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Systems Engineering Affordability Tracking (SEAT) System

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Overview

- Systems Engineering Affordability Tracking (SEAT) System
- Affordability Overview
- Implementation
- The Model
- Reports and Analyses
- Next Steps
- Summary

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Systems Engineering Affordability Tracking (SEAT) System

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Systems Engineering Affordability Tracking

- **Is a Process & Tool to Help Produce a More Affordable System**
- **Helps Identify Affordability Goals**
- **Defines and Measures Progress**
  - Identifies “Problem” Areas
- **Covers All Phases of a Program**
- **Tracks Variety of Targets**
  - Cost, Schedule, Performance, Risks, Issues and Opportunities
- **Provides information for Cost Effectiveness Trades**
  - to identify Best-Value Solutions

Objective: To provide Management and Engineers with program status & decision-making capabilities via target tracking & trade results

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Benefits of SEAT

- **Differs from Cost Tracking & Earned Value Management**
  - Expanded Duration
    - Can cover entire program from early conception through operations and disposal
    - Has the ability to highlight ripple effects of current situation to future phases of program
  - Broad Target Set
    - Cost, Schedule, Performance, Risks, Issues and Opportunities
  - Is Easily Integrated with Trade Studies and Risk Management Processes
    - Performance/Design Targets
      - Such as via Cost Effectiveness Modeling Tools
    - Risk, Issue, Opportunity
  - Affordability Focus
    - Considers “best value” instead of lowest cost

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Affordability Overview

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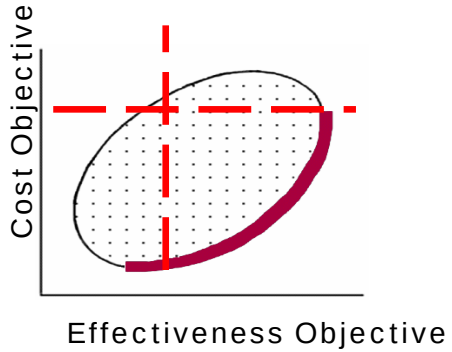
What is Affordability?

- **Ongoing assessment of a program to ensure it is "in consonance with the long-range investment … plans"***
  - Meets funding guidelines
  - Satisfies requirements
  - Sufficient resources exist



- **A process that helps**
  - Arrive at cost objectives
  - Set performance objectives with the requirements community
  - Define and integrate a balanced set of requirements
    - Cost, schedule, performance, and risk
- **Includes CAIV (Cost as an Independent Variable)**

