

## [Survey of Cost Risk Analysis Practices in the U.S. Aerospace Industry](#)

Thank you for participating in this important survey of U.S. Aerospace cost risk analysis practices. Your inputs are important to a comprehensive understanding of Aerospace Industry cost risk analysis across the United States. Responses are welcome from all in the U.S. Aerospace Industry ... Government, Contractor, University, Consultant, or Support Contractor.

Cost risk assessment aids Government and Contractor business decisions and increases cost realism. For the survey results to be comprehensive, we are contacting members of ISPA, SCEA, and SSCAG. Your participation in this web-based survey (10-15 minutes) will increase the breadth and depth of conclusions.

This survey considerably expands on the initial one taken at the 1998 Toronto SCEA-SSCAG conference. The results will compare the 1998 and 2008 surveys, and hopefully depict positive trends. Survey tallies and analyses will be presented as a paper at ISPA-SCEA and SSCAG conferences (Netherlands, May'08), and the SCEA-ISPA conference in (SoCal, June'08). SCEA plans to publish the results in the Estimator (Fall'08).

The survey requests 3 types of data entry ...

- Multiple choice ... please mark one or more boxes, with any character
- Fill-in-the-blank ... open ended questions
- % Percent of time applicable to your organization

Your percent entries are auto-summed to help you reach 100%

*Survey automatically calculates sum of previous entries. No entry here.*

*Please do not add new rows or columns.*

*Thank you for taking a few minutes of your valuable time to fill out the survey!*

*Please send survey directly to Hollis Black at ... [hollis.m.black@boeing.com](mailto:hollis.m.black@boeing.com)*

Contact at (256) 461 - 2998

- In order to avoid duplication and know the survey breadth, we request identity information. We will not, however, attribute any of your responses to you or your specific organization without your express consent.

- Your name .....
- Organization .....
- E-mail .....
- Phone .....


- What general organizations do you participate in?

- (Please mark all that apply.)
- Government
- Industry – Prime Contractor
- Industry – Support Contractor
- University
- Consulting Firm
- Independent Consultant
- CETA
- FFRDC
- Other

- What customers do you support?

- (Please mark all that apply.)
- Army
- Navy
- Air Force
- Marines
- NASA
- DoD Other
- Civil other

- Government Other
- Commercial
- Foreign Government
- Other

▪ **What Organizations or Societies do you participate in?**

- (Please mark all that apply.)
- SCEA
- ISPA
- SSCAG
- NASA / CASG
- MORS
- DoDCAS Other
- ACOST
- SCAF
- EACE
- NAA – IMA
- AIAA

1 **WHEN - Under which circumstances does your organization develop cost risk analysis?**

- (Please mark all that apply.)
- All projects, regardless of size
- Projects exceeding minimum \$ threshold. Please specify limit
- Projects with significant technical risk
- Projects with significant schedule risk
- Ventures without government funding guarantees ('commercial')
- International projects with difficult terms & conditions
- Customer requirement (RFP or contract deliverable)
- Other ... please write in to the right ----->





2 **WHEN - What percent of the time (i.e., "how often") does your organization quantify cost risk for these types of estimates?**

- % Rough Order of Magnitude (ROM's) for concept studies
- % Major design trades
- % Proposal -- DDT&E/EMD
- % Proposal -- Production
- % Proposal -- Operations-sustaining
- % Independent Cost Estimates (ICE's)

3 **BENEFITS - Which of the following does your organization see as key benefits of 'Cost Risk Analysis?'**

- (Please mark all that apply.)
- Probability of achieving performance within cost (before or after award)
- Evaluate sufficiency of mgmt reserve (EACs after contract award)
- Manage, prioritize, and mitigate program risks
- Basis of design-cost trades (i.e., sensitivity analysis)
- Basis of business decisions (bid/no-bid, make/buy, relocation, teaming)
- To meet customer requirement
- Other ... please write in to the right ----->




4 **WHO - What functional organization is most responsible for performing cost risk analysis?**

- (Please mark just one)
- Finance cost estimating and analysis
- Engineering cost estimating
- Management
- Not assigned specifically (all organizations)
- Not applicable. Cost risk analysis not performed.

5

**WHEN** - Is "Cost Risk Analysis" a separate task performed after the cost estimate is complete? Or is it an integral part of the cost estimating process?

- (Please mark just one)
- Always integrated with the baseline cost estimate
- Partially integrated
- Always a separate task after estimate is complete

6

**WHAT** - Which of the following are included in your organization's assessment of Cost Risk?

- (Please mark all that apply.)
- Technical risk and 5x5 matrix (only)
- Technical, schedule, sub-contract, and business risks
- Estimating error (variation in historical cost relationships, unknowns)
- Cost to mitigate (avoid, handle, lessen) risk
- Cost of absorbing an unmitigated risk
- Opportunities to reduce cost ("affordability," "lean", etc.)



7

**METHOD** - Please identify the methods your organization typically uses to perform cost risk analysis. Indicate percent of time each used.

- Analytic ... method of moments ... distribution based
- Monte Carlo simulation
- Total should add to 100%

8

**TOOLS** - Please identify the tools your organization typically uses to perform cost risk analysis. Indicate percent of time each used.

- ACE (RISK)
- @RISK
- Crystal Ball
- FRISK / NAFCOM
- In-house (customized)
- ProAct
- Risk+
- SEER
- TruePlanning (PRICE)
- None
- Other ... please write in to the right ----->
- Total should add to 100%

9

**TOOL ISSUES** - What risk analysis tools need to be improved? Please write-in the tool name (e.g., ACE-IT, SEER, @RISK, PRICE, NAFCOM, Crystal Ball, etc.) and needed improvement.)

