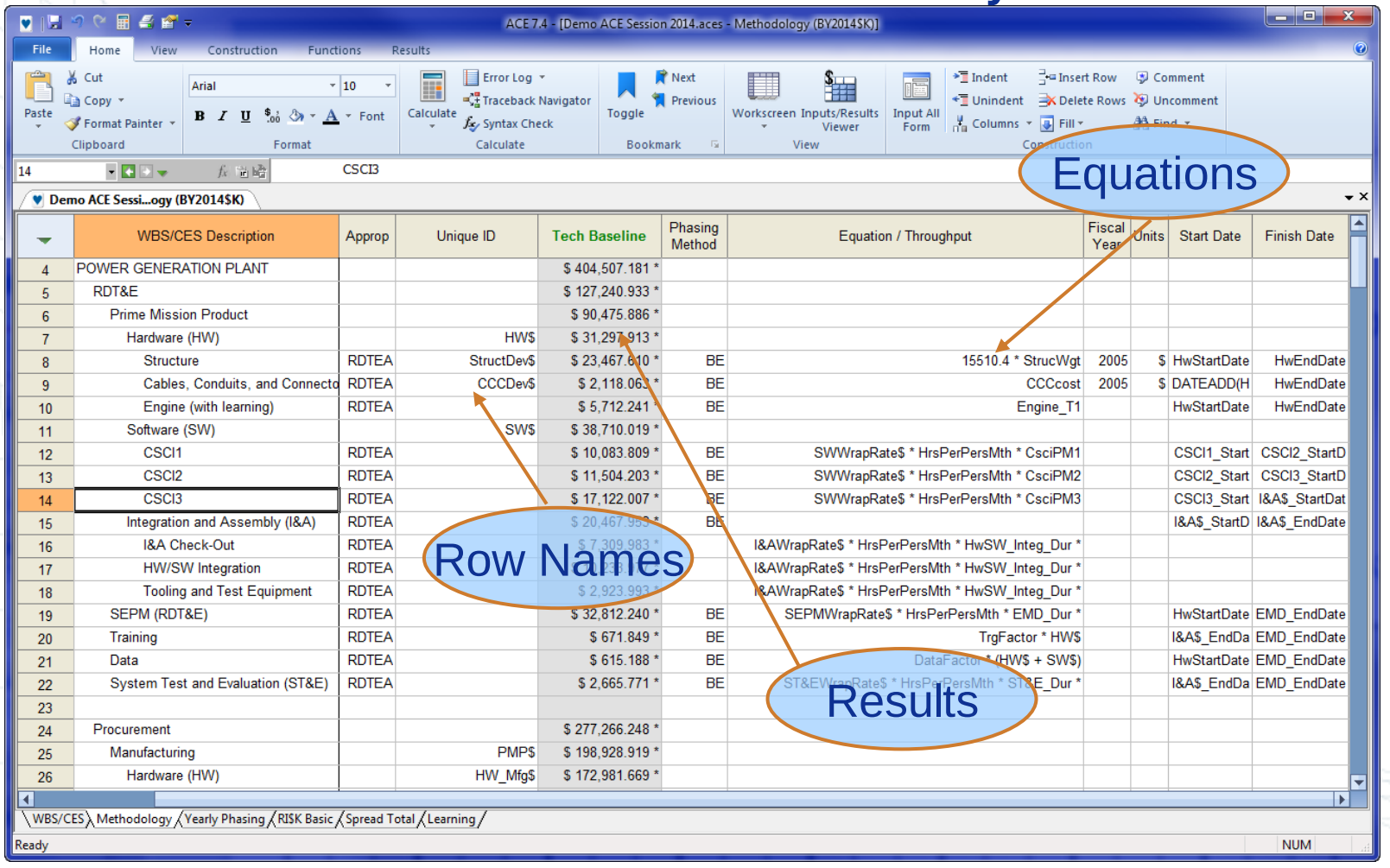
Results are Automatically Summed Based on Element Hierarchy

- **ACE uses an indenture structure to sum elements, thereby ensuring proper calculation**
  - Add/remove elements when the WBS changes without need to redo summing equations
- **Tools available to simplify navigation and data entry**



Equations / Data Entered into Specific Fields

- Specific columns are used to enter equations and annual data
- Data is referenced by naming of rows / columns by Unique IDs
- All data used for the estimate is immediately visible



	WBS/CES Description	Approp	Unique ID	Tech Baseline	Phasing Method	Equation / Throughput	Fiscal Year	Units	Start Date	Finish Date
4	POWER GENERATION PLANT			$ 404,507.181 *						
5	RDT&E			$ 127,240.933 *						
6	Prime Mission Product			$ 90,475.886 *						
7	Hardware (HW)		HW$	$ 31,297.913 *						
8	Structure	RDTEA	StructDev$	$ 23,467.610 *	BE	15510.4 * StrucWgt	2005	$	HwStartDate	HwEndDate
9	Cables, Conduits, and Connecto	RDTEA	CCCDev$	$ 2,118.063 *	BE	CCCcost	2005	$	DATEADD(H	HwEndDate
10	Engine (with learning)	RDTEA		$ 5,712.241 *	BE	Engine_T1			HwStartDate	HwEndDate
11	Software (SW)		SW$	$ 38,710.019 *						
12	CSCI1	RDTEA		$ 10,083.809 *	BE	SWWrapRate$ * HrsPerPersMth * CsciPM1			CSCI1_Start	CSCI2_StartD
13	CSCI2	RDTEA		$ 11,504.203 *	BE	SWWrapRate$ * HrsPerPersMth * CsciPM2			CSCI2_Start	CSCI3_StartD
14	CSCI3	RDTEA		$ 17,122.007 *	BE	SWWrapRate$ * HrsPerPersMth * CsciPM3			CSCI3_Start	I&A$_StartDat
15	Integration and Assembly (I&A)	RDTEA		$ 20,467.953 *	BE				I&A$_StartD	I&A$_EndDate
16	I&A Check-Out	RDTEA		$ 7,309.983 *		I&AWrapRate$ * HrsPerPersMth * HwSW_Integ_Dur *				
17	HW/SW Integration	RDTEA		$ 10,233.976 *		I&AWrapRate$ * HrsPerPersMth * HwSW_Integ_Dur *				
18	Tooling and Test Equipment	RDTEA		$ 2,923.993 *		I&AWrapRate$ * HrsPerPersMth * HwSW_Integ_Dur *				
19	SEPM (RDT&E)	RDTEA		$ 32,812.240 *	BE	SEPMWrapRate$ * HrsPerPersMth * EMD_Dur *			HwStartDate	EMD_EndDate
20	Training	RDTEA		$ 671.849 *	BE	TrgFactor * HW$			I&A$_EndDa	EMD_EndDate
21	Data	RDTEA		$ 615.188 *	BE	DataFactor * (HW$ + SW$)			HwStartDate	EMD_EndDate
22	System Test and Evaluation (ST&E)	RDTEA		$ 2,665.771 *	BE	ST&EWrapRate$ * HrsPerPersMth * ST&E_Dur *			I&A$_EndDa	EMD_EndDate
23										
24	Procurement			$ 277,266.248 *						
25	Manufacturing		PMP$	$ 198,928.919 *						
26	Hardware (HW)		HW_Mfg$	$ 172,981.669 *						

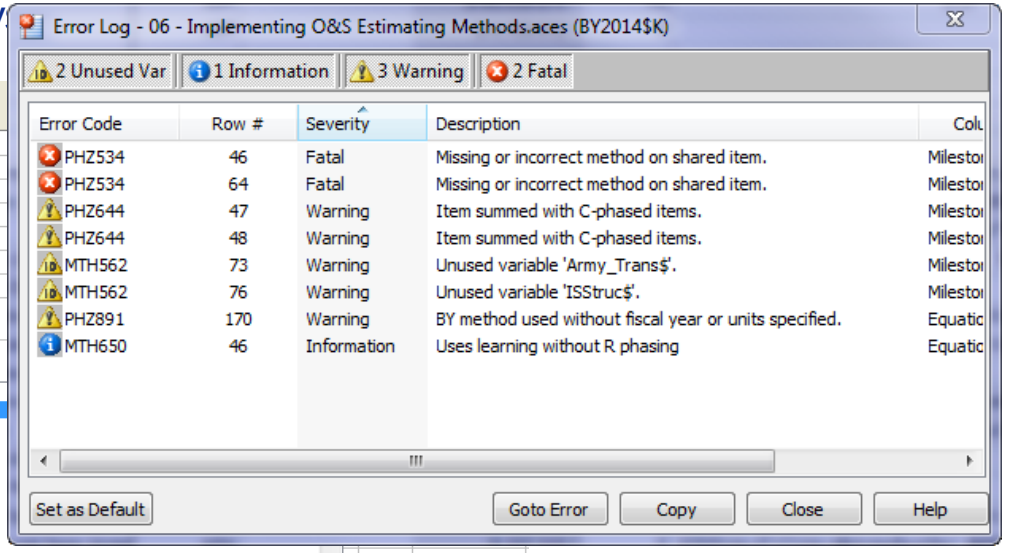
Standard Methods / Techniques to Ensure Reliable Calculations

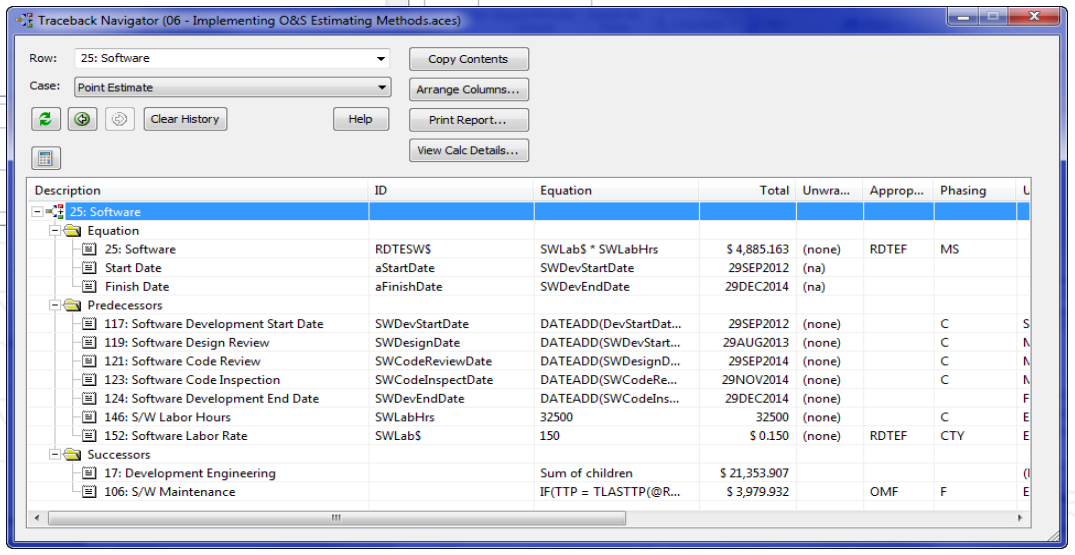
- Integrated inflation indices to correctly normalize results and develop annual outlays

