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OFFICE OF THE ASSISTANT SECRETARY
(FINANCIAL MANAGEMENT AND COMPTROLLER)
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NCCA
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NCCA Instruction 4451.1B

From: Executive Director, Naval Center for Cost Analysis (NCCA)

Subj: COST ESTIMATING DOCUMENTATION POLICY

Encl: (1) Cost Estimating Documentation Guide

1. Cancellation. NCADINST 4451.1A

2. Purpose. Promulgate the NCCA Cost Estimating Documentation Guide as enclosure (1). The procedures and requirements delineated in the guide shall be followed for documenting NCCA independent life-cycle cost estimates.

3. Discussion. Cost analysts need the ability to compare past life-cycle cost estimates to program execution in order to explain changes to stakeholders and to improve cost estimating processes. By implementing the new procedures contained in enclosure (1), NCCA ensures a traceable record of inputs, methodology, and estimates used in support of key decisions. The resulting historical record will enable NCCA to identify necessary improvements in estimating processes and methodologies for future cost estimates.

4. Revisions. Change or revision recommendations may be forwarded to the Executive Director, Naval Center for Cost Analysis.

5. Action. Enclosure (1) assigns documentation responsibilities within NCCA and all NCCA personnel shall comply with the guidance therein. Estimate documentation should not be provided to other organizations unless specifically authorized by the Executive Director, Naval Center for Cost Analysis.

Wendy P. Kunc

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Deputy Assistant Secretary of the Navy
(Cost & Economics)

Cost Estimating Documentation Guide



Prepared by

Deputy Assistant Secretary of the Navy (Cost & Economics)
Naval Center for Cost Analysis

Purpose:

Provide Naval Center for Cost Analysis (NCCA) policy on cost estimating documentation for NCCA Independent Cost Estimates (ICEs) and other cost estimates directed by the Deputy Assistant Secretary of the Navy (Cost and Economics) (DASN(C&E)).

Introduction:

NCCA performs cost estimates to inform Department of Navy decisions and meet Department of Defense (DoD) regulations and Federal Law. Often, this process requires reference to previous estimates in order to understand an earlier basis of estimate in light of program changes, serve as a reference for future cost estimates, and improve estimating techniques. The Government Accountability Office (GAO) considers documentation that permits independent recreation of the estimate to be a cost estimating best practice. The ability to provide consistent, quality documentation that reflects an analyst's careful consideration in developing the estimate is critical to NCCA's credibility. Maintaining a written record of the analysis including an electronic copy of the final cost model consistent with the final NCCA estimate briefed to leadership, is an important and necessary part of the cost estimating process.

The goal of the NCCA documentation standard is to establish a best practice consistent with the 2009 GAO Cost Estimating and Assessment Guide Chapter 16 and the 1992 DoD 5000.4-M "Cost Analysis Guidance and Procedures" without adding unnecessary requirements to analyst workload.

The documentation standard includes document preparation instructions, the review process, and archival procedures.

Writing acceptable documentation:

Acceptable documentation allows a person not associated with the estimate to:

- Understand the life-cycle constant year (CY) dollar and the then-year (TY) dollar point estimate, and the risk and uncertainty adjusted estimate; by appropriation, Work Breakdown Structure (WBS), and by year.
- Understand the scope, ground rules, and assumptions associated with the estimate. Any major elements excluded by program scope or estimate ground rules should be noted. Major interfaces and interdependencies with other programs should be noted.
- Trace, understand, replicate, and update the estimate calculations from the raw cost data and model inputs to the time-phased point estimate results shown by WBS element. The raw data and model inputs should be clearly referenced and archived with the model.
- Understand why the estimating team chose the selected methodology and see any crosschecks performed by the estimating team.
- Understand sunk costs by WBS element, by year.

- Understand the evolution of the program and associated cost estimates over time, if applicable.
- Understand and replicate how cost risk and uncertainty is modeled to include sensitivity analysis.

The cost estimating team can use their cost model to document their cost estimate, provided the team creates the cost model in a way that meets all the objectives of acceptable documentation and is understandable to a trained person who did not develop the model. The model must have no hard-coded numbers, other than raw data, parametric model parameters, technical inputs, programmatic inputs directly derived from another source, or any risk and uncertainty results from simulation software. The source of hard-coded data must be documented as necessary to ensure traceability of data, inputs, and Cost Estimating Relationships (CERs) to original source. The model must include sunk costs by WBS element. Documenting the estimate shall not be a last minute effort. NCCA analysts will follow good documentation practices while developing an estimate to minimize later post-estimate work. NCCA will provide periodic training on documentation to NCCA analysts to assist in developing good estimating practices.

The content in appendix (1), influenced by the GAO Cost Estimating and Assessment Guide and the NAVSEA documentation standard, is required to meet acceptable documentation requirements. As long as the documented cost model provides the required content in a clear manner, the cost estimating team may tailor the format. If tailored, the format must be approved by the Technical Director and the Cost Research Branch early in the estimating process to ensure they are capturing the needed information.

For estimates developed in Automated Cost Estimating Integrated Tools (ACEIT), the documentation features in ACE are to be used to document the cost estimate in concert with this guide. Appendix (2) is provided to assist with documenting Excel spreadsheets.

Reviewing the estimate documentation:

The cost estimating team documents data and methodology as they develop the estimate. The documentation review process includes the following steps:

1. A draft of the documentation is delivered at the final Technical Review Board (TRB).
2. The technical director, applicable group technical advisor, and the Cost Research Branch review the documentation to ensure the documentation meets the NCCA documentation standards and objectives. Comments to the cost estimating team are to be provided within two weeks after final TRB.
3. Final documentation is delivered one month after final Cost Review Board (CRB).
4. Technical Director approves final documentation.

The documentation shall be consistent with the final ICE memo, or in the case of estimates other than ICEs, the final NCCA position.

Archiving the estimate documentation:

The final documentation will be placed into the program/milestone folder on NCCA's shared drive and placed into a restricted area of NCCA's cost library accessed through the NCCA website. The shared drive location shall follow structure "program/milestone/NCCA estimate" and include at minimum the cost model, any associated documentation done separately from the model, and all referenced documents.

Cost Documentation process completion:

A cost estimate is not complete until the documentation is complete and formally accepted by NCCA leadership. Once the documentation has been reviewed and recommendations implemented as needed, the NCCA Technical Director approves the document and the document is archived. The technical director notifies the NCCA Executive Director of the estimate and documentation approval and archival.

Appendix (1)

[Descriptive Title]

[Optional Subtitle or Picture]

[Date]



Prepared by

**Deputy Assistant Secretary of the Navy Cost & Economics
Naval Center for Cost Analysis**

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Executive Summary

The executive summary should be a narrative format summarizing the important results and conclusions from the NCCA estimate. The summary should include a top level then-year (TY) dollar cost risk and uncertainty adjusted point estimate by year by appropriation in one table, commonly known as the Spruill Chart. See example below.

Total Program Funding and ICE Comparison as of ...											
RDT&E [\$M TY]	Prior	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY11-16	To Complete	Total
Current budget (BES-12, etc.)									\$ -		\$ -
NCCA									\$ -		\$ -
Delta (BES-12 - NCCA)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	N/A	N/A
Procurement (APN 1/6, SCN, OPN, WPN, PANMC) [\$M TY]											
Current budget (BES-12, etc.)									\$ -		\$ -
NCCA									\$ -		\$ -
Delta (BES-12 - NCCA)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	N/A	N/A
APN 5 [\$M TY]											
Current budget (BES-12, etc.)									\$ -		\$ -
NCCA									\$ -		\$ -
Delta (BES-12 - NCCA)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	N/A	N/A
MILCON [\$M TY]											
Current budget (BES-12, etc.)									\$ -		\$ -
NCCA									\$ -		\$ -
Delta (BES-12 - NCCA)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	N/A	N/A
O&M [\$M TY]											
Current budget (BES-12, etc.)									\$ -		\$ -
NCCA									\$ -		\$ -
Delta (BES-12 - NCCA)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	N/A	N/A
QUANTITIES											
Current budget (BES-12, etc.)									0		0
NCCA									0		0
Delta (BES-12 - NCCA)	0	0	0	0	0	0	0	0	0	N/A	N/A
TOTAL PROGRAM [\$M TY]	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Current budget (BES-12, etc.)									\$ -		\$ -
NCCA									\$ -		\$ -

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Include a summary of the program's life cycle costs in constant year (CY) and risk and uncertainty adjusted then-year dollars with confidence level noted. If the ground rules and assumptions state that the Life Cycle Cost Estimate (LCCE) will not include all program costs, please reiterate here.

LCC Phase	CY\$s	TY\$s
Development		
Production (X units)		
O&S and Disposal (X units, Y operating years)		
Total		

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Provide a synopsis of the point estimates by WBS or CES in constant year and then-year dollars, including sunk costs. Show the cost risk and uncertainty adjustment as a separate line and note the confidence level. Show these tables separately for each program phase. Examples are shown below. NCCA guidance is to use the appropriate MIL-STD-881C appendix, plus any lower levels of detail the cost estimating team chose to estimate.