*DAU Glossary of Defense Acquisition Acronyms and Terms, 12th Edition

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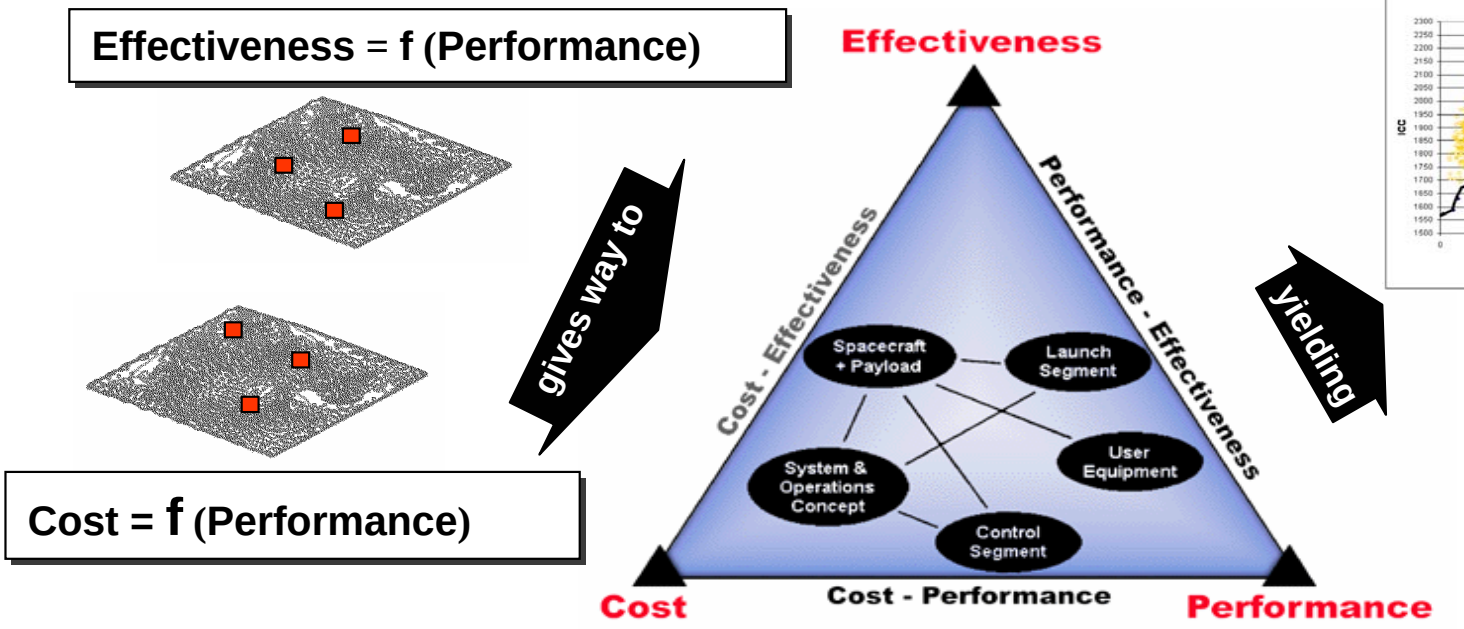
Affordability Helps Manage your Program

- **Assists with trade studies**
  - Thoroughly surveys and assesses trade space
    - Not point designs



  - Identifies “best-value” candidates or “Biggest Bang for the Buck”
    - Quantitative assessment of optimal solutions of effectiveness and cost

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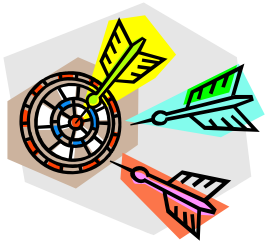
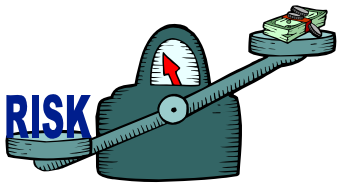
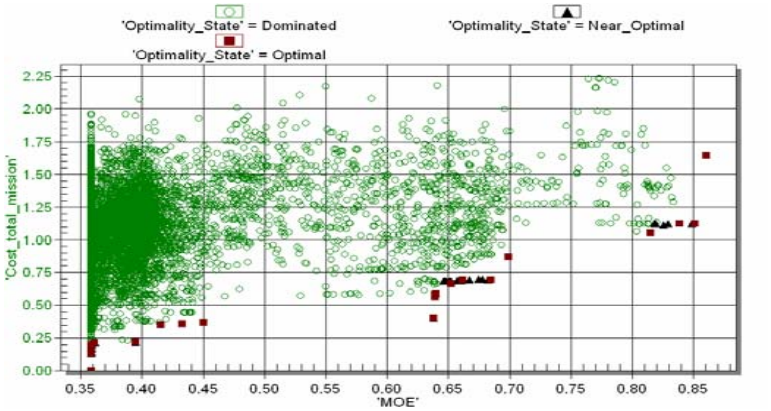
Examples of Affordability Tasks



- Integrate Customer Requirements & Expectations
- Develop Affordability Initiatives and Program Goals
- Generate, allocate and track Life Cycle Cost (LCC) Estimates
- Perform Cost Driver Analysis
- Implement Cost Risk Analysis (Cost, Schedule, Technical)
- Integrate with Program Risk Management
- Conduct Integrated (Cost-Performance) Trades