	WBS/CES Description	Approp	Unique ID	Point Estimate	Phasing Method
7	*Estimate		*Estimate		
8	Total			$ 890,755.722 *	
9	RDT&E		RDTE$	$ 64,063.575 *	
10	Concept Refinement			$ 1,034.093 *	
11	Contractor A	RDTEF		$ 519.046 *	TY
12	Contractor B	RDTEA		$ 515.048 *	TY
13	Technology Development			$ 4,604.018 *	
14	Contractor A	RDTEF		$ 2,302.009 *	TC
15	Contractor B	RDTEA		$ 2,302.009 *	TS
16	System Development and Demonstration				
17	Development Engineering				
18	Air Vehicle				
19	Basic Structure				
20	Navigation/Guidance				
21	Propulsion				
22	Ground Station				
23	Procure OTS Parts				
24	Design New Parts				
25	Software				
26	Int & Assy				
27	Prototype Manufacturing			$ 3,206.330 *	
28	Air Vehicle	RDTEF		$ 2,855.320 *	BE
29	Mobile Ground Station	RDTEA		$ 351.010 *	BE
30	SEPM			$ 20.812 *	

RDTEF	AIR FORCE	Rsch, Dev, Test & Eval	
RDTEA	ARMY	Rsch, Dev, Test & Eval, Army	
APF	AIR FORCE	Aircraft Procurement	
APA	ARMY	Aircraft Procurement, Army	
OMF	AIR FORCE	O&M - Non-Pay, Non-POL	
MPF	AIR FORCE	Military Personnel - Total	
MPA	ARMY	Military Personnel (Composite), Army	
OMA	ARMY	Operation & Maintenance, Army	
MIPF	AIR FORCE	Missile Procurement	
OPF	AIR FORCE	Other Procurement	
MCONF	AIR FORCE	Military Construction	
OMF_P	AIR FORCE	O&M - GS & WB Pay Only	
OMF_F	AIR FORCE	O&M - Fuel	
MPF_P	AIR FORCE	Military Personnel - Pay Base	
MPF_O	AIR FORCE	Military Personnel - Other Expenses	
MPF_R	AIR FORCE	Military Personnel - Retirement	
MCF_R	AIR FORCE	MILCON - AF Reserve	

- Logs to show potential estimate errors





- Tools to trace model logic

Built-in ACE Functions

- **ACE offers several types of built-in functions to automate relationships between elements in an ACE session:**
  - Mathematical
  - Date
  - Economic Analysis
  - Time Period (operate on specific yearly or monthly inputs or results)
  - ACE Specific
  - Inflation
  - Logic and Mathematical
  - Matrix
  - Operational Life
  - RI$K

Functions for specific cost estimating calculations

- Several functions automatically calculate common cost estimating operations
- For example, many cost elements are calculated based on the number of Operational Fielded Units in any given year. The OpFieldedUnits() function calculates operational fielded units in each year based on a buy schedule, fielding lag and life expectancy.

Example:

WBS/CES	UNIQUE ID	POINT ESTIMATE	EQ/ THROUGHPUT	PM	FY 2015	FY 2016	FY 2017	FY 2018
Fielded Units		96	OpFieldedUnits(@BQ,OpLife, LaginYears)	F				
*Inputs								
Procurement Units	BQ	24	[Input Throughputs]	IS	6	8	10	
Operational Life	OpLife	4	4	C				
Lag in Years	LagInYears	1	1	C				

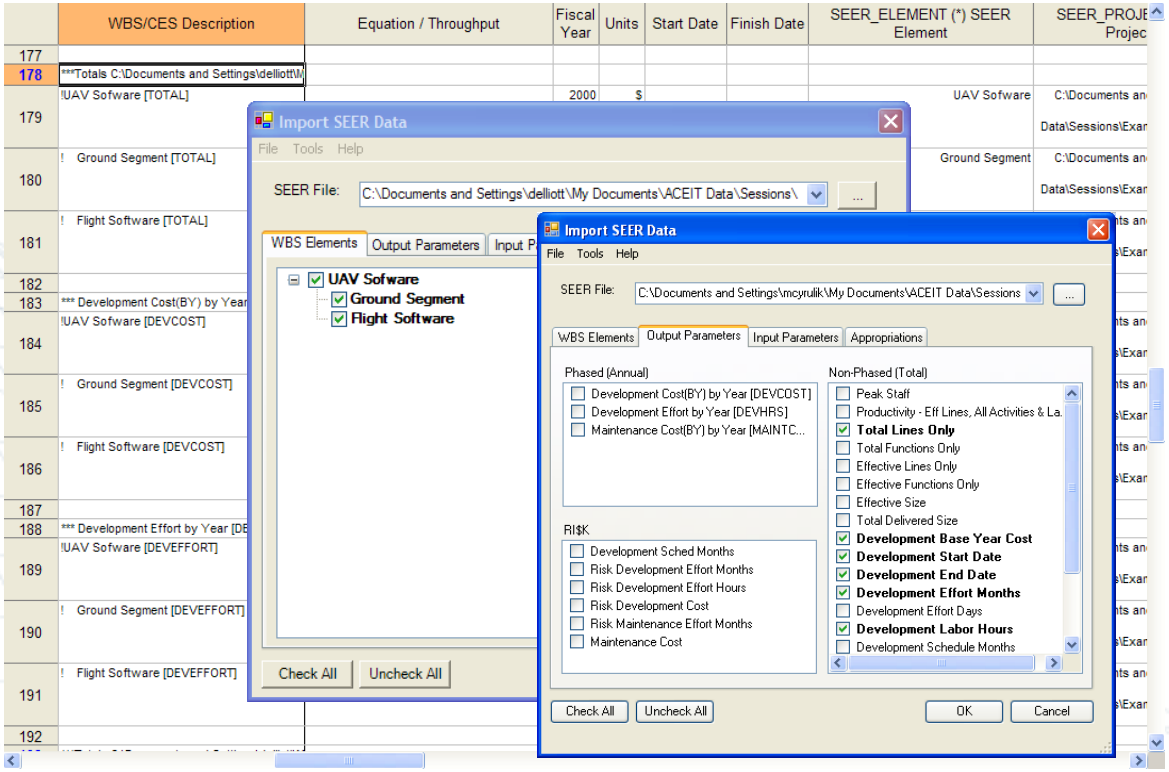
Results:

WBS/CES	POINT ESTIMATE	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021
Fielded Units	96		6	6+8=14	6+8+10=24	6+8+10=24	8+10=18	10

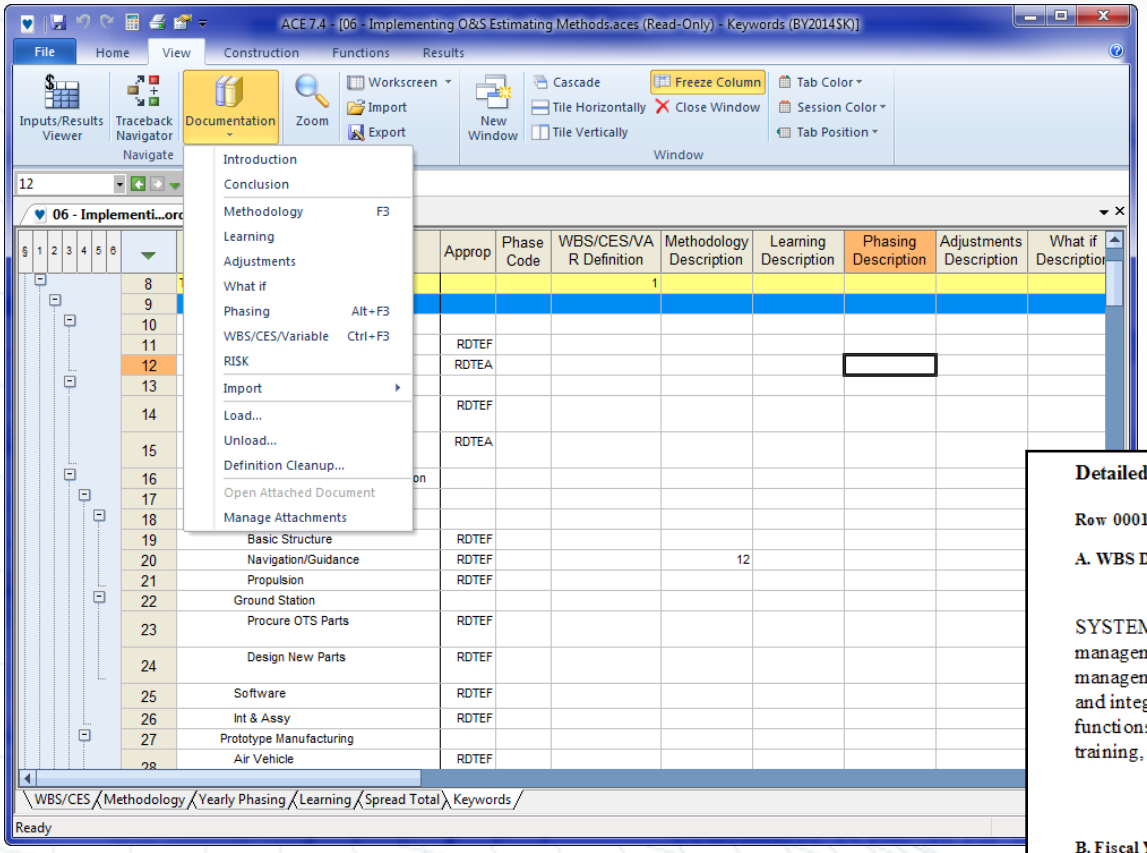
Open Platform Allows Integration with 3rd Party Applications

- **Multiple methods for integration with other applications**
  - Direct export to .rtf and.txt file formats
  - ACE results integrate with Excel through POST
  - ACE clipboard allows dynamic data export/import from/to an ACE session
  - ACE API enables
    - Ability to embed ACE sessions into other tools
    - Ability to create plug-ins that allow direct interaction inside ACE
- **Current ACE plug-ins**

  Getting data into ACE
  - ACE-to-ACE
  - Microsoft Excel
  - Microsoft Project
  - Price
  - SEER



Full Estimate Documentation Capability



- **Documentation can be imported via:**
  - RTF and MS Word files
  - Copy and Paste Commands
- **Documentation Available via:**
  - Input All Form
  - Narrative Report
  - MS-Word Document

Detailed Basis of Estimate

Row 00016 SEPM $ 27,065.488 FY 2006 $K

A. WBS Definition (ID: 5)

SYSTEM ENGINEERING/PROGRAM MANAGEMENT - The system engineering/program management element refers to integration of the system from a technical and business management control standpoint. This element encompasses the planning, directing, controlling, and integrating the definition, development and production of the system/program including the functions of logistics and logistics support, maintenance support, facilities, personnel and training, and testing and activation of a system.