Development				
	WBS	Description	CY\$s	TY\$s
	1	System		
	1.1	Prime Mission Product (PMP) 1...n (Specify)		
	1.2	Platform Integration, Assembly, Test and Checkout		
	1.3	System Engineering		
	1.4	Program Management		
	1.5	System Test and Evaluation		
	1.6	Training		
	1.7	Data		
	1.8	Peculiar Support Equipment		
	1.9	Common Support Equipment		
	1.10	Operational/Site Activation		
	1.11	Industrial Facilities		
	1.12	Initial Spares and Repair Parts		
		Total		
		Risk & Uncertainty Adjusted Total		
	Confidence Level:			

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Production				
	WBS	Description	CY\$\$s	TY\$\$s
	1	System		
	1.1	Prime Mission Product (PMP) 1...n (Specify)		
	1.2	Platform Integration, Assembly, Test and Checkout		
	1.3	System Engineering		
	1.4	Program Management		
	1.5	System Test and Evaluation		
	1.6	Training		
	1.7	Data		
	1.8	Peculiar Support Equipment		
	1.9	Common Support Equipment		
	1.10	Operational/Site Activation		
	1.11	Industrial Facilities		
	1.12	Initial Spares and Repair Parts		
		Total		
		Risk & Uncertainty Adjusted Total		
	Confidence Level:			
O&S				
	WBS	Description	CY\$\$s	TY\$\$s
	1.0	Unit-Level Manpower		
	2.0	Unit Operations		
	3.0	Maintenance		
	4.0	Sustaining Support		
	5.0	Continuing System Improvement		
	6.0	Indirect Support		
		Total		
		Risk & Uncertainty Adjusted Total		
	Confidence Level:			

The summary should note any key excursions used to inform management.

Enclosure (1)

1 Introduction

1.1 Purpose and Scope

The intended use determines the purpose of a cost estimate, and its purpose determines its scope and detail. This section of the documentation should provide the intended use, purpose, scope, and level of detail. Most cost estimates have one of three possible purposes:

- a) Help managers evaluate and select alternative systems and solutions.
- b) Support the budget and program management processes by providing estimates of the funding required for efficiently executing the program.
- c) Independently validate an estimate done by another organization on a major program to support major program milestones.

This section should also clearly define the scope of the estimate, highlighting any major interfaces or interdependencies with other programs and activities not included in the scope of the estimate. For example, a communications system estimate might note that the system uses important cryptographic hardware funded by another program or a command and control system might have Government Furnished Equipment (GFE) software funded by other programs. Other examples might include a spiral development where later spirals are discussed but are not included in the program of record or estimate.

1.2 Estimating Team and Cost Estimating Process

Provide a list of the credentials of the personnel directly involved in producing the NCCA cost estimate. At a minimum, provide the following for each member of the cost estimating team, including any subject matter experts: name, Level of education (Bachelor's Degree, Masters Degree, Doctorate), Years of cost estimating experience, Year of other programmatic/technical experience, DAWIA certification level, and SCEA certification. Do not include any personally identifiable information (PII).

Provide the process that was used in developing the cost estimate. This should be based on the six major steps listed in the Department of the Navy Cost Estimating Guide.

1.3 Background

The background section should provide the reader with a good overview of what has happened with the program as it has evolved over time prior to the estimate. The background should discuss previous milestone and/or gate reviews, their associated estimates, and what occurred in those reviews. A good background will give the reader a better understanding of what has occurred in the program and why.

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1.4 System Description

The System Description includes the program's acquisition plan and technical description, including contract type, major subsystems, performance parameters, and support requirements. Use key program documents that underlie estimate inputs, such as the Acquisition Strategy and Cost Analysis Requirements Description (CARD) or CARD-like document.

1.5 Ground Rules and Assumptions

Although often grouped together, there is a subtle difference between ground rules and assumptions. In this section of the documentation, these ground rules and assumptions should be for the overall estimate and general in nature. More specific ground rules assumptions should be included in the appropriate WBS section.

1.5.1 Ground Rules

Ground rules consist of a given set of instructions (e.g., "OSD inflation as of 30 January 2011 will be used."). The program's Work Breakdown Structure (WBS) or Cost Element Structure (CES) and the estimate base year are ground rules. These can be numbered or simply listed.

1.5.2 Assumptions

Assumptions are unknowns filled-in with data that may affect the outcome of the estimate (e.g., "Inflation beyond 2012 will be 2% per year"). The program schedule including milestone events as well as when systems are procured, delivered, and fielded is an assumption and should be included. The use of tables or charts helps to convey the message. Assumptions might also include participating agency support, government versus contractor furnished equipment, and contractor rates, relationships, and profit/fee.

2 Estimating Method and Data by WBS/Cost Element

Each WBS or CES element should be listed here. This section will be the longest section in your documentation, as it details the inputs, formulas, and outputs for each element in your estimate. Present this section in total constant year and non-risk and uncertainty adjusted then-year dollars, as it is simply a depiction of your costing method. Some risk and uncertainty methodology is reported here, but expanded in greater detail in section 4. Note to reader that complete life-cycle cost tables by cost element are available in section 5 which will assist them in reviewing section 2.

2.1 [WBS/Cost Element Name]

2.1.1 WBS Definition

Analysts are expected to use a WBS consistent with the appropriate MIL-STD-881 appendix for the commodity estimated, but expand to as necessary to level of estimation. Include the WBS/Cost Element name as well as a clear definition as to what the cost element means and

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includes. Include the work scope of the effort. The WBS should be broken out by program phase and include appropriate appropriation.

2.1.2 Results

Provide a table of the total cost of the WBS element in constant year and then-year dollars. The estimates in this table are not risk and uncertainty adjusted. The analyst should take care to build the table into the cost models in order to efficiently and effectively build the documentation.

Description	Total
CY\$s	
TY\$s	

WBS Total

2.1.3 Assumptions

Provide specific assumptions applicable to the specific WBS element.

2.1.4 Estimating Methodology

The estimating methodology should be fully explained. The methods described should include the selected approach, any crosschecks developed, and risk and uncertainty considerations. Make sure to include sunk costs. Document the sources for all inputs and data. If using Excel, use adjacent cells or notes to document estimating methodology and sources.

Raw data, whether copies of contractor information or from a database, used for estimating should be included. An appendix to the estimate can include this information, but reference such appendices here so the reader can find them. If referencing other spreadsheets, reports, or documents, please include file name and location in references.

The methodology should be summarized in equation format, allowing for exact replication of estimate from inputs.

Any CER and its derivation should be fully explained along with descriptive statistics explaining the error of the estimate, upper and lower limits of data. The data set should be included. Any external CERs used should include the documented analysis, be clearly referenced, and be placed in the NCCA Library.

Each input to the estimating equation in the analysis should be fully explained. The source of the variable should be disclosed along with the date of the information and reference to the CARD or CARD-like document.

2.1.5 Phasing Methodology

The phasing methodology should be fully explained. Sources for inputs in deciding the phasing methodology should be listed as well. The intent here is to describe the basic phasing methodology to see that it makes sense and is in line with the schedule and other time-sensitive events.

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2.1.6 Risk and Uncertainty Parameters

List the major variables with the associated cost risk and uncertainty parameters here (high, low, most likely). Describe the development of the parameters and selection of distributions. Discuss why these distributions were chosen.

2.1.7 Inflation

Note the inflation index used to convert the estimate for this element to then-year dollars.

3 Risk and Uncertainty Analysis

This is the cumulative effect of risk and uncertainty on the estimate. The major drivers should be fully discussed with cost impacts identified. An “S” curve and other charts should be included as necessary to fully explain the range of potential costs and the associated cost risk and uncertainty. The risk and uncertainty methodology should be fully described. This section should have at least five types of graphs or tables: a summary table by WBS showing point estimate and risk and uncertainty methodology, a table summarizing the resulting forecast values by percentile by appropriation and include the coefficient of variation (CV), a graph of the summary level uncertainty distributions showing confidence levels of the point and risk and uncertainty adjusted cost estimates by appropriation, a table showing the sensitivity analysis of the risk and uncertainty parameters by appropriation, and a chart showing the point estimate and the minimum and maximum values drawn for major cost elements. Note any schedule uncertainty considered.

4 Comparisons to Previous Milestone Estimates

If applicable, provide a comparison of the estimate to previous Milestone estimates. Note the major changes between estimates that have occurred and why.

5 Excursions

Discuss any major excursions that were used to provide information to leadership as part of the presentation of the final estimate. Note the key variables that differed from the baseline.

6 Summary

This is a recap of the point cost estimates by WBS and by year. Separate constant year and then-year tables are to be provided. The then-year risk with uncertainty adjustment should be shown as a separate line and confidence level noted. These tables will be by program phase.

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First year of Development

Constant Year \$s Description	Point Estimate	Sunk Costs			FYXY	FYXY+1	FYXY+2	Etc.
		FYXX	FYXX+1	Etc.				
Development								
Production								
O&S								
Total Point Estimate								
Then-Year s Description	Point Estimate	Sunk Costs			FYXY	FYXY+1	FYXY+2	Etc.
		FYXX	FYXX+1	Etc.				
Development								
Production								
O&S								
Total Point Estimate								
Total Risk & Uncertainty Adjusted								

Provide a landscaped table that displays the complete life-cycle cost estimate in constant year dollars by cost element, by year, including all sunk costs. Provide a second table with the same information in then-year dollars including risk and uncertainty as a separate cost element line. This table will serve as a point of reference for an outside reader reviewing section 2 and simplifies preparation of section 2 by avoiding the need to show the full-time phased cost estimate separately for every cost element.