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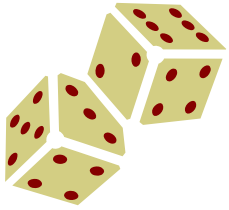
Affordability Targets

- **Cost Targets $$$**
  - Are Derived from Estimates
    - Estimates provide the starting point

- **Schedule Targets (Deadlines)**
  - Percent Ahead/Behind
  - Milestones, IOC, FOC, First Launch
  - Schedule Variance (SV, SPI)

- **Risks, Issues, and Opportunities (RIOs) Impacts**
  - Increased Costs / Savings
  - Schedule Delays / Acceleration
  - Technical/Design Modifications & Maturity Levels
  - Risk Reduction Efforts
  - Demonstrations



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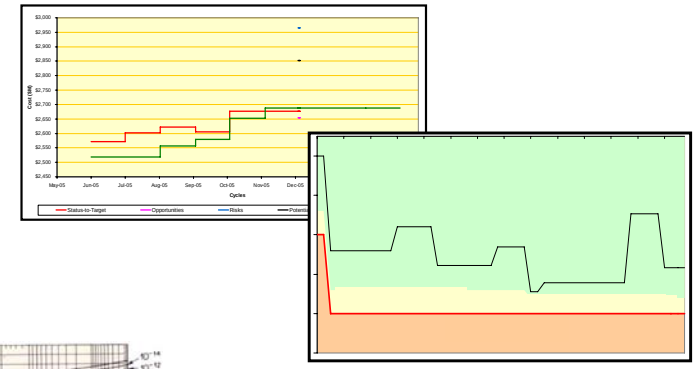
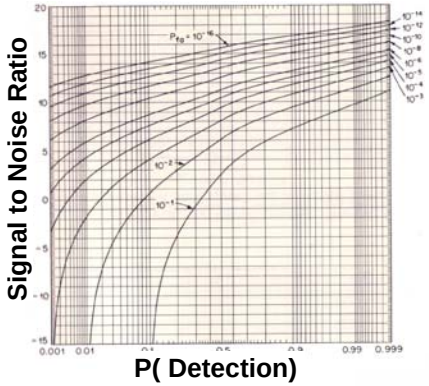
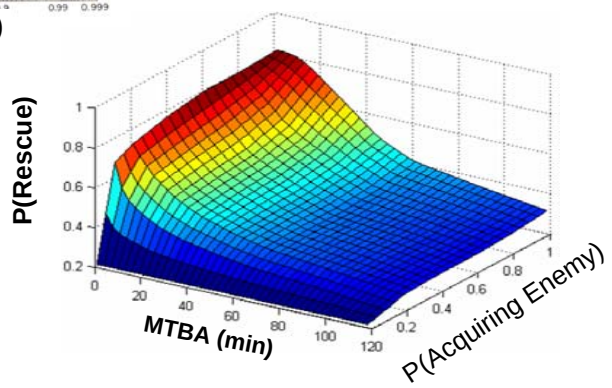
Performance Targets

- **Performance/Design Targets**
  - Technical Performance Measures (TPMs)
    - Weight Allotments
    - KSLOC / Growth
    - Design Life / Mean Mission Duration
    - Power, BOL, EOL
    - Signal Availability
    - Constellation Coverage
  - Threshold/Objective
- **Measures of Effectiveness**
  - Failure Rate, Reliability
  - Revisit Rate, Mean time between access
  - Probability of Survival, Rescue, Evasion