B. Fiscal Year Phasing Results (FY2006 $K)

FY2005	FY2006	FY2007	FY2008	FY2009	Total
$3,866.5	$3,866.5	$7,733.0	$7,733.0	$3,866.5	$27,065.5

C. Estimating Methodology (Equation/Throughput Calculated Yearly and Summed)

0.37 * PMP$

C.1. Methodology Rationale (ID: 9)

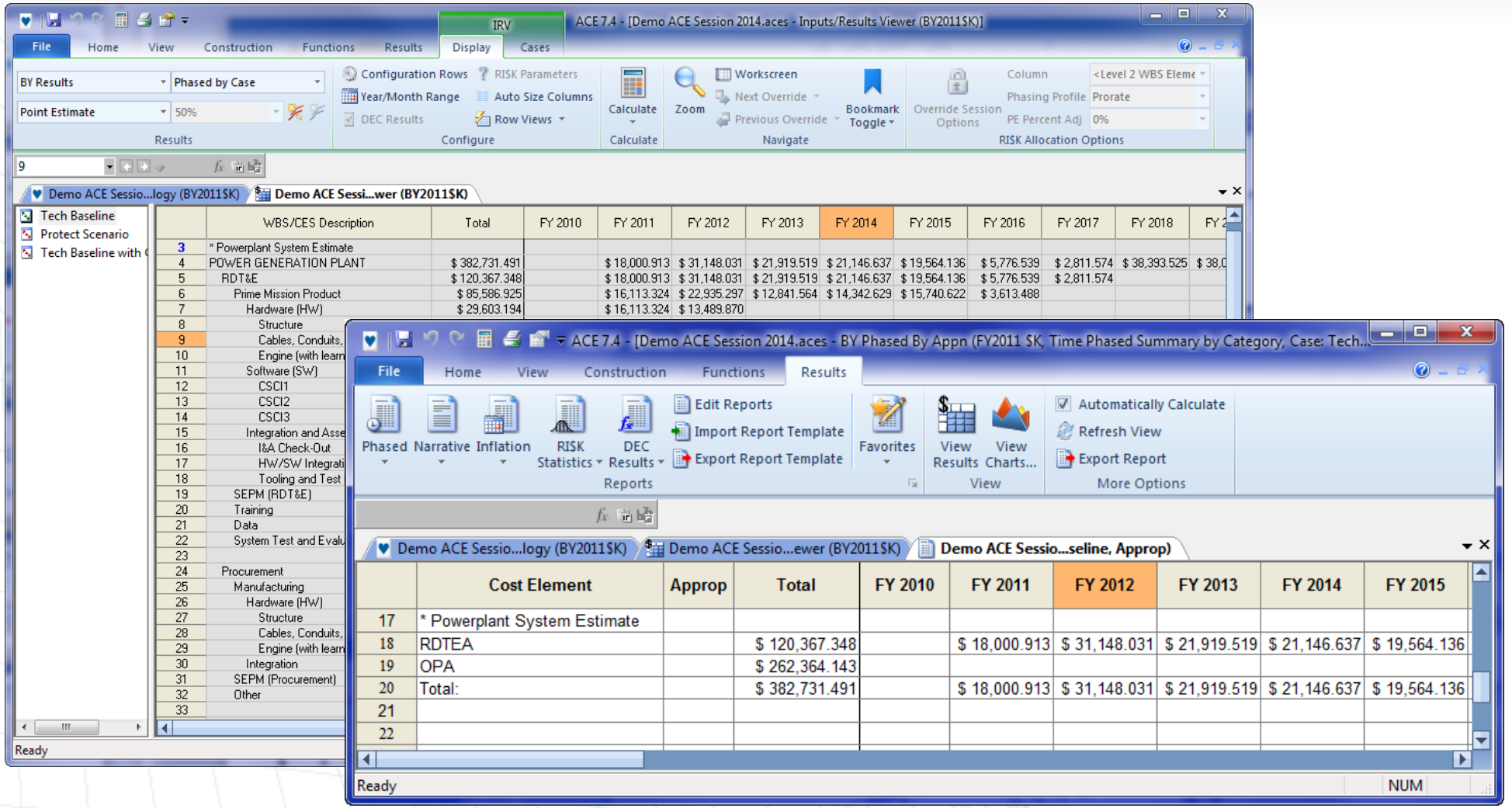
DEVELOPMENT COST FACTOR - System/Project Management (S/PM)

DESCRIPTION - Estimates Development System/Project Management cost as a percent of Development Prime Mission Product (PMP) cost. This factor was updated August 1998.

SOURCE DATA - An analysis was made of 200 CPRs and C/SSRs stored in ACEIT's

- **Analysts can document in real time:**
  - WBS
  - Methodology
  - Phasing
  - Risk
  - Adjustments

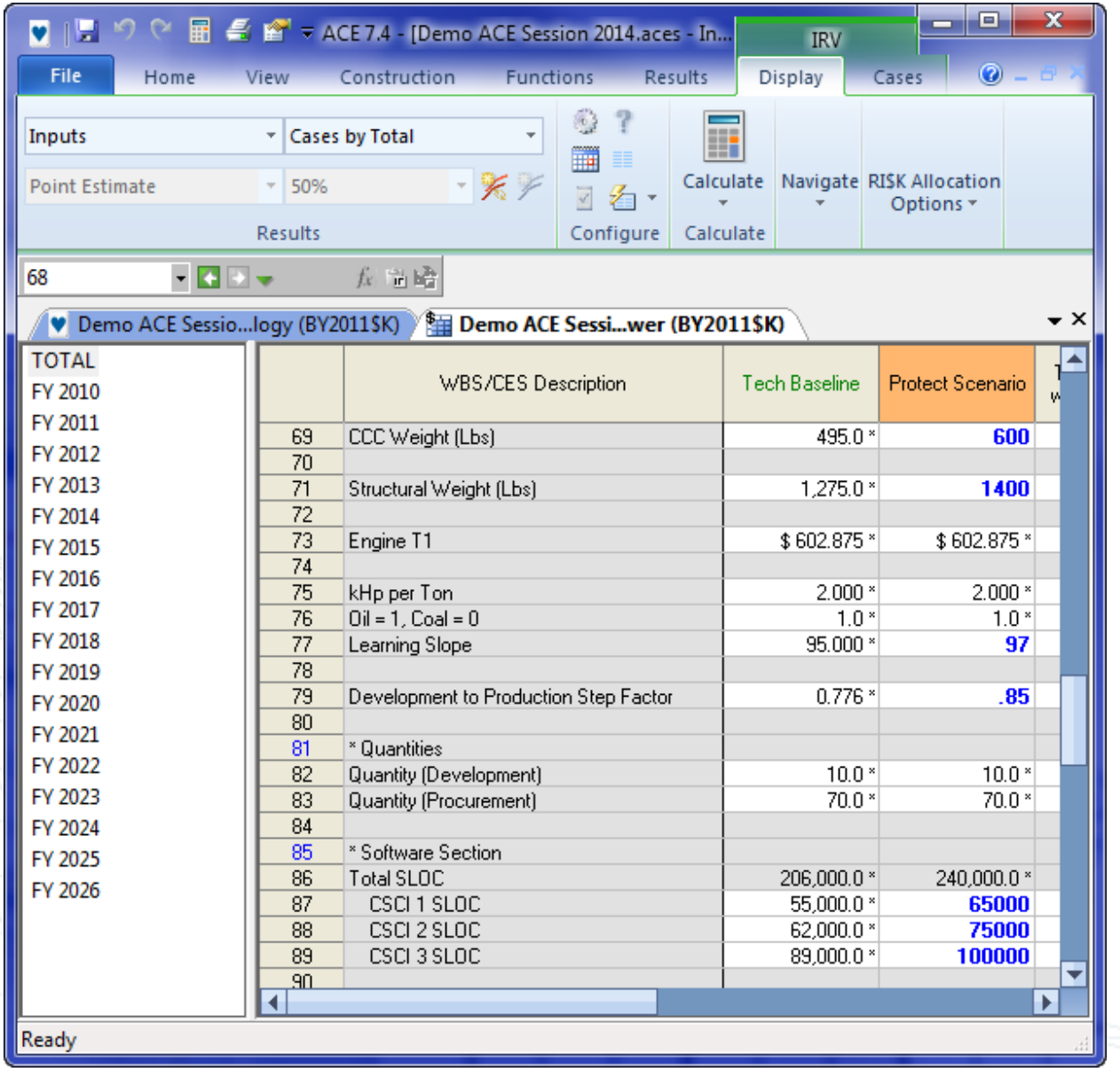
Quick Access to Estimate Results



- **Time-Phased Base Year and Then Year results can be quickly generated**
- **Estimated costs can be "racked and stacked" by various breakouts (Appropriation, Funding Agency, Contract Line Item, Job Order Number, Budget Line Item, etc.)**

Baselines can be Established as Basis for Scenario Evaluation

- Main methodologies are basis for all calculations
- Add an unlimited number of alternative scenarios (what if cases)
- Scenarios are enabled by overriding methodology equations and/or input variables (total or yearly)
- Supporting documentation, reports, time-phased (BY or TY) and risk results can be created for any scenario
- Cost Benefit Analysis calculations can be added to the session and evaluated for each alternative