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Development		Point	Sunk Costs						
Constant Year \$\$		Estimate	FYXX	FYXX+1	Etc.	FYXY	FYXY+1	FYXY+2	Etc.
WBS	Description								
1	System								
1.1	Prime Mission Product (PMP) 1...n (Specify)								
1.1.1	PMP Subsystem 1...n (Specify)								
1.1.1.1	PMP Subsystem Hardware 1...n								
1.1.1.2	PMP Subsystem Software Release 1...n								
1.1.1.3	Subsystem Integration, Assembly, Test and Checkout								
1.1.2	PMP Software Release 1...n (Specify)								
1.1.2.1	Software Product Engineering								
1.1.2.2	Computer Software Configuration Item (CSCI) 1...n								
1.1.2.3	Subsystem Integration, Assembly, Test and Checkout								
1.1.3	PMP Integration, Assembly, Test and Checkout								
1.2	Platform Integration, Assembly, Test and Checkout								
1.3	System Engineering								
1.4	Program Management								
1.5	System Test and Evaluation								
1.5.1	Development Test and Evaluation								
1.5.2	Operational Test and Evaluation								
1.5.3	Mock-ups / System Integration Labs (SILs)								
1.5.4	Test and Evaluation Support								
1.5.5	Test Facilities								
1.6	Training								
1.6.1	Equipment								
1.6.2	Services								
1.6.3	Facilities								
1.7	Data								
1.7.1	Technical Publications								
1.7.2	Engineering Data								
1.7.3	Management Data								
1.7.4	Support Data								
1.7.5	Data Depository								
1.8	Peculiar Support Equipment								
1.8.1	Test and Measurement Equipment								
1.8.2	Support and Handling Equipment								
1.9	Common Support Equipment								
1.9.1	Test and Measurement Equipment								
1.9.2	Support and Handling Equipment								
1.10	Operational/Site Activation								
1.10.1	System Assembly, Installation and Checkout on Site								
1.10.2	Contractor Technical Support								
1.10.3	Site Construction								
1.10.4	Site/Ship/Vehicle Conversion								
1.10.5	Sustainment/Interim Contractor Support								
1.11	Industrial Facilities								
1.11.1	Construction/Conversion/Expansion								
1.11.2	Equipment Acquisition or Modernization								
1.11.3	Maintenance (Industrial Facilities)								
1.12	Initial Spares and Repair Parts								
	Total Point Estimate								
	Total Risk & Uncertainty Adjusted								

Descriptive Title]

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Development									
Then-Year \$s		Point Estimate	Sunk Costs						
WBS	Description		FYXX	FYXX+1	Etc.	FYXY	FYXY+1	FYXY+2	Etc.
1	System								
1.1	Prime Mission Product (PMP) 1...n (Specify)								
1.1.1	PMP Subsystem 1...n (Specify)								
1.1.1.1	PMP Subsystem Hardware 1...n								
1.1.1.2	PMP Subsystem Software Release 1...n								
1.1.1.3	Subsystem Integration, Assembly, Test and Checkout								
1.1.2	PMP Software Release 1...n (Specify)								
1.1.2.1	Software Product Engineering								
1.1.2.2	Computer Software Configuration Item (CSCI) 1...n								
1.1.2.3	Subsystem Integration, Assembly, Test and Checkout								
1.1.3	PMP Integration, Assembly, Test and Checkout								
1.2	Platform Integration, Assembly, Test and Checkout								
1.3	System Engineering								
1.4	Program Management								
1.5	System Test and Evaluation								
1.5.1	Development Test and Evaluation								
1.5.2	Operational Test and Evaluation								
1.5.3	Mock-ups / System Integration Labs (SILs)								
1.5.4	Test and Evaluation Support								
1.5.5	Test Facilities								
1.6	Training								
1.6.1	Equipment								
1.6.2	Services								
1.6.3	Facilities								
1.7	Data								
1.7.1	Technical Publications								
1.7.2	Engineering Data								
1.7.3	Management Data								
1.7.4	Support Data								
1.7.5	Data Depository								
1.8	Peculiar Support Equipment								
1.8.1	Test and Measurement Equipment								
1.8.2	Support and Handling Equipment								
1.9	Common Support Equipment								
1.9.1	Test and Measurement Equipment								
1.9.2	Support and Handling Equipment								
1.10	Operational/Site Activation								
1.10.1	System Assembly, Installation and Checkout on Site								
1.10.2	Contractor Technical Support								
1.10.3	Site Construction								
1.10.4	Site/Ship/Vehicle Conversion								
1.10.5	Sustainment/Interim Contractor Support								
1.11	Industrial Facilities								
1.11.1	Construction/Conversion/Expansion								
1.11.2	Equipment Acquisition or Modernization								
1.11.3	Maintenance (Industrial Facilities)								
1.12	Initial Spares and Repair Parts								
	Total Point Estimate								
	Total Risk & Uncertainty Adjusted								

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Production		Point	Sunk Costs						
Constant Year \$s		Estimate	FYXX	FYXX+1	Etc.	FYXY	FYXY+1	FYXY+2	Etc.
WBS	Description								
1	System								
1.1	Prime Mission Product (PMP) 1...n (Specify)								
1.1.1	PMP Subsystem 1...n (Specify)								
1.1.1.1	PMP Subsystem Hardware 1...n								
1.1.1.2	PMP Subsystem Software Release 1...n								
1.1.1.3	Subsystem Integration, Assembly, Test and Checkout								
1.1.2	PMP Software Release 1...n (Specify)								
1.1.2.1	Software Product Engineering								
1.1.2.2	Computer Software Configuration Item (CSCI) 1...n								
1.1.2.3	Subsystem Integration, Assembly, Test and checkout								
1.1.3	PMP Integration, Assembly, Test and Checkout								
1.2	Platform Integration, Assembly, Test and Checkout								
1.3	System Engineering								
1.4	Program Management								
1.5	System Test and Evaluation								
1.5.1	Development Test and Evaluation								
1.5.2	Operational Test and Evaluation								
1.5.3	Mock-ups / System Integration Labs (SILs)								
1.5.4	Test and Evaluation Support								
1.5.5	Test Facilities								
1.6	Training								
1.6.1	Equipment								
1.6.2	Services								
1.6.3	Facilities								
1.7	Data								
1.7.1	Technical Publications								
1.7.2	Engineering Data								
1.7.3	Management Data								
1.7.4	Support Data								
1.7.5	Data Depository								
1.8	Peculiar Support Equipment								
1.8.1	Test and Measurement Equipment								
1.8.2	Support and Handling Equipment								
1.9	Common Support Equipment								
1.9.1	Test and Measurement Equipment								
1.9.2	Support and Handling Equipment								
1.10	Operational/Site Activation								
1.10.1	System Assembly, Installation and Checkout on Site								
1.10.2	Contractor Technical Support								
1.10.3	Site Construction								
1.10.4	Site/Ship/Vehicle Conversion								
1.10.5	Sustainment/Interim Contractor Support								
1.11	Industrial Facilities								
1.11.1	Construction/Conversion/Expansion								
1.11.2	Equipment Acquisition or Modernization								
1.11.3	Maintenance (Industrial Facilities)								
1.12	Initial Spares and Repair Parts								
	Total Point Estimate								
	Total Risk & Uncertainty Adjusted								

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Production		Point	Sunk Costs						
Then-Year \$s		Estimate	FYXX	FYXX+1	Etc.	FYXY	FYXY+1	FYXY+2	Etc.
WBS	Description								
1	System								
1.1	Prime Mission Product (PMP) 1...n (Specify)								
1.1.1	PMP Subsystem 1...n (Specify)								
1.1.1.1	PMP Subsystem Hardware 1...n								
1.1.1.2	PMP Subsystem Software Release 1...n								
1.1.1.3	Subsystem Integration, Assembly, Test and Checkout								
1.1.2	PMP Software Release 1...n (Specify)								
1.1.2.1	Software Product Engineering								
1.1.2.2	Computer Software Configuration Item (CSCI) 1...n								
1.1.2.3	Subsystem Integration, Assembly, Test and checkout								
1.1.3	PMP Integration, Assembly, Test and Checkout								
1.2	Platform Integration, Assembly, Test and Checkout								
1.3	System Engineering								
1.4	Program Management								
1.5	System Test and Evaluation								
1.5.1	Development Test and Evaluation								
1.5.2	Operational Test and Evaluation								
1.5.3	Mock-ups / System Integration Labs (SILs)								
1.5.4	Test and Evaluation Support								
1.5.5	Test Facilities								
1.6	Training								
1.6.1	Equipment								
1.6.2	Services								
1.6.3	Facilities								
1.7	Data								
1.7.1	Technical Publications								
1.7.2	Engineering Data								
1.7.3	Management Data								
1.7.4	Support Data								
1.7.5	Data Depository								
1.8	Peculiar Support Equipment								
1.8.1	Test and Measurement Equipment								
1.8.2	Support and Handling Equipment								
1.9	Common Support Equipment								
1.9.1	Test and Measurement Equipment								
1.9.2	Support and Handling Equipment								
1.10	Operational/Site Activation								
1.10.1	System Assembly, Installation and Checkout on Site								
1.10.2	Contractor Technical Support								
1.10.3	Site Construction								
1.10.4	Site/Ship/Vehicle Conversion								
1.10.5	Sustainment/Interim Contractor Support								
1.11	Industrial Facilities								
1.11.1	Construction/Conversion/Expansion								
1.11.2	Equipment Acquisition or Modernization								
1.11.3	Maintenance (Industrial Facilities)								
1.12	Initial Spares and Repair Parts								
	Total Point Estimate								
	Total Risk & Uncertainty Adjusted								