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SEAT Implementation

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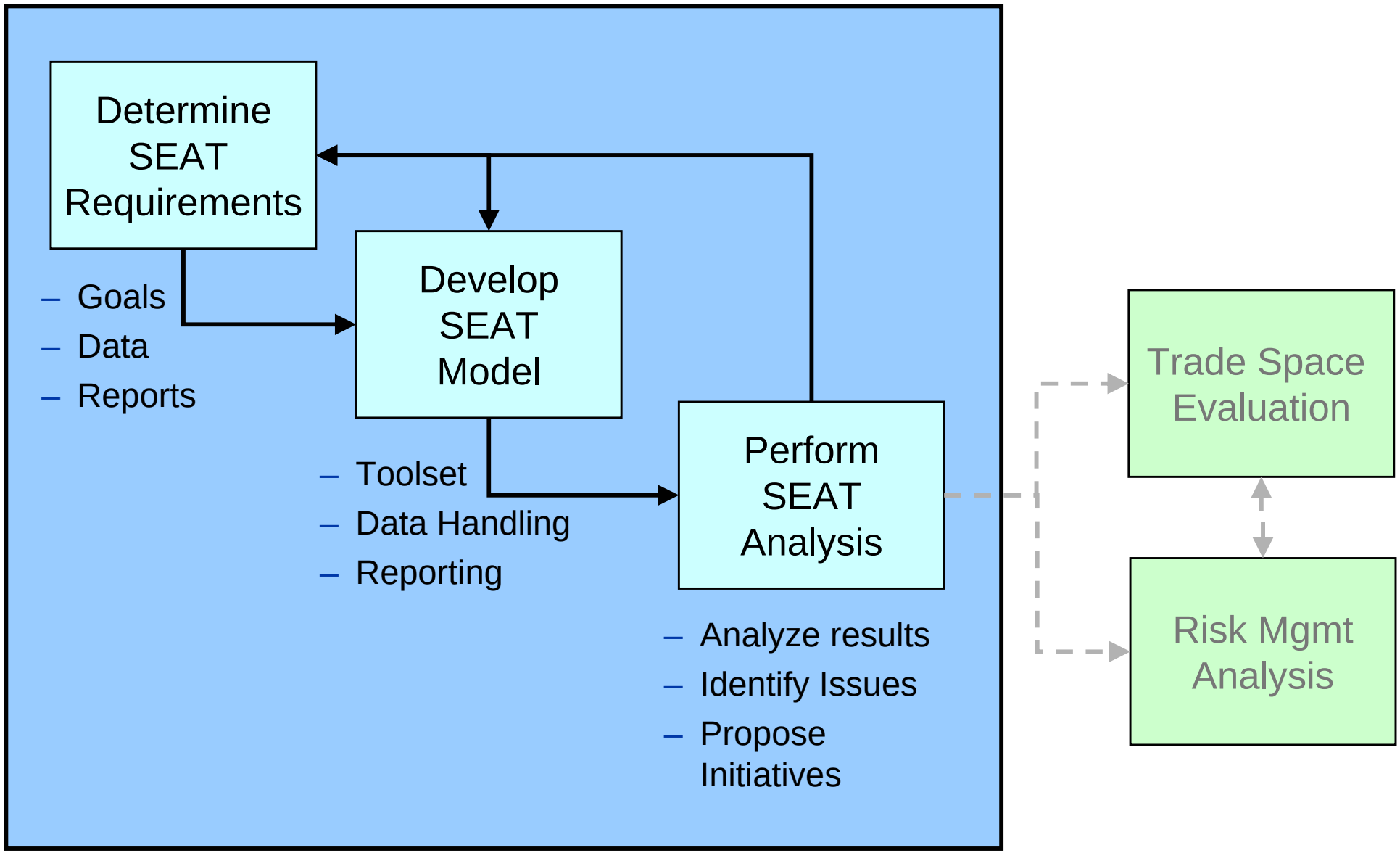
Steps to Implement SEAT



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SEAT – Determine Requirements

- **What are the goals?**
  - Define Goals & Set Targets
    - Program Cost of $100K
    - Schedule acceleration of 6 months
    - Increase “Y” MOE by 5%
    - Implement 2 Risk Reduction Demos
- **Are goals feasible?**
  - Format of Data
    - May need to modify goals
- **How to measure progress against goals?**
  - Reports: type, data, frequency