- SEER improvement needed ----->
- PRICE improvement needed ----->
- NAFCOM improvement needed ----->
- Crystal Ball improvement needed ----->
- @RISK improvement needed ----->
- ACE-IT improvement needed ----->



10

**METHOD** - How does your organization typically estimate cost uncertainties (low-high range or standard deviation)? Indicate percent of time each used.

- Statistical analysis from history
- Team consensus, using guided survey (subjective)
- Team consensus, subjective
- One analyst, subjective
- Total should add to 100%



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**DISPLAY** - How do you display the outcome of cost risk assessment to management? Please indicate percent of time each used (total 100%).

- Cum-S curve

- PDF (Probability Density Function)
- Low-high risk range
- Tornado chart (plus-minus sensitivity)
- Statistics (mean and standard deviation)
- Other ... please write in to the right ----->
- Total should add to 100%

**12 LEVEL -** For what program level do you typically report risk results?

- Total program
- WBS or cost element
- Phase (DDT&E, LRIP, Production, O&S)
- Total should add to 100%

**13 DISTRIBUTIONS -** Analysts tend to prefer certain types of probability distributions. What distribution type does your organization find best fits historical data? Please indicate percent of time each is used (total 100%).

- Triangular
- Log-normal
- Beta
- Weibull
- Trapezoidal
- Other ... please write in to the right ----->
- Total should add to 100%

14

**SPECIALIZED -** Is cost risk analysis considered to be a highly specialized activity?

- (Please mark just one)
- Yes, high specialized, only a few can do it.
- Somewhat specialized, many can do it.
- No, not highly specialized, all should be able to do it.
- Other ... please write in to the right ----->




**15 DIFFICULTY -** Is cost risk analysis difficult?

- (Please mark just one)
- Yes
- Sometimes
- No
- Other ... please write in to the right ----->

**16 TRAINING -** Does your organization provide training in cost risk analysis?

- (Please mark just one)
- Yes, internal training
- Yes, external training
- Yes, both internal and external training
- Informally only, no formal training
- No training
- Other ... please write in to the right ----->

**17 TRAINING -** What training courses in cost risk analysis have you found most effective?

**18 REFERENCES -** What reference documents do you find most helpful in conducting cost risk analysis?

**19 MITIGATION -** How does your organization mitigate unacceptably high program risks (technical, performance, schedule, etc.)? Please indicate percent of time each is used (total 100%).

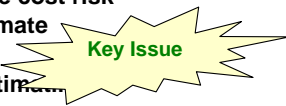
- Improve design at a higher cost (redundancy, reliability, etc.)
- Increase IR&D targeted at technical hurdles (TRLs)
- Further test developing technologies



<input type="checkbox"/>	%	Re-scope requirement and develop mitigation plan.
<input type="checkbox"/>	%	Slow project and/or wait for affordability technology in risk areas
<input type="checkbox"/>	%	Revised design/fab processes and environment
<input type="checkbox"/>	%	Press on in hope that supporting technologies will mature in time
<input type="checkbox"/>	%	Other ... please write in to the right .....
<input type="checkbox"/>	%	Total should add to 100%

20

**RISK MANAGEMENT** - To what extent does your organization integrate cost risk analysis into the overall Risk Mgmt process? Please indicate approximate percent of time programs reach these 5 maturity levels (total 100%).



<input type="checkbox"/>	%	1 - Cost risks are sometimes assessed and quantified in the estimation process.
<input type="checkbox"/>	%	2 - Cost risk ranges (low-likely-high) are occasionally provided.
<input type="checkbox"/>	%	3 - High probability risks are quantified in cost estimates; or tracked in a risk mitigation plan that effectively reduces risk to moderate/low.
<input type="checkbox"/>	%	4 - Cost Risk Analysis has been integrated with Risk Mgmt Plans; is tracked and managed by the program.
<input type="checkbox"/>	%	5 - Cost Risk Analysis has been integrated with Risk Mgmt Plans; is tracked and managed by the program; and is evident in proposals, EVMS, and EACs to support decision making.
<input type="checkbox"/>	%	Other ... please write in to the right .....
<input type="checkbox"/>	%	Total should add to 100%

21 **CONFIDENCE** - What confidence level does your organization typically accept for cost estimates?



<input checked="" type="checkbox"/>	(Please mark just one)
<input type="checkbox"/>	40%
<input type="checkbox"/>	50%
<input type="checkbox"/>	60%
<input type="checkbox"/>	70%
<input type="checkbox"/>	80%
<input type="checkbox"/>	90%

22 **HURDLES** - What constraints do you face in performing cost risk analysis?

<input checked="" type="checkbox"/>	(Please mark all that apply.)
<input type="checkbox"/>	Limited functional support to identify and assess program risks
<input type="checkbox"/>	Sparse historical data to support cost risk ranges
<input type="checkbox"/>	Excessive judgment in analysis undercuts credibility
<input type="checkbox"/>	Cost risk analysts lack necessary tools
<input type="checkbox"/>	Cost risk analysts lack experience
<input type="checkbox"/>	Presentations of cost risk to management lack power to convince
<input type="checkbox"/>	Management and functionals are overwhelmed with complex analyses
<input type="checkbox"/>	Management skeptical of groundrules, analysis, and conclusions
<input type="checkbox"/>	Other ... please write in to the right .....




**Thank you for contributing to our knowledge of the U.S. Aerospace practice of cost risk analysis!**  
**Please email to [hollis.m.black@boeing.com](mailto:hollis.m.black@boeing.com)**