Descriptive Title]

[Date]

O&S									
Constant Year \$s		Point Estimate	Sunk Costs						
WBS	Description		FYXX	FYXX+1	Etc.	FYXY	FYXY+1	FYXY+2	Etc.
1.0	Unit-Level Manpower								
1.1	Operation								
1.2	Unit-Level Maintenance								
1.3	Other Unit-Level								
2.0	Unit Operations								
2.1	Operating Material								
2.2	Supporting Services								
2.3	Temporary Duty								
3.0	Maintenance								
3.1	Organizational Maintenance								
3.2	Intermediate Maintainance								
3.3	Depot Maintenance								
4.0	Sustaining Support								
4.1	System Specific Training								
4.2	Support Equipment Replacement								
4.3	Sustaining Engineering and Program Management								
4.4	Other Sustaining Support								
5.0	Continuing System Improvement								
5.1	Hardware Modifications or Modernization								
5.2	Software Maintenance and Modification								
6.0	Indirect Support								
6.1	Installation Support								
6.2	Personnel Support								
6.2.1	Personnel Administration								
6.2.2	Personnel Benefits								
6.2.3	Medical Support								
6.3	General Training and Education								
6.3.1	Basic & Initial Skill Training								
6.3.2	Educational Activities								
	Total Point Estimate								
	Total Risk & Uncertainty Adjusted								

Descriptive Title]

[Date]

O&S										
Then-Year \$s		Point Estimate	Sunk Costs							
WBS	Description		FYXX	FYXX+1	Etc.	FYXY	FYXY+1	FYXY+2	Etc.	
1.0	Unit-Level Manpower									
1.1	Operation									
1.2	Unit-Level Maintenance									
1.3	Other Unit-Level									
2.0	Unit Operations									
2.1	Operating Material									
2.2	Supporting Services									
2.3	Temporary Duty									
3.0	Maintenance									
3.1	Organizational Maintenance									
3.2	Intermediate Maintainance									
3.3	Depot Maintenance									
4.0	Sustaining Support									
4.1	System Specific Training									
4.2	Support Equipment Replacement									
4.3	Sustaining Engineering and Program Management									
4.4	Other Sustaining Support									
5.0	Continuing System Improvement									
5.1	Hardware Modifications or Modernization									
5.2	Software Maintenance and Modification									
6.0	Indirect Support									
6.1	Installation Support									
6.2	Personnel Support									
6.2.1	Personnel Administration									
6.2.2	Personnel Benefits									
6.2.3	Medical Support									
6.3	General Training and Education									
6.3.1	Basic & Initial Skill Training									
6.3.2	Educational Activities									
	Total Point Estimate									
	Total Risk & Uncertainty Adjusted									

Appendix (2)

Enclosure (1)

Documentation with Excel

In the Government Accountability Office's Cost Estimating and Assessment Guide, the GAO states that documentation can be completed in other acceptable ways, including spreadsheets with cell notes and hyperlinks to other documents. The important thing to consider is whether the documentation allows an analyst to trace the data, calculations, modeling assumptions, and rationale back to a source document in sufficient detail to replicate the estimate from the source data.

Because of its flexibility, Excel requires significant time and effort to set up. Taking the time and forethought to set the spreadsheet up in a user-friendly manner will make the analyst's future revisions, presentations, and documentation far easier.

Structure of Excel Cost Estimates

Excel spreadsheet should be organized in a consistent manner that allows tables or other information to be copied to the documentation document. A good practice is to organize the spreadsheet using the tabs as follows:

- Title page.
- Revision history.
- Introduction. This includes cost estimate purpose, the estimating team, background, system description, and ground rules and assumptions in a text boxes.
- Inputs. Organize into categories such as schedule, escalation, development, production, O&S. Include cost risk uncertainty parameters and correlation tables.
- Summary & Outputs. This tab includes a summary of Individual WBS cost elements in constant year and then-year dollars, by year. Analysts may customize additional outputs as needed to understand the results, convey results, and write documentation.
- Individual WBSs. Have a tab for each WBS or CES element for which an estimate is being prepared. Organize into development, production and O&S phases. A best practice is to have a common output area at the top of the tab where the costs for the element are summed. Include specific ground rules and assumptions relating to the WBS element. Also, include cost risk parameters for areas of risk and uncertainty.
- Risk Outputs. This is a series of tabs that include the Risk Report (showing risk distributions by WBS), Tornado Chart, Sensitivity Chart, and S-Curve.
- Data. This tab includes raw or processed data from database or other sources.

Documenting in Excel

Thorough documentation should accompany estimate. Use Comments or Text Boxes to clarify non-obvious operations, methodologies and sources. Use a Revisions Tab to catalog changes.

Enclosure (1)

Use Data-Checks wherever possible to validate calculations. Using Range Names can assist in tracing the logic of equations in an estimate. The analyst needs to be cautious when adding content from other models to the cost model as the same range name may be already in use.

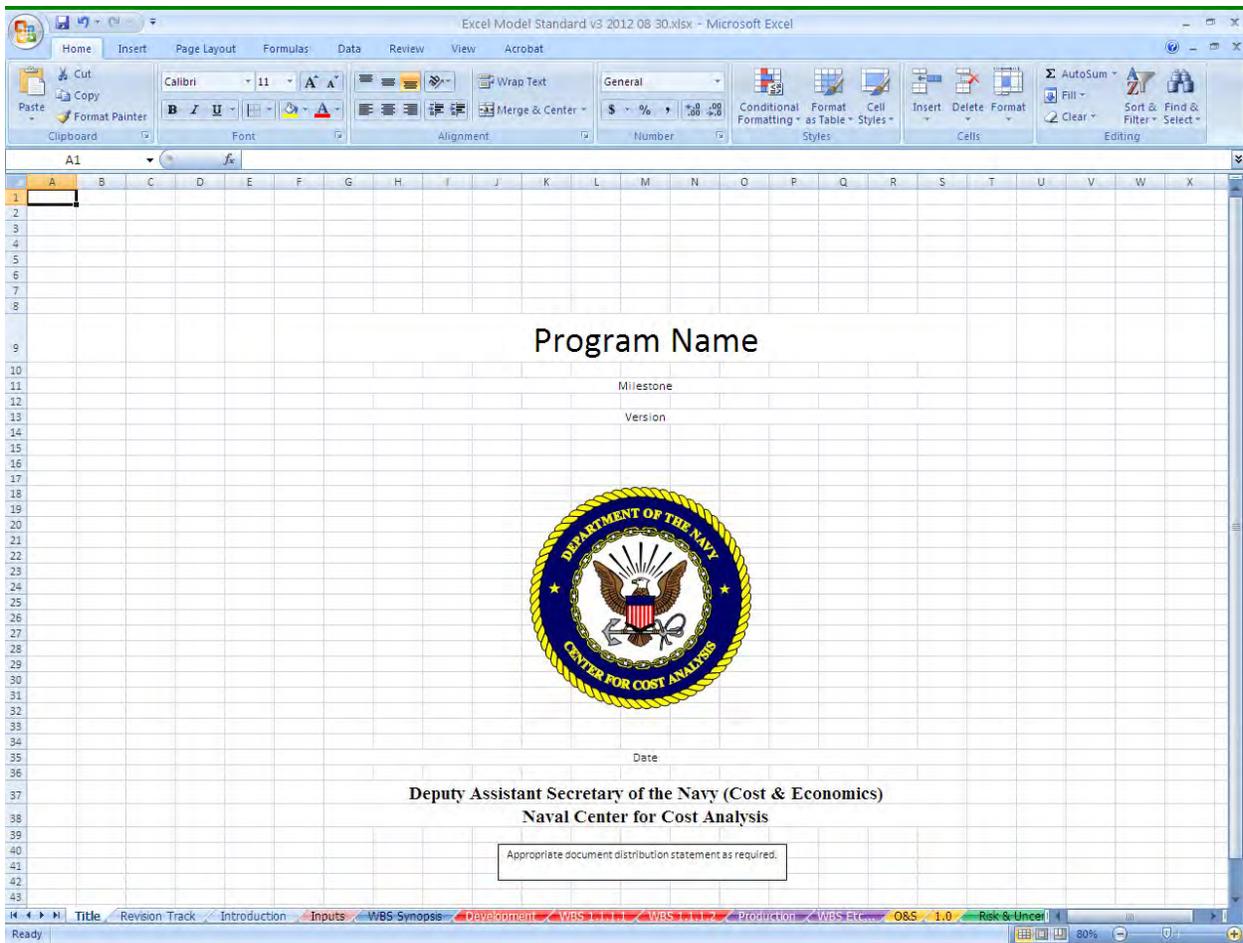
It is a good practice to use font colors to identify categories of numbers in the spreadsheet. For example:

- Hard input: Black
- Linked input: Blue
- Equation: Green

Hard coded numbers should mainly be inputs and inflation indices with most other inputs being dynamically related to those inputs.