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SEAT – Develop Model

- **Create Model**
  - Toolset
    - Excel, ACEIT, Design Sheet, Homegrown, etc.
  - Reports
    - Canned, Customizable, Templates
  - Training / documentation
    - Pre-existing, Experts, Learning Curve
- **Data Collection**
  - Data handling & storage
    - Import, key in, cut & paste, automated
    - Excel columns, Data Bases, GUIs
  - Updates
    - Override existing data
    - Keep historical trends
- **Create reports**

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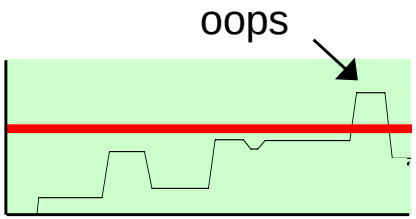
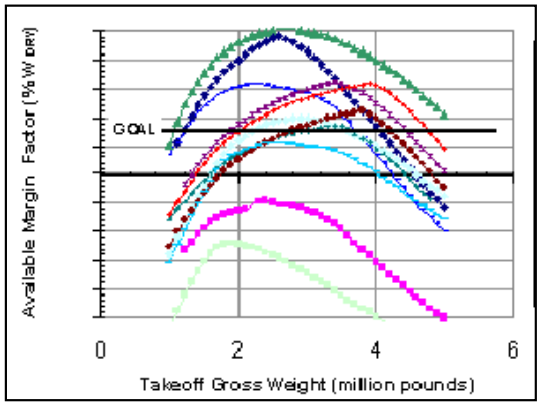
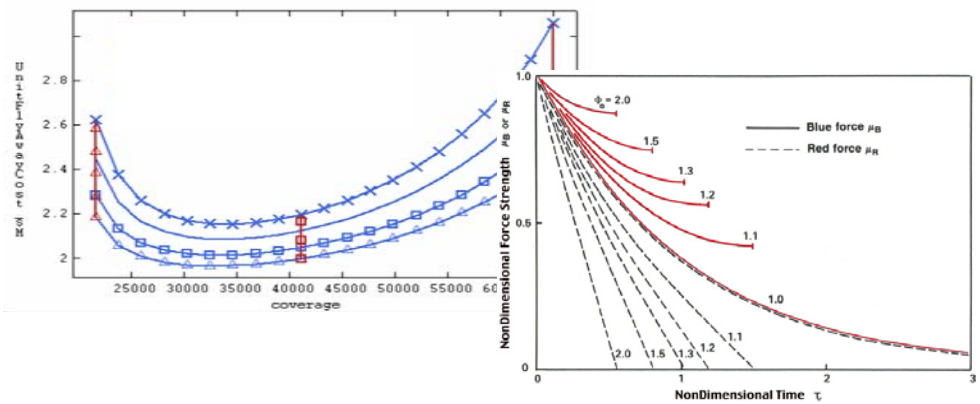
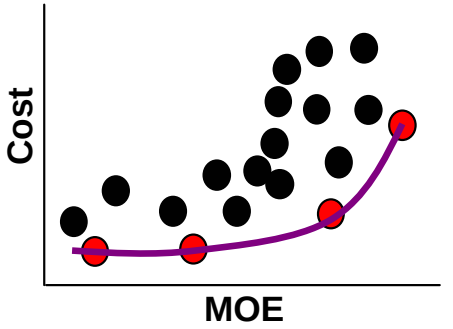
SEAT – Perform Analysis

- **Show trends**
  - Over/under runs
  - Comparison to targets
- **Identify Problem Areas**
- **Propose Affordability Measures**
  - Design & Cost-effectiveness trades
  - Risk Reduction Demos
  - Opportunity Investments









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The Model

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SEAT Model Structure

- **Three Main Sections**
  - Targets Section
    - Costs, Performance, Schedule
  - CERs Section
    - Cost Estimating Relationships
  - Risk/Opportunity Section
    - Impacts of
      - Additional Costs / Schedule Slips (R)
      - Cost/Schedule Savings (O)
    - Currently not implemented