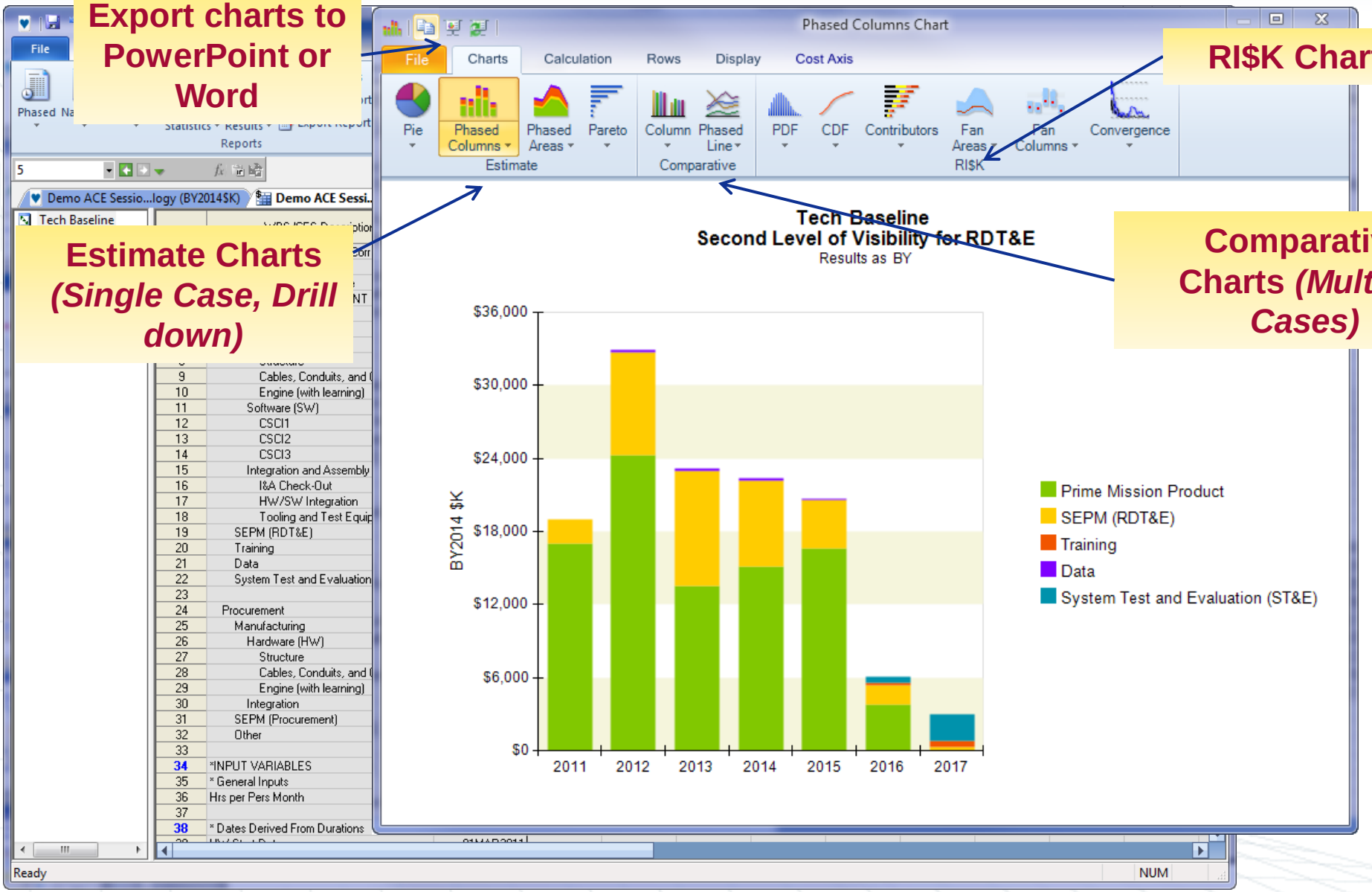
Graphically View Results in ACE

Export charts to PowerPoint or Word

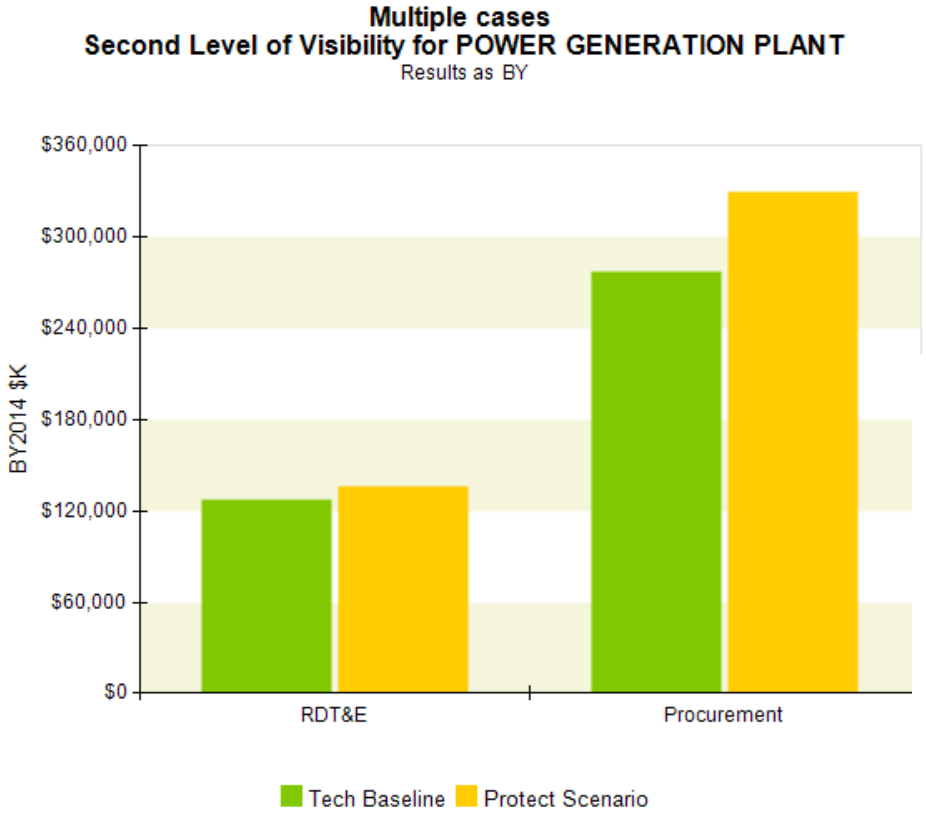
RI$K Charts

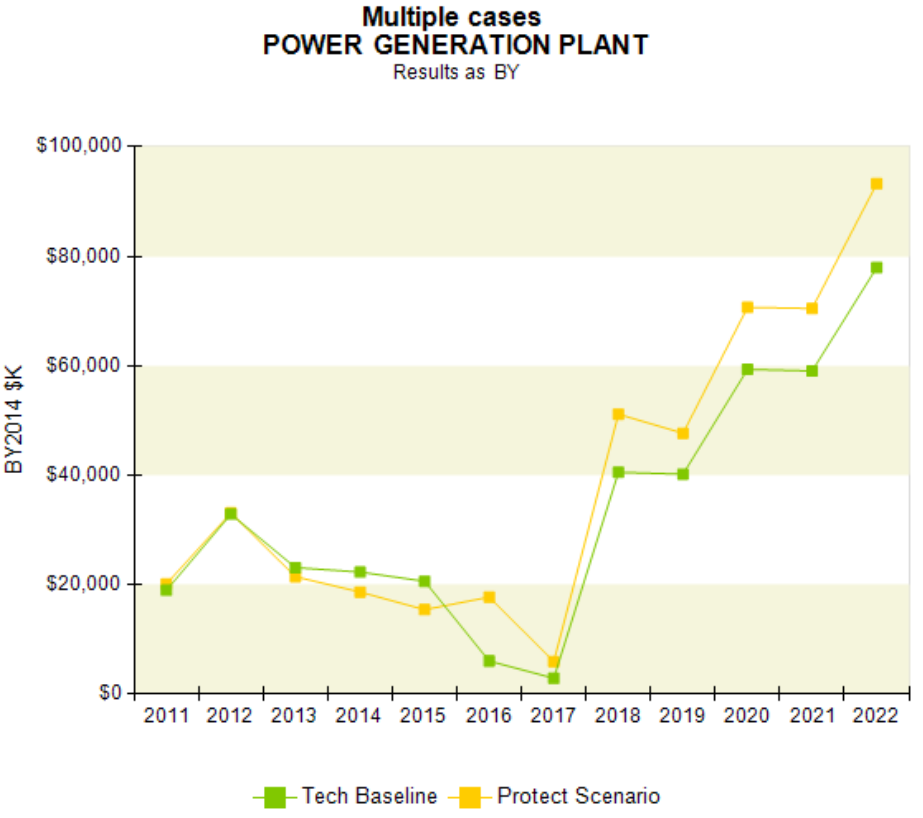
Estimate Charts *(Single Case, Drill down)*

Comparative Charts *(Multiple Cases)*



Graphical Outputs to Compare What-if Cases





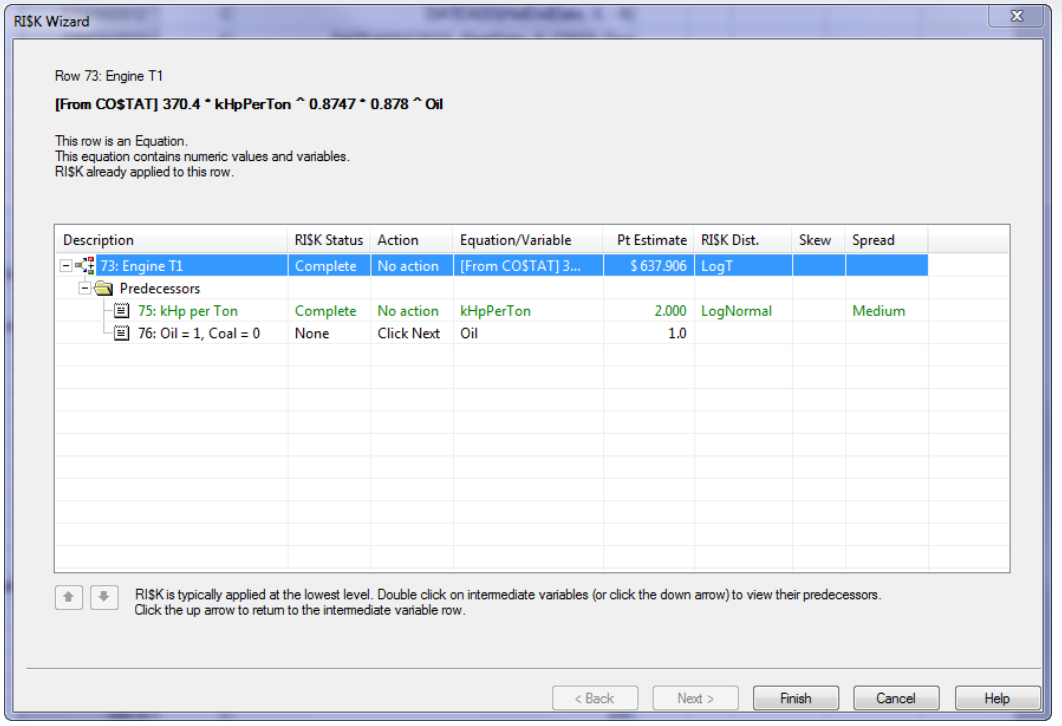
Uncertainty Analysis in ACE

What Does an Estimator Need to Perform Uncertainty Analysis?

- **Ability to apply uncertainty throughout the estimate**
  - Estimating Methodology (CERs)
  - Configuration (inputs)
  - Technical / Schedule
  - Discrete events
  - Correlate uncertainties
  - Sensitive to risk mitigation plans
- **Method to generate a defendable estimate of the overall uncertainty**
- **Ability to adjust the point estimate to a desired confidence level and to control how the risk dollars will be phased**
- **Charts/tables to present estimate uncertainty**