The following is an example of an Excel-based cost estimate with tab organization.

Below is an example of the Title page Tab:



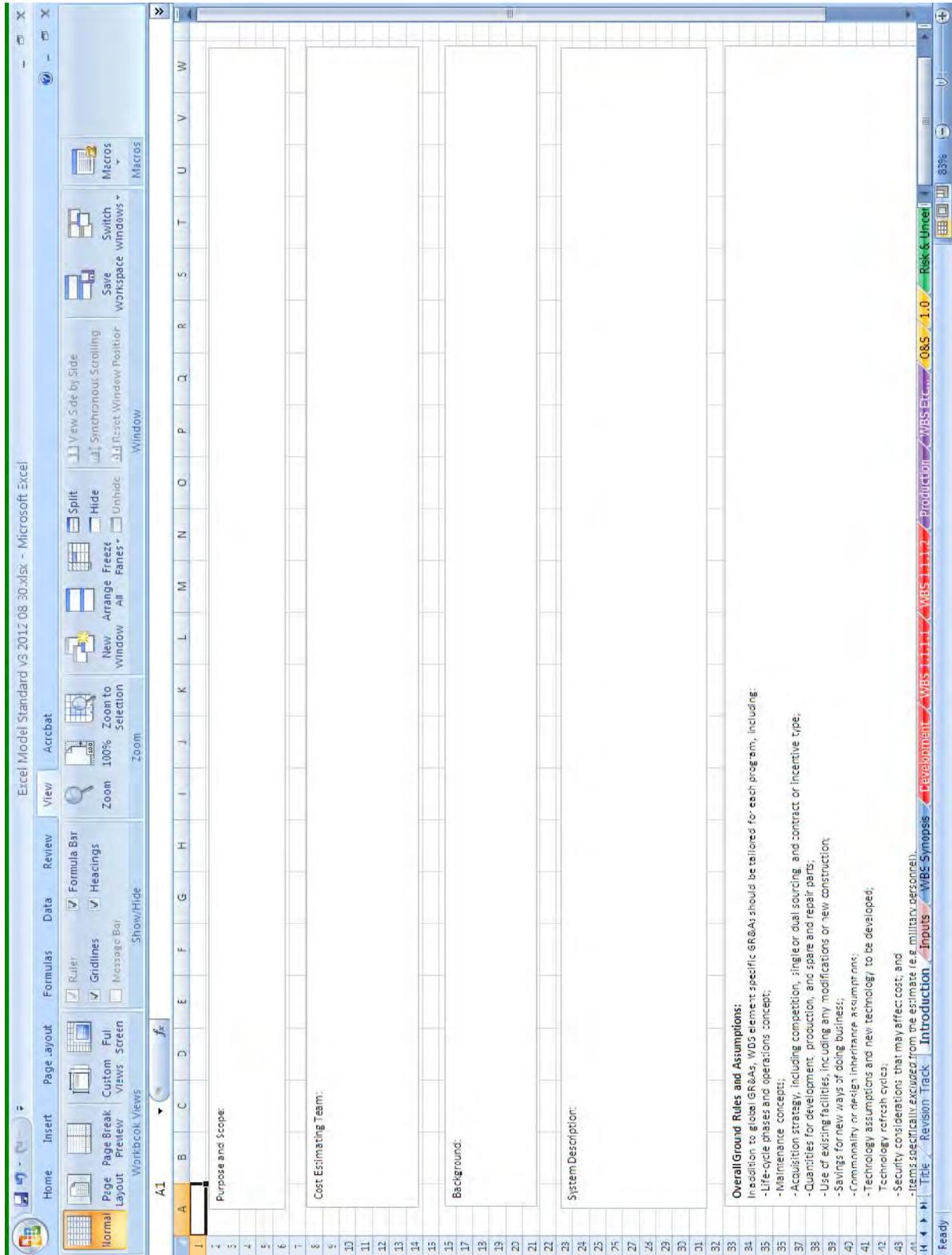
Enclosure (1)

Below is an example of the Revisions Tab:

	A	B	C	D	E	F	G	H
1								
2		Revision Track						
3	Date	Revision	PREVIOUS LCC (TYSK)	New LCC (TYSK)	LCC Delta (TYSK)	LCC Delta (%)	Worksheets Affected	POC
4	1/24/2012	WBS 1.2 from \$250M to \$271M based on updated from STARS/PRISM Financial database.	303.3	324.3	21	6.9%	Inputs	Intern Bob
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								

Enclosure (1)

Below is an example of the Introduction Tab:



Enclosure (1)

Below is an example of the Inputs Tab including cost risk and uncertainty. Other formats can accomplish the same purpose:

	A	B	C	D	E	F	G	H	I
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

Enclosure (1)

Below are example cost estimate summaries that can be included in the WBS Summary Tab:

Total Program											
Funding and ICE Comparison as of ...											
	Prior	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY11-16	To Complete	Total
RDT&E [\$M TY]											
Current budget (BES-12, etc.)									\$ -		\$ -
NCCA									\$ -		\$ -
Delta (BES-12 - NCCA)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	N/A	N/A
Procurement (APN 1/6, SCN, OPN, WPN, PANMC) [\$M TY]											
Current budget (BES-12, etc.)									\$ -		\$ -
NCCA									\$ -		\$ -
Delta (BES-12 - NCCA)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	N/A	N/A
APN 5 [\$M TY]											
Current budget (BES-12, etc.)									\$ -		\$ -
NCCA									\$ -		\$ -
Delta (BES-12 - NCCA)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	N/A	N/A
MILCON [\$M TY]											
Current budget (BES-12, etc.)									\$ -		\$ -
NCCA									\$ -		\$ -
Delta (BES-12 - NCCA)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	N/A	N/A
O&M [\$M TY]											
Current budget (BES-12, etc.)									\$ -		\$ -
NCCA									\$ -		\$ -
Delta (BES-12 - NCCA)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	N/A	N/A
QUANTITIES											
Current budget (BES-12, etc.)									0		0
NCCA									0		0
Delta (BES-12 - NCCA)	0	0	0	0	0	0	0	0	0	N/A	N/A
TOTAL PROGRAM [\$M TY]	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Current budget (BES-12, etc.)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
NCCA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Production				
			CY\$s	TY\$s
	WBS	Description		
	1	System		
	1.1	Prime Mission Product (PMP) 1...n (Specify)		
	1.2	Platform Integration, Assembly, Test and Checkout		
	1.3	System Engineering		
	1.4	Program Management		
	1.5	System Test and Evaluation		
	1.6	Training		
	1.7	Data		
	1.8	Peculiar Support Equipment		
	1.9	Common Support Equipment		
	1.10	Operational/Site Activation		
	1.11	Industrial Facilities		
	1.12	Initial Spares and Repair Parts		
		Total		
		Risk & Uncertainty Adjusted Total		
O&S				
	WBS	Description	CY\$s	TY\$s
	1.0	Unit-Level Manpower		
	2.0	Unit Operations		
	3.0	Maintenance		
	4.0	Sustaining Support		
	5.0	Continuing System Improvement		
	6.0	Indirect Support		
		Total		
		Risk & Uncertainty Adjusted Total		

The following summary tables can be included in the Development Tab.

Development		Point	Sunk Costs						
Constant Year \$s		Estimate	FYXX	FYXX+1	Etc.	FYXY	FYXY+1	FYXY+2	Etc.
WBS	Description								
1	System								
1.1	Prime Mission Product (PMP) 1...n (Specify)								
1.1.1	PMP Subsystem 1...n (Specify)								
1.1.1.1	PMP Subsystem Hardware 1...n								
1.1.1.2	PMP Subsystem Software Release 1...n								
1.1.1.3	Subsystem Integration, Assembly, Test and Checkout								
1.1.2	PMP Software Release 1...n (Specify)								
1.1.2.1	Software Product Engineering								
1.1.2.2	Computer Software Configuration Item (CSCI) 1...n								
1.1.2.3	Subsystem Integration, Assembly, Test and Checkout								
1.1.3	PMP Integration, Assembly, Test and Checkout								
1.2	Platform Integration, Assembly, Test and Checkout								
1.3	System Engineering								
1.4	Program Management								
1.5	System Test and Evaluation								
1.5.1	Development Test and Evaluation								
1.5.2	Operational Test and Evaluation								
1.5.3	Mock-ups / System Integration Labs (SILs)								
1.5.4	Test and Evaluation Support								
1.5.5	Test Facilities								
1.6	Training								
1.6.1	Equipment								
1.6.2	Services								
1.6.3	Facilities								
1.7	Data								
1.7.1	Technical Publications								
1.7.2	Engineering Data								
1.7.3	Management Data								
1.7.4	Support Data								
1.7.5	Data Depository								
1.8	Peculiar Support Equipment								
1.8.1	Test and Measurement Equipment								
1.8.2	Support and Handling Equipment								
1.9	Common Support Equipment								
1.9.1	Test and Measurement Equipment								
1.9.2	Support and Handling Equipment								
1.10	Operational/Site Activation								
1.10.1	System Assembly, Installation and Checkout on Site								
1.10.2	Contractor Technical Support								
1.10.3	Site Construction								
1.10.4	Site/Ship/Vehicle Conversion								
1.10.5	Sustainment/Interim Contractor Support								
1.11	Industrial Facilities								
1.11.1	Construction/Conversion/Expansion								
1.11.2	Equipment Acquisition or Modernization								
1.11.3	Maintenance (Industrial Facilities)								
1.12	Initial Spares and Repair Parts								
	Total Point Estimate								
	Total Risk & Uncertainty Adjusted								