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Targets Section

- **Targets Section contains targets and updated projections of**
  - Costs (EACs) organized by WBS at Subsystem level
    - Phased and Total
  - Design & Performance Parameters by applicable WBS
  - Schedule Data
- **Targets / Projections Assumptions**
  - Targets Fixed
    - Not expected to change, but may be re-baselined
    - Targets saved as baseline case and act as Point of Departure
  - Projections Updated Periodically
    - Throughout life cycle
    - Projections Configuration Controlled by Review Boards
    - Each update stored separately to allow for case by case analysis

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Targets Section: Targets

WBS/CES Description	Units Comment	Equation / Throughput	Baseline	Unique ID	Approp	Phasing Method	Start Date	Finish Date
* Total Cost TARGETS				*Target2				

WBS/CES Description	Units Comment	Equation / Throughput	Baseline	Comments	Unique ID
* WEIGHT TARGETS					*Wts

WBS/CES Description	Units Comment	Equation / Throughput	Baseline	Comments	Unique ID
*Dates Targets					*DATES22
Dev Start Date		01MAY2007	01MAY2007 *		ST_DT_D
Dev End Date		30SEP2010	30SEP2010 *		END_DT_D
Prod Start Date		01OCT2008	01OC		ST_DT_P
Prod End Date		30SEP2012	30SE		END_DT_P
O&S Start Date		01OCT2009	01OCT2009 *		ST_DT_O
O&S End Date		30SEP2017	30SEP2017 *		END_DT_O

Schedule

L Band Suite	lb	100	100.0 *		LBAND_WT
Atomic Frequency Standard (AFS)	lb	15	15.0 *		AFS_WT
Xlink Communication Suite	lb	100	100.0 *		XLINK_WT
PL Antenna System	lb	100	100.0 *		ANT_WT
* Performance TARGETS					*Perf
Spacevehicle Performance			490.8 *		
Data Processor	ms	200	200.0 *	Greater than	
Transmitter	w	50	50.0 *	greater than	
Receiver	w	200	200.0 *	Less than	
SV Reliability	%	.80	0.8 *	Greater than	
MMD	yrs	40	40.0 *	Greater than	

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Targets Section: Projections (Total)