RI$K Wizard

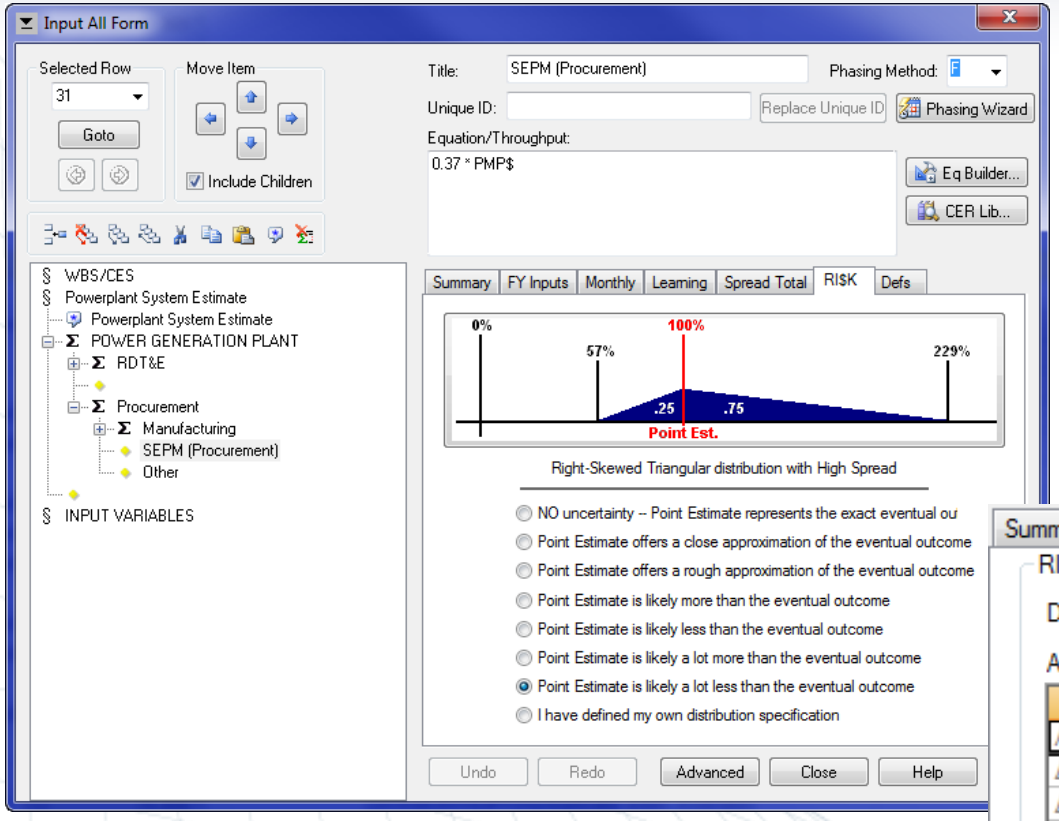
- RI$K Wizard. Designed for new analysts, provides easy-to-follow screens that apply RI$K distributions to the estimate
  - The wizard gives guidance on whether uncertainty should be specified:
    - on the current row
    - and/or on the variables
    - or not recommended for that type of methodology



- Easy-to-understand options help the analyst characterize the uncertainty
- The wizard also displays any rows or variables feeding into the current row and shows if they already have uncertainty specified. The analyst is given the opportunity to specify uncertainty on these rows also.

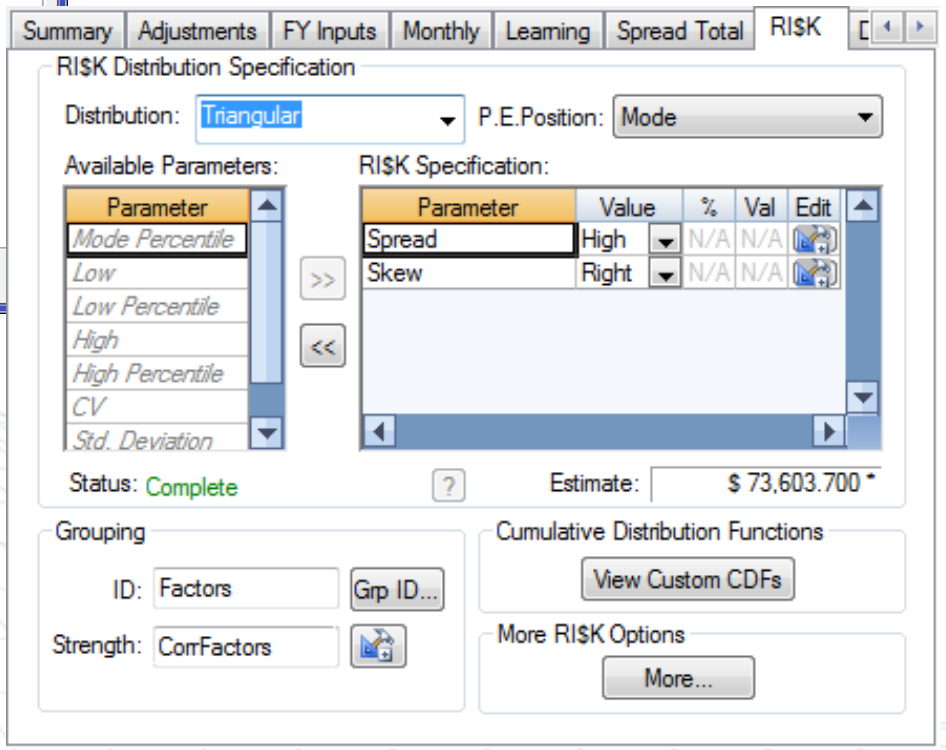
NOTE: Advanced analysts will most likely continue to use the Advanced mode of the Input All form or the RI$K workscreens to enter uncertainty.

Input All Form: Basic and Advanced Mode



Basic mode:

- Provides descriptive choices for specifying uncertainty
- Diagram changes based on selection



Advanced mode:

- Guides you through valid parameter choice
- Status tells you when the specification is Complete

Uncertainty Specification

- **Apply uncertainty to cost methods and cost drivers**
- **All uncertainty specifications available at a glance:**
  - **RI$K Spec**: Review or edit entire specification for that row
  - **Distribution**: Select shape (Normal, Log-normal, Student's t, Log-t, Triangular, Uniform, Beta, BetaPERT, Weibull, or user-defined CDF)
  - **Spread/Skew**: Assign default dispersion, or
  - **Define dispersion**: low/high as a value or % of PE, Stdev, CV, others
  - **Group**: apply correlation
  - **RI$K On/Off**: Control RI$K distributions used in the simulation

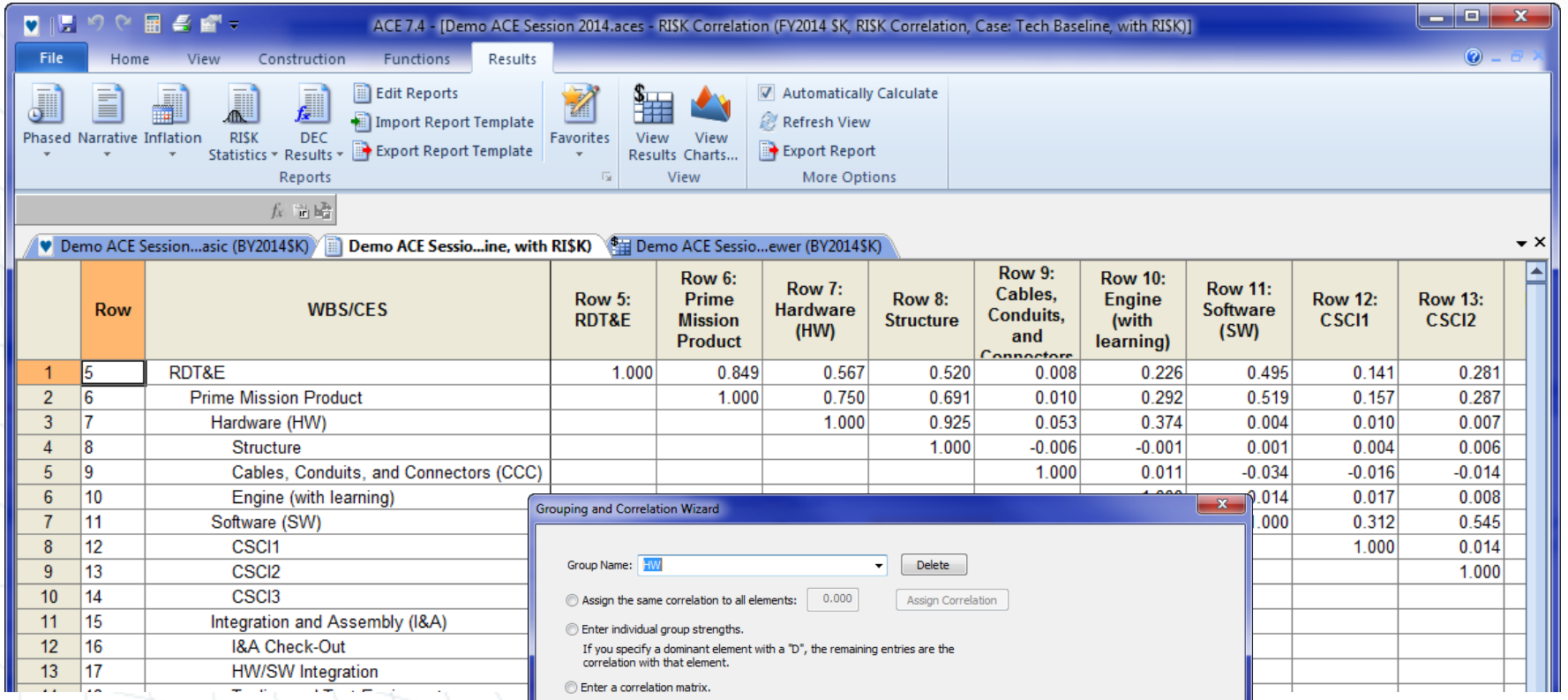
73 | Form=Log-t, PE=Median, High*=126.16, High%=95.0000, DF=14.0000, GrpID=HW, GrpStr=CorrHw_Other, Seed=1606972

Demo Ace Sessi...mns (BY2011$K)

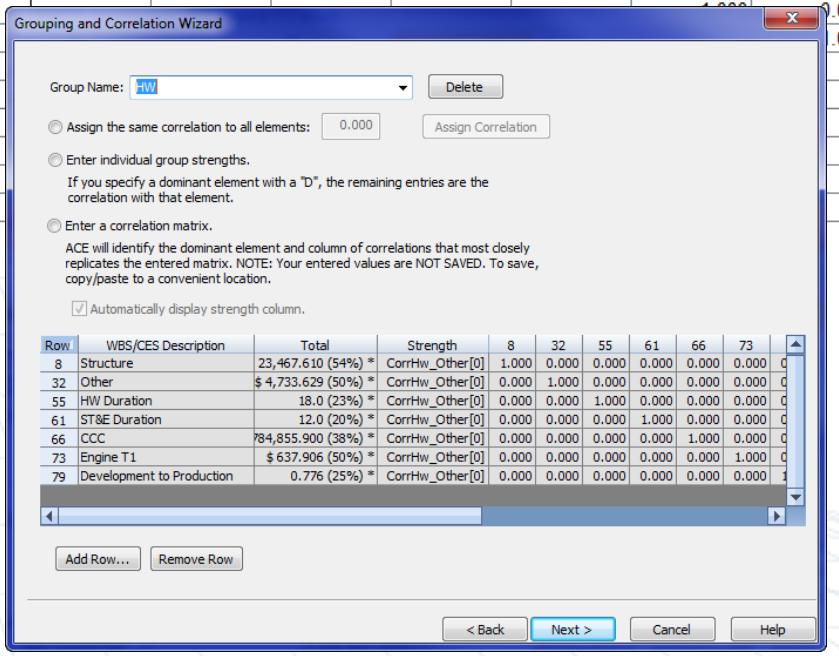
	WBS/CES	ID	Tech Baseline	Eq / Thruput	RI$K Spec	Group	Strength	Dist	PE Pos
73	Engine T1	Engine_T1	$ 602.875 *	[From CO$TAT] 370.4 * kHpPerTon ^ 0.8747 * 0.878 ^ Oil	Form=Log-t, PE=Median, High*=126.16,	HW	CorrHw_Other	Log-t	Median
74									
75	kHp per Ton	kHpPerTon	2.000 *	2	Form=lognormal,			lognormal	Median
76	Oil = 1, Coal = 0	Oil	1.0 *	1					
77	Learning Slope	EngLrnSlp	95.000 *	95					