Development		Point	Sunk Costs							
Then-Year \$s		Estimate	FYXX	FYXX+1	Etc.	FYXY	FYXY+1	FYXY+2	Etc.	
WBS	Description									
1	System									
1.1	Prime Mission Product (PMP) 1...n (Specify)									
1.1.1	PMP Subsystem 1...n (Specify)									
1.1.1.1	PMP Subsystem Hardware 1...n									
1.1.1.2	PMP Subsystem Software Release 1...n									
1.1.1.3	Subsystem Integration, Assembly, Test and Checkout									
1.1.2	PMP Software Release 1...n (Specify)									
1.1.2.1	Software Product Engineering									
1.1.2.2	Computer Software Configuration Item (CSCI) 1...n									
1.1.2.3	Subsystem Integration, Assembly, Test and Checkout									
1.1.3	PMP Integration, Assembly, Test and Checkout									
1.2	Platform Integration, Assembly, Test and Checkout									
1.3	System Engineering									
1.4	Program Management									
1.5	System Test and Evaluation									
1.5.1	Development Test and Evaluation									
1.5.2	Operational Test and Evaluation									
1.5.3	Mock-ups / System Integration Labs (SILs)									
1.5.4	Test and Evaluation Support									
1.5.5	Test Facilities									
1.6	Training									
1.6.1	Equipment									
1.6.2	Services									
1.6.3	Facilities									
1.7	Data									
1.7.1	Technical Publications									
1.7.2	Engineering Data									
1.7.3	Management Data									
1.7.4	Support Data									
1.7.5	Data Depository									
1.8	Peculiar Support Equipment									
1.8.1	Test and Measurement Equipment									
1.8.2	Support and Handling Equipment									
1.9	Common Support Equipment									
1.9.1	Test and Measurement Equipment									
1.9.2	Support and Handling Equipment									
1.10	Operational/Site Activation									
1.10.1	System Assembly, Installation and Checkout on Site									
1.10.2	Contractor Technical Support									
1.10.3	Site Construction									
1.10.4	Site/Ship/Vehicle Conversion									
1.10.5	Sustainment/Interim Contractor Support									
1.11	Industrial Facilities									
1.11.1	Construction/Conversion/Expansion									
1.11.2	Equipment Acquisition or Modernization									
1.11.3	Maintenance (Industrial Facilities)									
1.12	Initial Spares and Repair Parts									
	Total Point Estimate									
	Total Risk & Uncertainty Adjusted									

The following summary tables can be included in the Production Tab.

Production		Point	Sunk Costs						
Constant Year \$s		Estimate	FYXX	FYXX+1	Etc.	FYXY	FYXY+1	FYXY+2	Etc.
WBS	Description								
1	System								
1.1	Prime Mission Product (PMP) 1...n (Specify)								
1.1.1	PMP Subsystem 1...n (Specify)								
1.1.1.1	PMP Subsystem Hardware 1...n								
1.1.1.2	PMP Subsystem Software Release 1...n								
1.1.1.3	Subsystem Integration, Assembly, Test and Checkout								
1.1.2	PMP Software Release 1...n (Specify)								
1.1.2.1	Software Product Engineering								
1.1.2.2	Computer Software Configuration Item (CSCI) 1...n								
1.1.2.3	Subsystem Integration, Assembly, Test and checkout								
1.1.3	PMP Integration, Assembly, Test and Checkout								
1.2	Platform Integration, Assembly, Test and Checkout								
1.3	System Engineering								
1.4	Program Management								
1.5	System Test and Evaluation								
1.5.1	Development Test and Evaluation								
1.5.2	Operational Test and Evaluation								
1.5.3	Mock-ups / System Integration Labs (SILs)								
1.5.4	Test and Evaluation Support								
1.5.5	Test Facilities								
1.6	Training								
1.6.1	Equipment								
1.6.2	Services								
1.6.3	Facilities								
1.7	Data								
1.7.1	Technical Publications								
1.7.2	Engineering Data								
1.7.3	Management Data								
1.7.4	Support Data								
1.7.5	Data Depository								
1.8	Peculiar Support Equipment								
1.8.1	Test and Measurement Equipment								
1.8.2	Support and Handling Equipment								
1.9	Common Support Equipment								
1.9.1	Test and Measurement Equipment								
1.9.2	Support and Handling Equipment								
1.10	Operational/Site Activation								
1.10.1	System Assembly, Installation and Checkout on Site								
1.10.2	Contractor Technical Support								
1.10.3	Site Construction								
1.10.4	Site/Ship/Vehicle Conversion								
1.10.5	Sustainment/Interim Contractor Support								
1.11	Industrial Facilities								
1.11.1	Construction/Conversion/Expansion								
1.11.2	Equipment Acquisition or Modernization								
1.11.3	Maintenance (Industrial Facilities)								
1.12	Initial Spares and Repair Parts								
	Total Point Estimate								
	Total Risk & Uncertainty Adjusted								

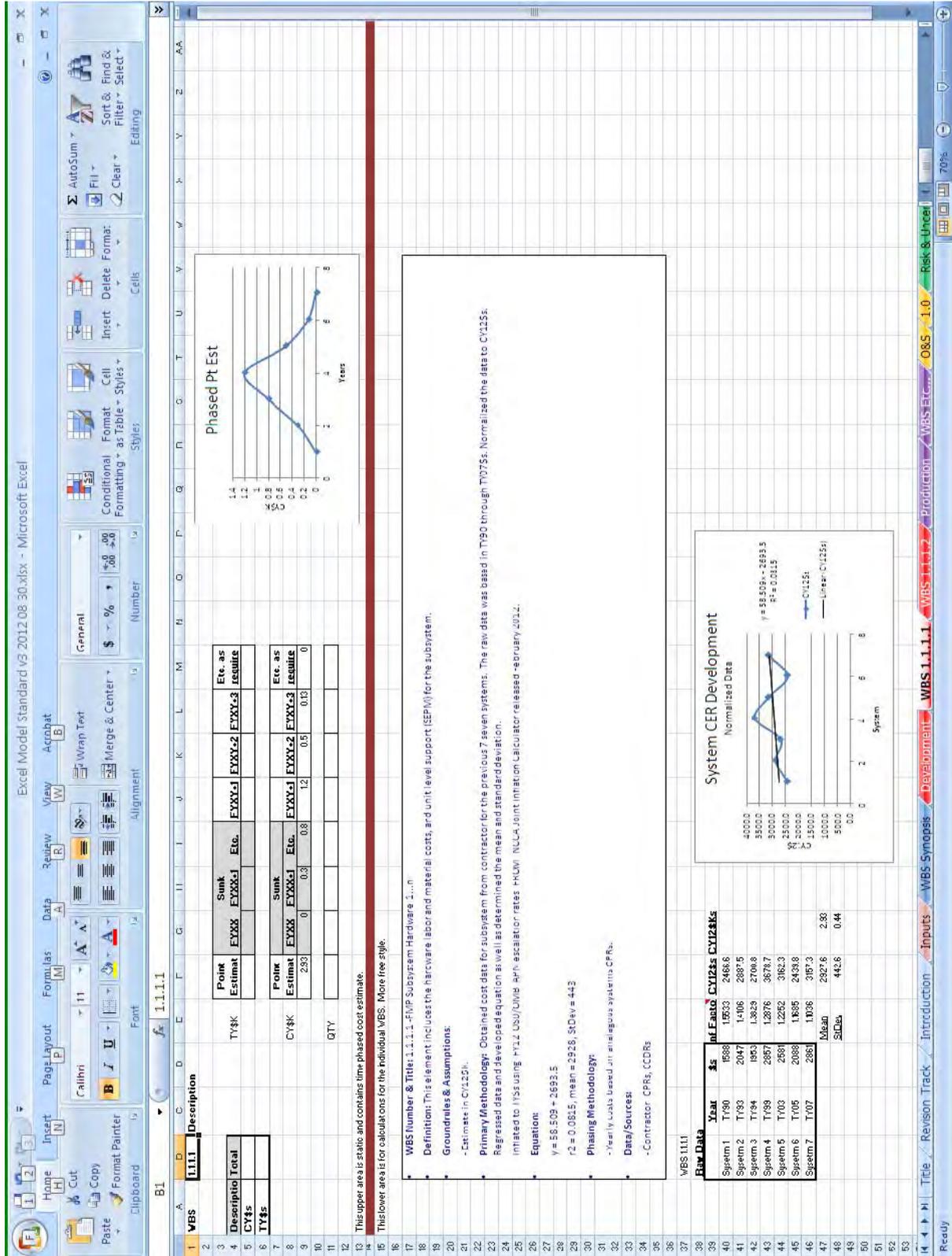
Then-Year \$s		Point	Sunk Costs						
WBS	Description	Estimate	FYXX	FYXX+1	Etc.	FYXY	FYXY+1	FYXY+2	Etc.
1	System								
1.1	Prime Mission Product (PMP) 1...n (Specify)								
1.1.1	PMP Subsystem 1...n (Specify)								
1.1.1.1	PMP Subsystem Hardware 1...n								
1.1.1.2	PMP Subsystem Software Release 1...n								
1.1.1.3	Subsystem Integration, Assembly, Test and Checkout								
1.1.2	PMP Software Release 1...n (Specify)								
1.1.2.1	Software Product Engineering								
1.1.2.2	Computer Software Configuration Item (CSCI) 1...n								
1.1.2.3	Subsystem Integration, Assembly, Test and checkout								
1.1.3	PMP Integration, Assembly, Test and Checkout								
1.2	Platform Integration, Assembly, Test and Checkout								
1.3	System Engineering								
1.4	Program Management								
1.5	System Test and Evaluation								
1.5.1	Development Test and Evaluation								
1.5.2	Operational Test and Evaluation								
1.5.3	Mock-ups / System Integration Labs (SILs)								
1.5.4	Test and Evaluation Support								
1.5.5	Test Facilities								
1.6	Training								
1.6.1	Equipment								
1.6.2	Services								
1.6.3	Facilities								
1.7	Data								
1.7.1	Technical Publications								
1.7.2	Engineering Data								
1.7.3	Management Data								
1.7.4	Support Data								
1.7.5	Data Depository								
1.8	Peculiar Support Equipment								
1.8.1	Test and Measurement Equipment								
1.8.2	Support and Handling Equipment								
1.9	Common Support Equipment								
1.9.1	Test and Measurement Equipment								
1.9.2	Support and Handling Equipment								
1.10	Operational/Site Activation								
1.10.1	System Assembly, Installation and Checkout on Site								
1.10.2	Contractor Technical Support								
1.10.3	Site Construction								
1.10.4	Site/Ship/Vehicle Conversion								
1.10.5	Sustainment/Interim Contractor Support								
1.11	Industrial Facilities								
1.11.1	Construction/Conversion/Expansion								
1.11.2	Equipment Acquisition or Modernization								
1.11.3	Maintenance (Industrial Facilities)								
1.12	Initial Spares and Repair Parts								
	Total Point Estimate								
	Total Risk & Uncertainty Adjusted								