	WBS/CES Description	Baseline	Jan2007	Feb2007	Mar2007	Apr2007	Oct2009	Jan2010
17	* Total Cost TARGETS							
18	Targets - Program Level Costs	2741.68 *	2745.13 *	2747.33 *	2750.39 *	2750.79 *	2907.11 *	2867.64 *
19								
20	Development Target	99.90 *	103.31 *	105.55 *	108.61 *	109.01 *	115.54 *	116.52 *
21	Space Vehicle	99.90 *	103.31 *	105.55 *	108.61 *	109.01 *	115.54 *	116.52 *
22	Space Vehicle PMSE	13.98 *	14.60 *	14.88 *	15.29 *	15.42 *	18.42 *	18.56 *
23	Space Vehicle Program Management	6.60 *	6.93 *	7.06 *	7.26 *	7.39 *	8.85 *	8.92 *
24	Space Vehicle System Engineering	7.38 *	7.67 *	7.82 *	8.03 *	8.03 *	9.57 *	9.64 *
25	Space Vehicle AIT	5.10 *	5.36 *	5.46 *	5.56 *	5.56 *	6.08 *	6.13 *
26	Spacecraft Bus	38.00 *	39.17 *					43.26 *
27	Spacecraft Bus SEPM, I&T	3.10 *	3.20 *					3.63 *
28	Structures and Mechanisms	6.40 *	6.59 *					7.23 *
29	Thermal Control	2.70 *	2.78 *					3.00 *
30	Electric Power System (EPS)	5.70 *	5.87 *	6.16			6.33 *	6.38 *
31	Attitude Determination & Control (ADC)	2.30 *	2.38 *	2.40 *	2.46 *	2.46 *	2.54 *	2.56 *
32	Propulsion Sub System	1.30 *	1.35 *	1.36 *	1.39 *	1.39 *	1.46 *	1.47 *
33	Tracking, Telemetry & Command (TT&C)	6.50 *	6.70 *	6.84 *	7.10 *	7.10 *	7.23 *	7.29 *
34	Bus SW	10.00 *	10.30 *	10.50 *	10.90 *	10.90 *	11.60 *	11.70 *
35	Payloads	26.10 *	26.88 *	27.51 *	28.18 *	28.34 *	29.50 *	29.75 *
36	PL SEPM, I&T	4.20 *	4.32 *	4.41 *	4.62 *	4.62 *	4.91 *	4.95 *
37	Data Processor	12.40 *	12.77 *	13.02 *	13.27 *	13.27 *	13.64 *	13.76 *
38	L Band Suite	5.40 *	5.56 *	5.78 *	5.89 *	6.05 *	6.32 *	6.37 *
39	Atomic Frequency Standard (AFS)	0.60 *	0.62 *	0.63 *	0.64 *	0.64 *	0.66 *	0.67 *
40	Xlink Communication Suite	1.50 *	1.55 *	1.59 *	1.62 *	1.62 *	1.75 *	1.76 *
41	PL Antenna System	2.00 *	2.06 *	2.08 *	2.14 *	2.14 *	2.22 *	2.24 *
42	ILS	11.30 *	11.63 *	11.87 *	12.22 *	12.22 *	12.55 *	12.65 *
43	Space Vehicle Storage	1.20 *	1.23 *	1.26 *	1.30 *	1.30 *	1.33 *	1.34 *
44	Training	6.20 *	6.38 *	6.51 *	6.70 *	6.70 *	6.88 *	6.94 *
45	Support Equipment	3.90 *	4.02 *	4.10 *	4.22 *	4.22 *	4.34 *	4.37 *
46	LV Integration	2.10 *	2.17 *	2.19 *	2.25 *	2.25 *	2.34 *	2.36 *
47	Launch Ops	3.40 *	3.50 *	3.53 *	3.64 *	3.64 *	3.74 *	3.81 *

Periodic Updates In columns

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CERs Section

- **CERs Section contains**
  - Performance (weight/power) based CERs
  - Cost on cost equations
  - To show relative impacts of design changes on cost
    - Expected cost delta with weight increase on Weight-based CERs
    - Expected cost of refresh decrease with life expectancy increase
  - To promote analytical thinking and CER development
    - Do the above impacts reflect the updated projections?
- **CERs Assumptions**
  - CERs in model accurately estimate the targets