Methodology | What if (read only) | Spread Total | Yearly Phasing | RI$K Basic | Learning | RI$K All Columns | Keywords

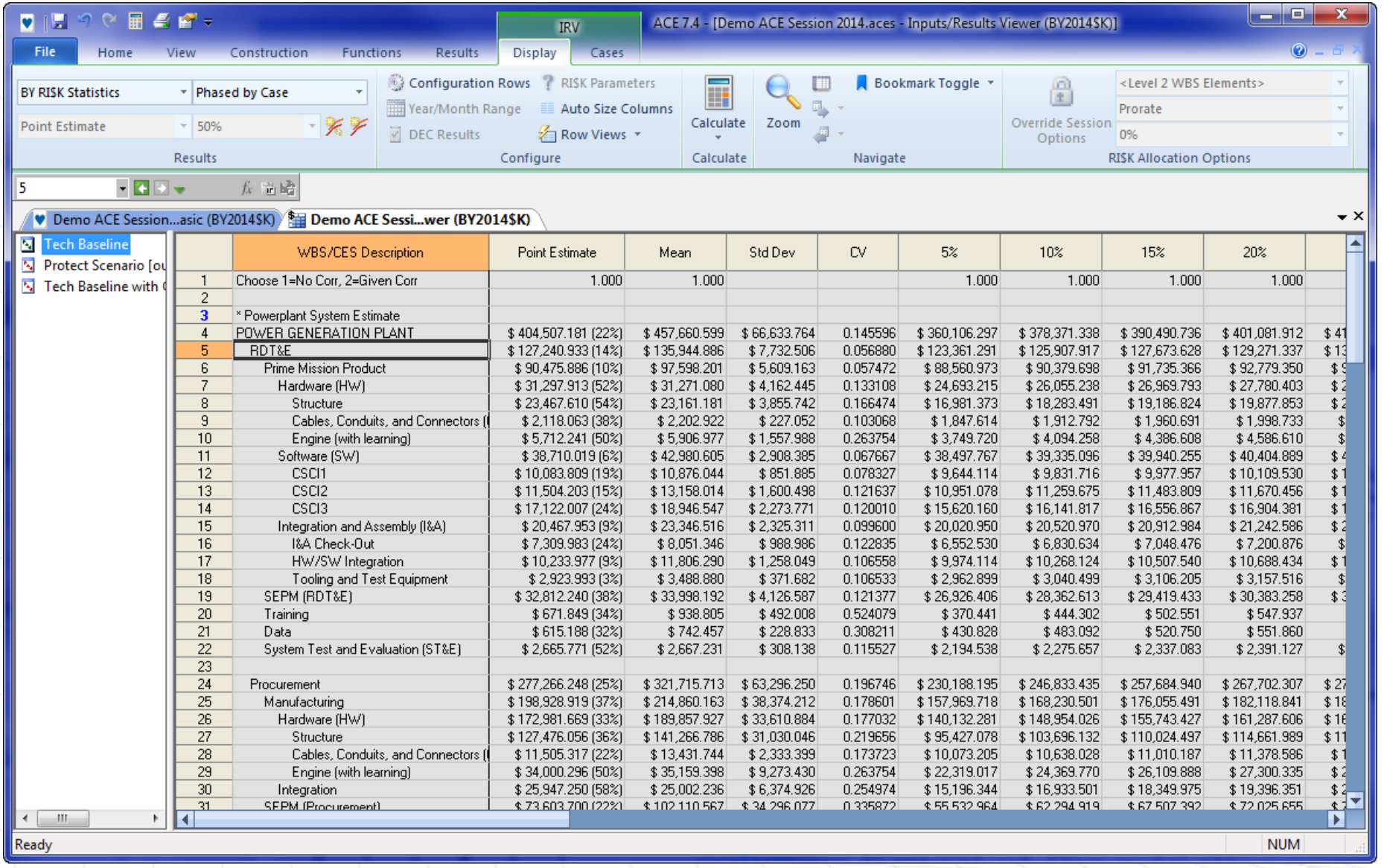
Correlation can be Assessed and Modeled



	Row	WBS/CES	Row 5: RDT&E	Row 6: Prime Mission Product	Row 7: Hardware (HW)	Row 8: Structure	Row 9: Cables, Conduits, and Connectors	Row 10: Engine (with learning)	Row 11: Software (SW)	Row 12: CSCI1	Row 13: CSCI2
1	5	RDT&E	1.000	0.849	0.567	0.520	0.008	0.226	0.495	0.141	0.281
2	6	Prime Mission Product		1.000	0.750	0.691	0.010	0.292	0.519	0.157	0.287
3	7	Hardware (HW)			1.000	0.925	0.053	0.374	0.004	0.010	0.007
4	8	Structure				1.000	-0.006	-0.001	0.001	0.004	0.006
5	9	Cables, Conduits, and Connectors (CCC)					1.000	0.011	-0.034	-0.016	-0.014
6	10	Engine (with learning)							0.014	0.017	0.008
7	11	Software (SW)							.000	0.312	0.545
8	12	CSCI1								1.000	0.014
9	13	CSCI2									1.000
10	14	CSCI3									
11	15	Integration and Assembly (I&A)									
12	16	I&A Check-Out									
13	17	HW/SW Integration									

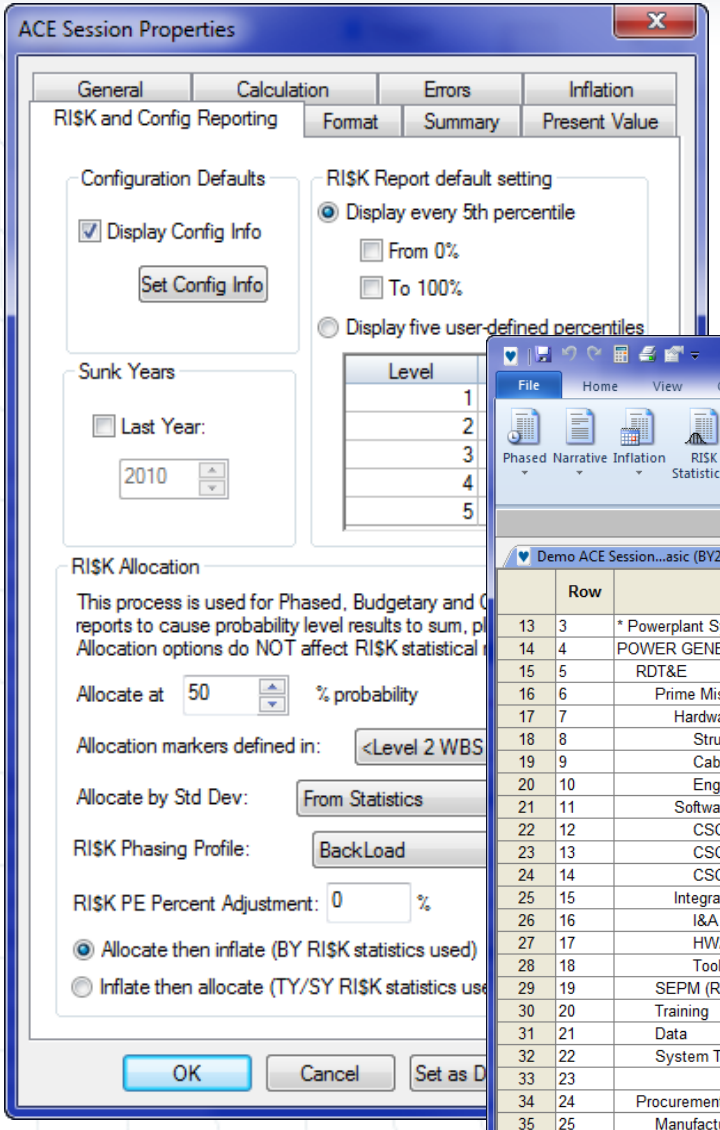


Risk Statistics Easily Available



	WBS/CES Description	Point Estimate	Mean	Std Dev	CV	5%	10%	15%	20%
1	Choose 1=No Corr, 2=Given Corr	1.000	1.000			1.000	1.000	1.000	1.000
2									
3	* Powerplant System Estimate								
4	POWER GENERATION PLANT	$ 404,507.181 (22%)	$ 457,660.599	$ 66,633.764	0.145596	$ 360,106.297	$ 378,371.338	$ 390,490.736	$ 401,081.912
5	RDT&E	$ 127,240.933 (14%)	$ 135,944.886	$ 7,732.506	0.056880	$ 123,361.291	$ 125,907.917	$ 127,673.628	$ 129,271.337
6	Prime Mission Product	$ 90,475.886 (10%)	$ 97,598.201	$ 5,609.163	0.057472	$ 88,560.973	$ 90,379.698	$ 91,735.366	$ 92,779.350
7	Hardware (HW)	$ 31,297.913 (52%)	$ 31,271.080	$ 4,162.445	0.133108	$ 24,693.215	$ 26,055.238	$ 26,969.793	$ 27,780.403
8	Structure	$ 23,467.610 (54%)	$ 23,161.181	$ 3,855.742	0.166474	$ 16,981.373	$ 18,283.491	$ 19,186.824	$ 19,877.853
9	Cables, Conduits, and Connectors (	$ 2,118.063 (38%)	$ 2,202.922	$ 227.052	0.103068	$ 1,847.614	$ 1,912.792	$ 1,960.691	$ 1,998.733
10	Engine (with learning)	$ 5,712.241 (50%)	$ 5,906.977	$ 1,557.988	0.263754	$ 3,749.720	$ 4,094.258	$ 4,386.608	$ 4,586.610
11	Software (SW)	$ 38,710.019 (6%)	$ 42,980.605	$ 2,908.385	0.067667	$ 38,497.767	$ 39,335.096	$ 39,940.255	$ 40,404.889
12	CSCI1	$ 10,083.809 (19%)	$ 10,876.044	$ 851.885	0.078327	$ 9,644.114	$ 9,831.716	$ 9,977.957	$ 10,109.530
13	CSCI2	$ 11,504.203 (15%)	$ 13,158.014	$ 1,600.498	0.121637	$ 10,951.078	$ 11,259.675	$ 11,483.809	$ 11,670.456
14	CSCI3	$ 17,122.007 (24%)	$ 18,946.547	$ 2,273.771	0.120010	$ 15,620.160	$ 16,141.817	$ 16,556.867	$ 16,904.381
15	Integration and Assembly (I&A)	$ 20,467.953 (9%)	$ 23,346.516	$ 2,325.311	0.099600	$ 20,020.950	$ 20,520.970	$ 20,912.984	$ 21,242.586
16	I&A Check-Out	$ 7,309.983 (24%)	$ 8,051.346	$ 988.986	0.122835	$ 6,552.530	$ 6,830.634	$ 7,048.476	$ 7,200.876
17	HW/SW Integration	$ 10,233.977 (9%)	$ 11,806.290	$ 1,258.049	0.106558	$ 9,974.114	$ 10,268.124	$ 10,507.540	$ 10,688.434
18	Tooling and Test Equipment	$ 2,923.993 (3%)	$ 3,488.880	$ 371.682	0.106533	$ 2,962.899	$ 3,040.499	$ 3,106.205	$ 3,157.516
19	SEPM (RDT&E)	$ 32,812.240 (38%)	$ 33,998.192	$ 4,126.587	0.121377	$ 26,926.406	$ 28,362.613	$ 29,419.433	$ 30,383.258
20	Training	$ 671.849 (34%)	$ 938.805	$ 492.008	0.524079	$ 370.441	$ 444.302	$ 502.551	$ 547.937
21	Data	$ 615.188 (32%)	$ 742.457	$ 228.833	0.308211	$ 430.828	$ 483.092	$ 520.750	$ 551.860
22	System Test and Evaluation (ST&E)	$ 2,665.771 (52%)	$ 2,667.231	$ 308.138	0.115527	$ 2,194.538	$ 2,275.657	$ 2,337.083	$ 2,391.127
23									
24	Procurement	$ 277,266.248 (25%)	$ 321,715.713	$ 63,296.250	0.196746	$ 230,188.195	$ 246,833.435	$ 257,684.940	$ 267,702.307
25	Manufacturing	$ 198,928.919 (37%)	$ 214,860.163	$ 38,374.212	0.178601	$ 157,969.718	$ 168,230.501	$ 176,055.491	$ 182,118.841
26	Hardware (HW)	$ 172,981.669 (33%)	$ 189,857.927	$ 33,610.884	0.177032	$ 140,132.281	$ 148,954.026	$ 155,743.427	$ 161,287.606
27	Structure	$ 127,476.056 (36%)	$ 141,266.786	$ 31,030.046	0.219656	$ 95,427.078	$ 103,696.132	$ 110,024.497	$ 114,661.989
28	Cables, Conduits, and Connectors (	$ 11,505.317 (22%)	$ 13,431.744	$ 2,333.399	0.173723	$ 10,073.205	$ 10,638.028	$ 11,010.187	$ 11,378.586
29	Engine (with learning)	$ 34,000.296 (50%)	$ 35,159.398	$ 9,273.430	0.263754	$ 22,319.017	$ 24,369.770	$ 26,109.888	$ 27,300.335
30	Integration	$ 25,947.250 (58%)	$ 25,002.236	$ 6,374.926	0.254974	$ 15,196.344	$ 16,933.501	$ 18,349.975	$ 19,396.351
31	SEPM (Procurement)	$ 73,603.700 (22%)	$ 102,110.567	$ 34,296.077	0.335872	$ 55,532.964	$ 62,294.919	$ 67,507.392	$ 72,025.655