The following summary tables can be included in the O&S Tab.

O&S		Point	Sunk Costs							
Constant Year \$s		Estimate	FYXX	FYXX+1	Etc.	FYXY	FYXY+1	FYXY+2	Etc.	
WBS	Description									
1.0	Unit-Level Manpower									
1.1	Operation									
1.2	Unit-Level Maintenance									
1.3	Other Unit-Level									
2.0	Unit Operations									
2.1	Operating Material									
2.2	Supporting Services									
2.3	Temporary Duty									
3.0	Maintenance									
3.1	Organizational Maintenance									
3.2	Intermediate Maintainance									
3.3	Depot Maintenance									
4.0	Sustaining Support									
4.1	System Specific Training									
4.2	Support Equipment Replacement									
4.3	Sustaining Engineering and Program Management									
4.4	Other Sustaining Support									
5.0	Continuing System Improvement									
5.1	Hardware Modifications or Modernization									
5.2	Software Maintenance and Modification									
6.0	Indirect Support									
6.1	Installation Support									
6.2	Personnel Support									
6.2.1	Personnel Administration									
6.2.2	Personnel Benefits									
6.2.3	Medical Support									
6.3	General Training and Education									
6.3.1	Basic & Initial Skill Training									
6.3.2	Educational Activities									
	Total Point Estimate									
	Total Risk & Uncertainty Adjusted									

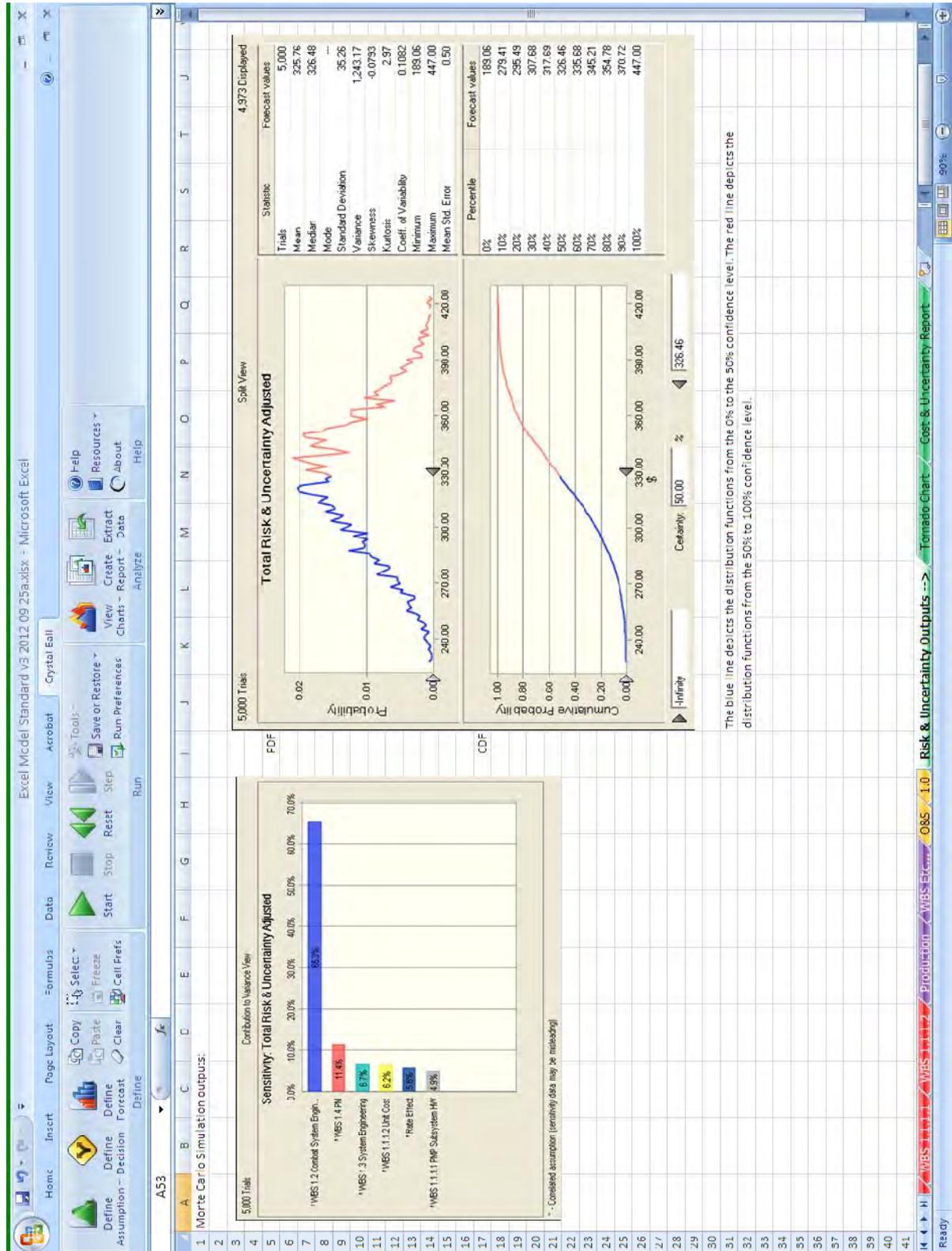
O&S									
Then-Year \$s		Point Estimate	Sunk Costs			FYXY	FYXY+1	FYXY+2	Etc.
WBS	Description		FYXX	FYXX+1	Etc.				
1.0	Unit-Level Manpower								
1.1	Operation								
1.2	Unit-Level Maintenance								
1.3	Other Unit-Level								
2.0	Unit Operations								
2.1	Operating Material								
2.2	Supporting Services								
2.3	Temporary Duty								
3.0	Maintenance								
3.1	Organizational Maintenance								
3.2	Intermediate Maintenance								
3.3	Depot Maintenance								
4.0	Sustaining Support								
4.1	System Specific Training								
4.2	Support Equipment Replacement								
4.3	Sustaining Engineering and Program Management								
4.4	Other Sustaining Support								
5.0	Continuing System Improvement								
5.1	Hardware Modifications or Modernization								
5.2	Software Maintenance and Modification								
6.0	Indirect Support								
6.1	Installation Support								
6.2	Personnel Support								
6.2.1	Personnel Administration								
6.2.2	Personnel Benefits								
6.2.3	Medical Support								
6.3	General Training and Education								
6.3.1	Basic & Initial Skill Training								
6.3.2	Educational Activities								
	Total Point Estimate								
	Total Risk & Uncertainty Adjusted								

Below is an example of one of the individual WBS Tabs:



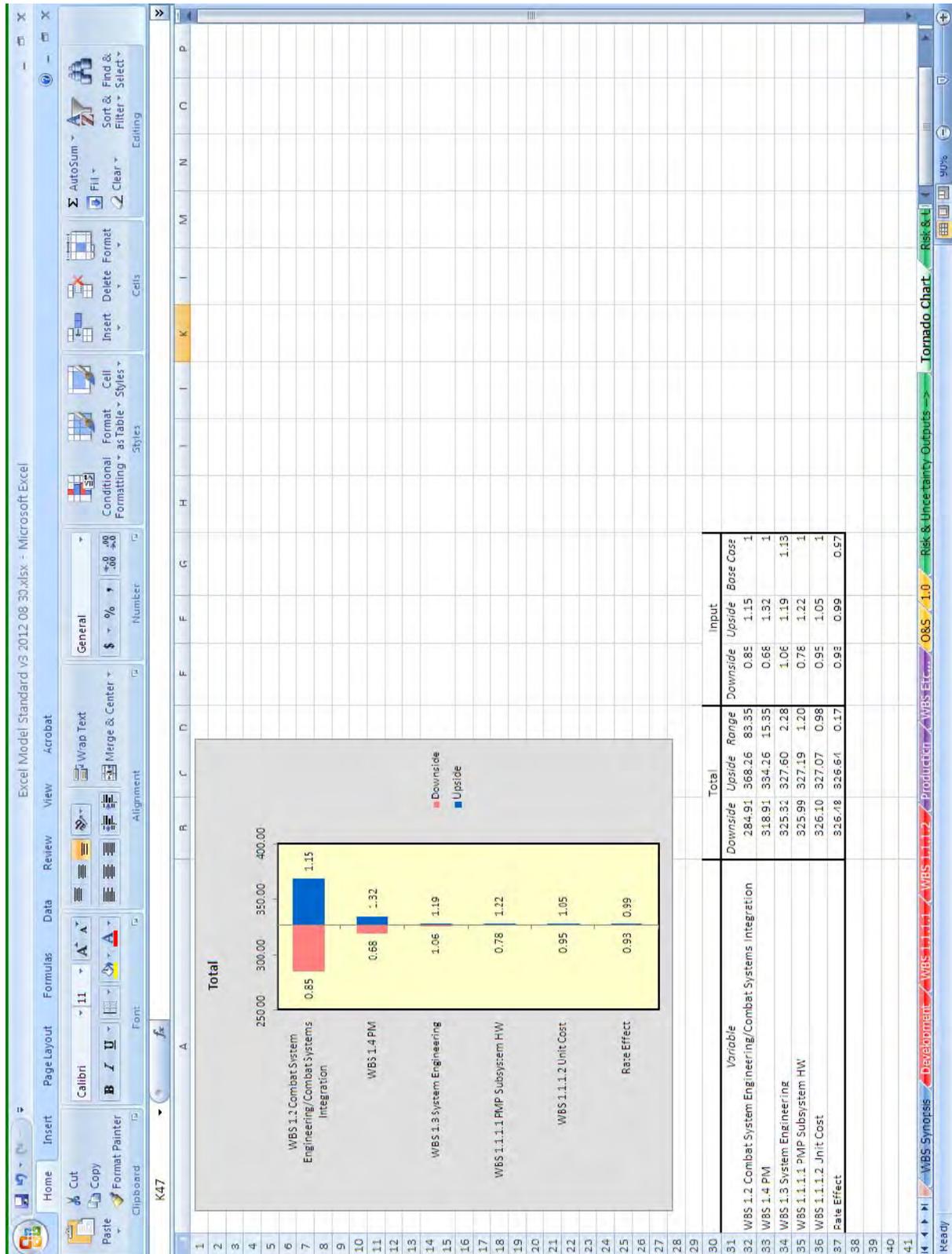
Enclosure (1)

Below is an example of the Cost Risk and Uncertainty Outputs Tab:



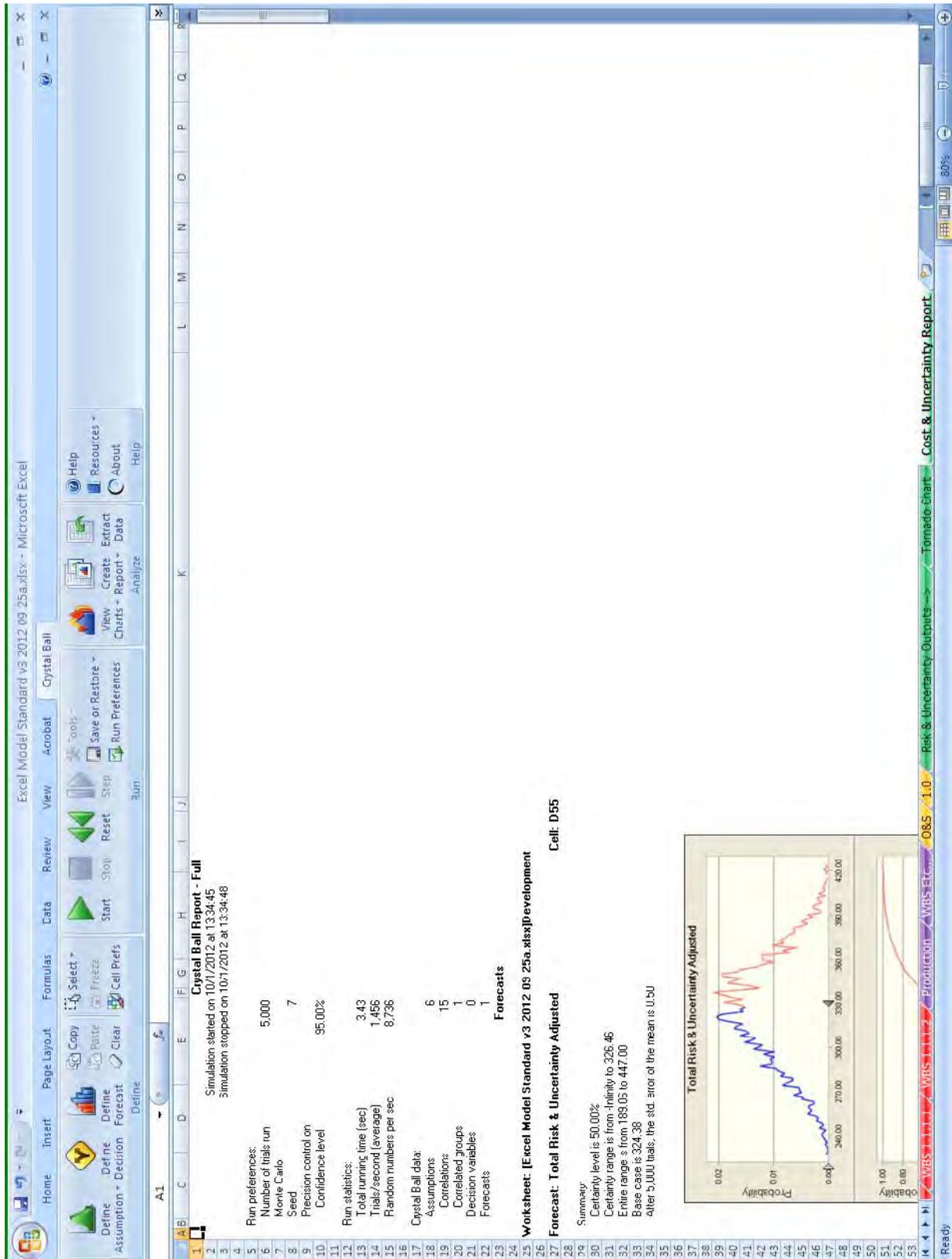
Enclosure (1)

Below is an example of the Risk Tornado Tab:



Enclosure (1)

Below is an example of the Cost Risk and Uncertainty Report Tab.



Enclosure (1)

Excel Model Standard v3 2012 08 30.xlsx - Microsoft Excel

Home Insert Page Layout Formulas Data Review View Acrobat

Clipboard Paste Copy Format Painter MS Sans Serif 10 A A

Font Bold Italic Underline Color Fill Background Color

Alignment Merge & Center

Styles Conditional Formatting as Table Cell Styles

Cell Insert Delete Format

Editing AutoSum Fill Sort & Filter Select Clear

End of Forecasts

Assumptions

Worksheet: [Excel Model Standard.xlsx]Inputs

Assumption: Hake Effect **Cell: B19**

Beta distribution with parameters:

Minimum	0.00	(=D19)
Maximum	1.00	(=E19)
Alpha	55	(=F19)
Beta	2	(=H19)



Assumption: WBS 1.1.1.1 PMP Subsystem HW **Cell: B4**

Correlated with:

- WBS 1.4PM (B16)
- WBS 1.1.1.1 PMP Subsystem HW (B4)
- WBS 1.3System Engineering (B13)
- WBS 1.2Combat System Engineering/Combat Systems Integr
- WBS 1.1.1.2 Unit Cost (B7)

Coefficient	0.25	(=G\$32)
	0.25	(=H\$28)
	0.25	(=I\$31)
	0.25	(=J\$30)
	0.25	(=K\$28)

Norma distribution with parameters:

Mean	1.00	(=O4)
Std Dev.	0.17	(=E4)



Assumption: WBS 1.1.1.2 Unit Cost **Cell: B7**

Correlated with:

- WBS 1.1.1.2 Unit Cost (B7)
- Rate Effect (B19)
- WBS 1.3System Engineering (B13)
- WBS 1.2Combat System Engineering/Combat Systems Integr
- WBS 1.4PM (B16)

Coefficient	0.25	(=M\$28)
	0.25	(=N\$28)
	0.25	(=O\$28)
	0.25	(=P\$28)

Ready