Estimates can be Adjusted to Desired Confidence Levels



In constant or then year dollars

ACE 7.4 - [Demo ACE Session 2014.aces - TY Phased Costs (TY $K, Time Phased, Case: Tech Baseline, 50% CL allocated at Level 2)]

File | Home | View | Construction | Functions | Results

Phased | Narrative | Inflation | RISK Statistics | DEC Results | Edit Reports | Import Report Template | Export Report Template | Favorites | View Results | View Charts... | Automatically Calculate | Refresh View | Export Report

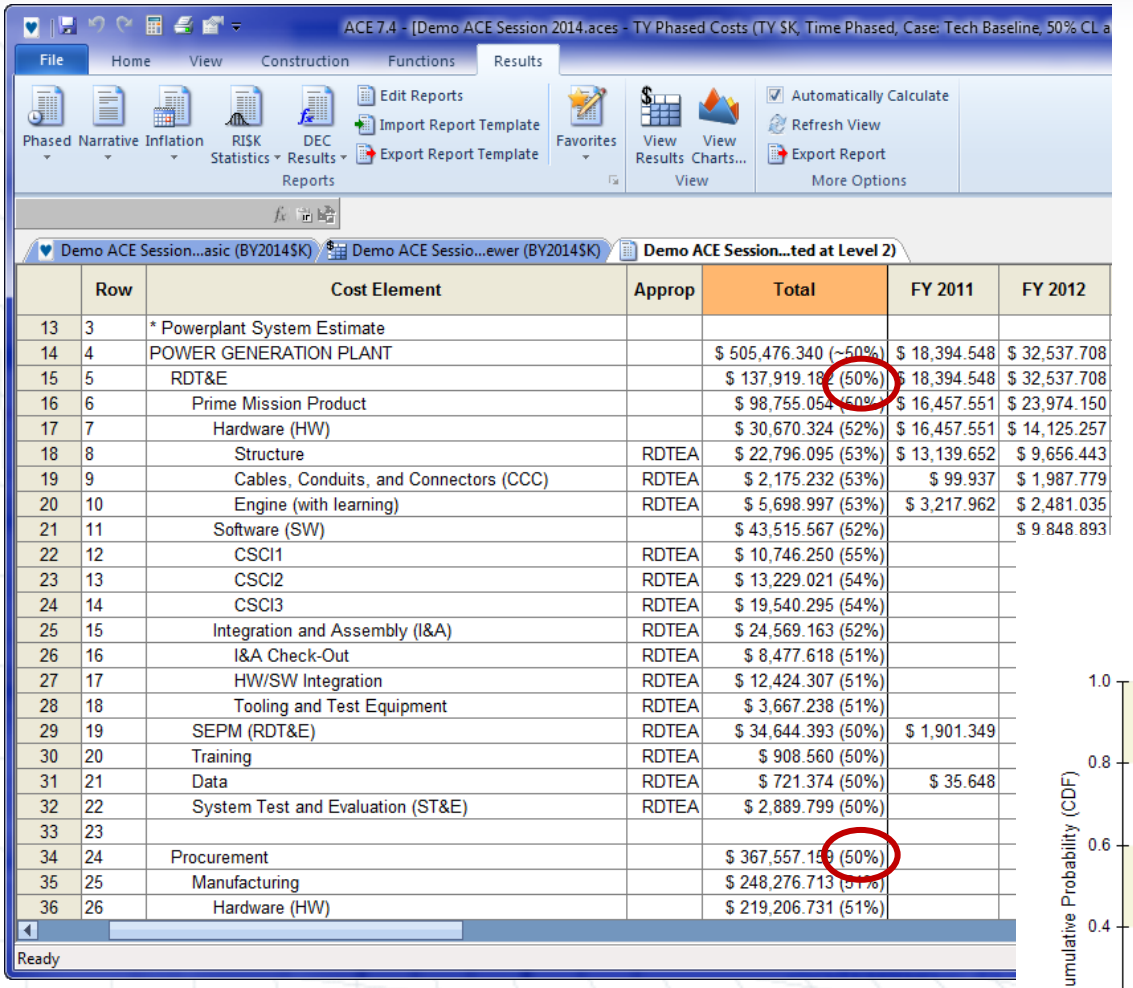
Reports | View | More Options

Demo ACE Session...asic (BY2014$K) | Demo ACE Sessio...ewer (BY2014$K) | Demo ACE Session...ted at Level 2)

	Row	Cost Element	Approp	Total	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
13	3	* Powerplant System Estimate								
14	4	POWER GENERATION PLANT		$ 505,476.340 (~50%)	$ 18,394.548	$ 32,537.708	$ 24,167.013	$ 26,144.292	$ 23,778.796	$ 9,484.868
15	5	RDT&E		$ 137,919.182 (50%)	$ 18,394.548	$ 32,537.708	$ 24,167.013	$ 26,144.292	$ 23,778.796	$ 9,484.868
16	6	Prime Mission Product		$ 98,755.054 (50%)	$ 16,457.551	$ 23,974.150	$ 14,524.747	$ 17,302.911	$ 19,468.123	$ 7,027.572
17	7	Hardware (HW)		$ 30,670.324 (52%)	$ 16,457.551	$ 14,125.257	$ 87.516			
18	8	Structure	RDTEA	$ 22,796.095 (53%)	$ 13,139.652	$ 9,656.443				
19	9	Cables, Conduits, and Connectors (CCC)	RDTEA	$ 2,175.232 (53%)	$ 99.937	$ 1,987.779	$ 87.516			
20	10	Engine (with learning)	RDTEA	$ 5,698.997 (53%)	$ 3,217.962	$ 2,481.035				
21	11	Software (SW)		$ 43,515.567 (52%)		$ 9,848.893	$ 14,437.231	$ 17,293.050	$ 1,936.393	
22	12	CSCI1	RDTEA	$ 10,746.250 (55%)		$ 9,848.893	$ 897.357			
23	13	CSCI2	RDTEA	$ 13,229.021 (54%)			$ 11,559.758	$ 1,669.263		
24	14	CSCI3	RDTEA	$ 19,540.295 (54%)			$ 1,980.115	$ 15,623.787	$ 1,936.393	
25	15	Integration and Assembly (I&A)	RDTEA	$ 24,569.163 (52%)				$ 9.861	$ 17,531.730	$ 7,027.572
26	16	I&A Check-Out	RDTEA	$ 8,477.618 (51%)				$ 3.522	$ 6,261.332	$ 2,212.764
27	17	HW/SW Integration	RDTEA	$ 12,424.307 (51%)				$ 4.930	$ 8,765.865	$ 3,653.512
28	18	Tooling and Test Equipment	RDTEA	$ 3,667.238 (51%)				$ 1.409	$ 2,504.533	$ 1,161.296
29	19	SEPM (RDT&E)	RDTEA	$ 34,644.393 (50%)	$ 1,901.349	$ 8,405.957	$ 9,464.813	$ 8,659.275	$ 4,180.219	$ 1,710.890
30	20	Training	RDTEA	$ 908.560 (50%)						$ 143.792
31	21	Data	RDTEA	$ 721.374 (50%)	$ 35.648	$ 157.601	$ 177.453	$ 182.106	$ 130.454	$ 32.077
32	22	System Test and Evaluation (ST&E)	RDTEA	$ 2,889.799 (50%)						$ 570.538
33	23									
34	24	Procurement		$ 367,557.159 (50%)						
35	25	Manufacturing		$ 248,276.713 (51%)						
36	26	Hardware (HW)		$ 219,206.731 (51%)						

Ready NUM

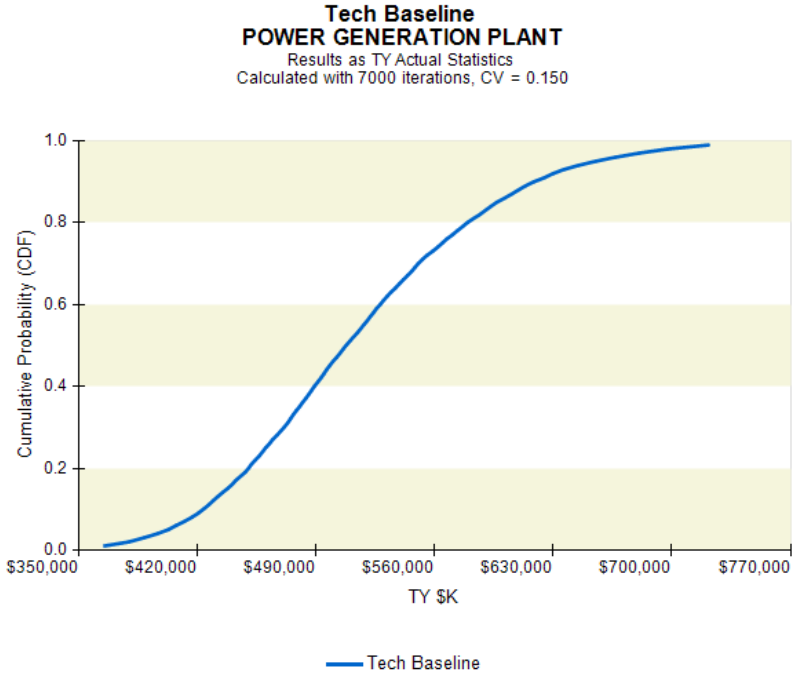
TY RI$K Results



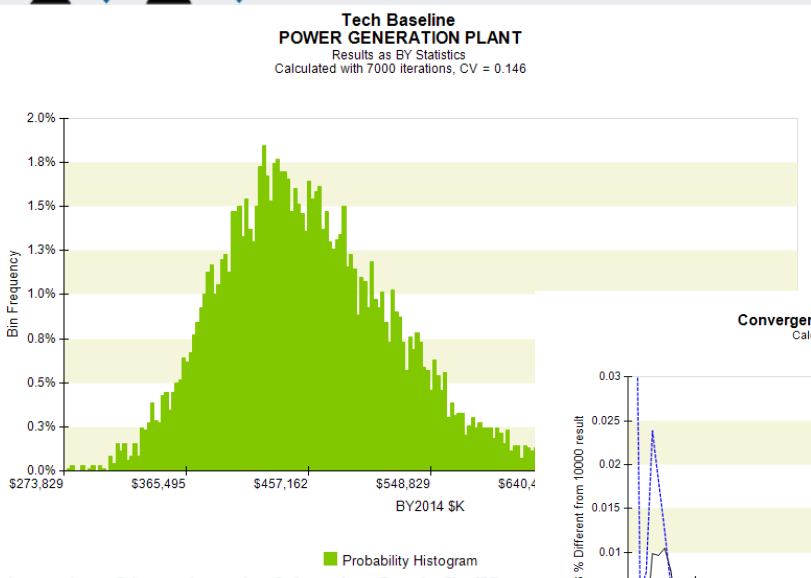
	Row	Cost Element	Approp	Total	FY 2011	FY 2012
13	3	* Powerplant System Estimate				
14	4	POWER GENERATION PLANT		$ 505,476.340 (~50%)	$ 18,394.548	$ 32,537.708
15	5	RDT&E		$ 137,919.182 (50%)	$ 18,394.548	$ 32,537.708
16	6	Prime Mission Product		$ 98,755.054 (50%)	$ 16,457.551	$ 23,974.150
17	7	Hardware (HW)		$ 30,670.324 (52%)	$ 16,457.551	$ 14,125.257
18	8	Structure	RDTEA	$ 22,796.095 (53%)	$ 13,139.652	$ 9,656.443
19	9	Cables, Conduits, and Connectors (CCC)	RDTEA	$ 2,175.232 (53%)	$ 99.937	$ 1,987.779
20	10	Engine (with learning)	RDTEA	$ 5,698.997 (53%)	$ 3,217.962	$ 2,481.035
21	11	Software (SW)		$ 43,515.567 (52%)		$ 9,848.893
22	12	CSCI1	RDTEA	$ 10,746.250 (55%)		
23	13	CSCI2	RDTEA	$ 13,229.021 (54%)		
24	14	CSCI3	RDTEA	$ 19,540.295 (54%)		
25	15	Integration and Assembly (I&A)	RDTEA	$ 24,569.163 (52%)		
26	16	I&A Check-Out	RDTEA	$ 8,477.618 (51%)		
27	17	HW/SW Integration	RDTEA	$ 12,424.307 (51%)		
28	18	Tooling and Test Equipment	RDTEA	$ 3,667.238 (51%)		
29	19	SEPM (RDT&E)	RDTEA	$ 34,644.393 (50%)	$ 1,901.349	
30	20	Training	RDTEA	$ 908.560 (50%)		
31	21	Data	RDTEA	$ 721.374 (50%)	$ 35.648	
32	22	System Test and Evaluation (ST&E)	RDTEA	$ 2,889.799 (50%)		
33	23					
34	24	Procurement		$ 367,557.159 (50%)		
35	25	Manufacturing		$ 248,276.713 (51%)		
36	26	Hardware (HW)		$ 219,206.731 (51%)		

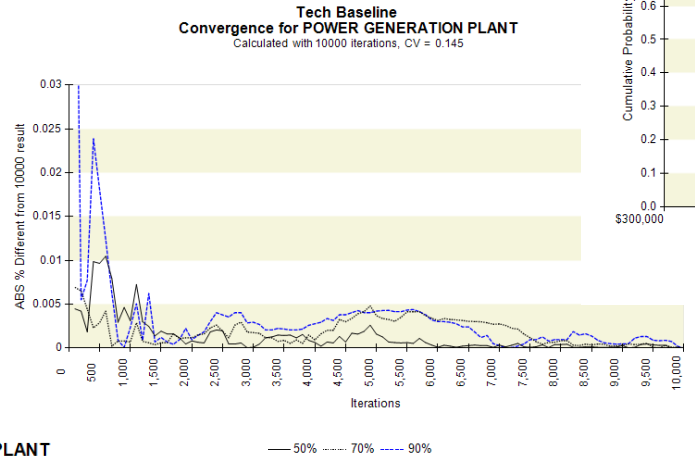
- TY time phased RI$K results allocated at specified confidence level from a specified level in the WBS
- **In this case, 50% from 2nd level, meaning RDT&E and Procurement are the 50% statistical results, remaining levels adjusted to sum**

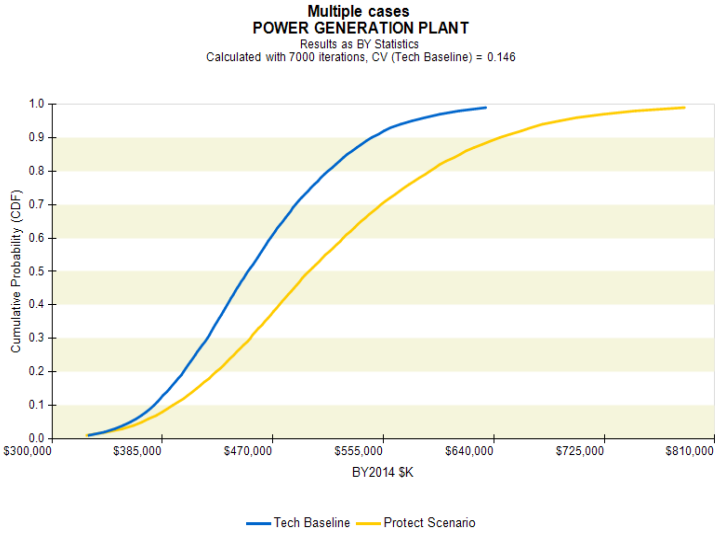
- TY RI$K cumulative distribution curve

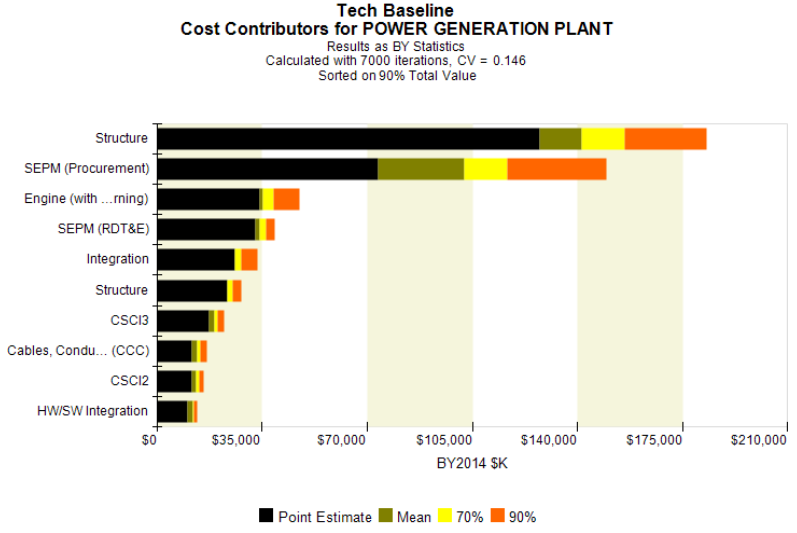


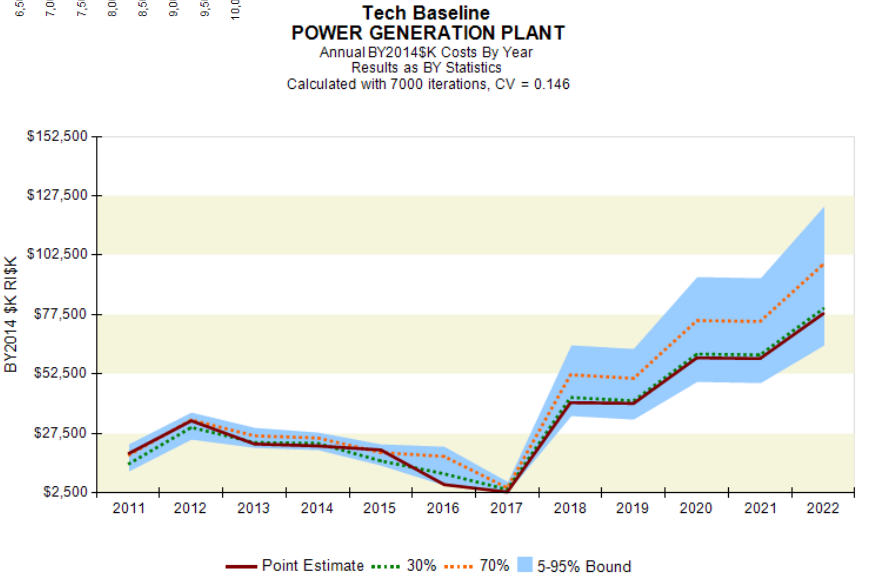
Graphical Outputs to Present Uncertainty Results











Benefits of Using ACEIT are Substantial

- **Implements standardized process and increases estimate quality**
  - Supports development of consistent, systematic, and defendable Life Cycle Cost Estimates
  - Delivers integrated, automated documentation, with complete audit trail
  - Improves estimate review and verification process through consistent model structure
  - Contains industry approved algorithms and databases to model inflation, learning, and phasing
  - Integrates statistical and risk analysis to quantify uncertainty in estimates
  - Enhances quality by eliminating many errors often made in spreadsheets (which frequently go undetected)
- **Provides flexibility to model any system type**
  - Unlimited flexibility to model any type of system linking all life cycle phases and facilitate any type of Analysis of Alternatives
  - Huge variety of automated and customizable reports
- **Integrates with other applications through an open platform**
  - Ability to link to virtually any other tool
  - Robust Application Programming Interface (API) to facilitate electronic interaction
- **Reduces management challenges**
  - Structured modeling platform shortens time for ACE users to learn a new model
  - Eases organization-wide distribution of key standards (WBS, inflation, etc.)
  - Empowers the analysts to answer Key Program/Project Management questions