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CERs Section

Targets

WBS/CES Description	Units Comment	Equation / Throughput	Baseline	Ph Me	Baseline	te	Finish Date
* CERs							
CERs			2741.61 *		2741.68 *		
Development Target			**99.83** *		**99.90** *		
Space Vehicle			99.83 *		99.90 *		
Space Vehicle PMSE			13.90 *		13.90 *		
Space Vehicle Program Management	$K	0.174*SV_BUS_D_CER	6.59 *		6.60 *	_D	END_DT_D
Space Vehicle System Engineering	$K	0.193*SV_BUS_D_CER	7.31 *		7.30 *	_D	END_DT_D
Space Vehicle AIT	$K	0.135*SV_BUS_D_CER	5.11 *		5.10 *	_D	END_DT_D
Spacecraft Bus			37.88 *		38.00 *		
Spacecraft Bus SEPM, I&T	$K	0.125*(STR_D_CER + THRM_D_CER + EPS_D_CER + ADC_D_CER + PROP_D_CER + TTC_D_CER)	3.10 *		3.10 *	_D	END_DT_D
Structures and Mechanism		2.5 * STR_WT ^ 0.15	6.35 *		6.40 *	_D	END_DT_D
Thermal Control		1.6 * THRM_WT ^ 0.1	2.72 *		2.70 *	_D	END_DT_D
Electric Power System		0.042 * EPS_WT ^ 0.71	5.67 *		5.70 *	_D	END_DT_D
Attitude Determination & Control		0.85 * ADC_WT ^ 0.2	2.32 *		2.30 *	_D	END_DT_D
Propulsion Sub System	$K	0.048 * PROP_WT ^ 0.6	1.32 *		1.30 *	_D	END_DT_D
Tracking, Telemetry & Command (TT&	$K	0.00054 * TTC_WT ^ 2.4	6.46 *		6.50 *	_D	END_DT_D
Bus SW	$K	0.401*(STR_D_CER + THRM_D_CER + EPS_D_CER + ADC_D_CER + PROP_D_CER + TTC_D_CER)	9.95 *		10.00 *	_D	END_DT_D
Payloads			26.11 *		26.10 *		
PL SEPM, I&T	$K	0.19*(DP_D_CER + LBAND_D_CER +	4.17 *		4.20 *	_D	END_DT_D
Data Processor	$K	2.13 * DP_WT ^ 0.45	12.39 *		12.40 *	_D	END_DT_D
L Band Suite	$K	1.88 * LBAND_WT ^ 0.23	5.42 *		5.40 *	_D	END_DT_D
Atomic Frequency Standard (AFS)	$K	.28 * AFS_WT ^ 0.296	0.62 *		0.60 *	_D	END_DT_D
Xlink Communication Suite	$K	.73 * XLINK_WT ^ 0.157	1.50 *		1.50 *	_D	END_DT_D
PL Antenna System		0.022 * ANT_WT ^ 0.98	2.01 *		2.00 *	_D	END_DT_D
ILS			11.32 *		11.30 *		
Space Vehicle Storage	$K	0.0033*PL_WT	1.20 *		1.20 *	_D	END_DT_D
Training	$K	0.017*PL_WT	6.21 *		6.20 *	_D	END_DT_D
Support Equipment	$K	0.0107*PL_WT	3.91 *		3.90 *	_D	END_DT_D
LV Integration	$K	0.0058*PL_WT	2.12 *		2.10 *	_D	END_DT_D
Launch Ops	$K	0.0093*PL_WT	3.39 *		3.40 *	_D	END_DT_D

CERs

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Data Analysis

- **Periodic Updates Stored as Sensitivity Cases**
- **Sensitivity Cases Can Be Compared to Baseline Targets**
  - EACs Compared to Cost Targets
  - Weights/Power Updates Compared to Baseline Parameters
  - Schedule Changes Compared to Baseline Schedule
- **Sensitivity Cases Compared to Parametric Costs (CERs)**
  - EACs Compared to Updated CER Costs based on Updated Parameters
- **Risk/Opportunity Impacts Compared to Baseline/EACs**
  - Acts as a Check-and-Balance
    - Risk Impacts / Cost Savings Reflected in EACs?

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SEAT Reports and Analyses

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Sample Cost Targets – Phased

- Development Phase Shown
- By WBS At Subsystem Level
- Phased over 4 years
  - According to program schedule
- Then Year $
- Color Coding:
  - Yellow – child
  - White – parent

Cost Element	Total	FY2007	FY2008	FY2009	FY2010
Development Target	99.9	6.2	40.9	38.5	14.3
Space Vehicle	99.9	6.2	40.9	38.5	14.3
Space Vehicle PMSE	13.9	0.9	5.7	5.4	2.0
Space Vehicle Program Management	6.6	0.4	2.7	2.5	0.9
Space Vehicle System Engineering	7.3	0.5	3.0	2.8	1.0
Space Vehicle AIT	5.1	0.3	2.1	2.0	0.7
Spacecraft Bus	38	2.4	15.6	14.6	5.4
Spacecraft Bus SEPM, I&T	3.1	0.2	1.3	1.2	0.4
Structures and Mechanisms	6.4	0.4	2.6	2.5	0.9
Thermal Control	2.7	0.2	1.1	1.0	0.4
Electric Power System (EPS)	5.7	0.4	2.3	2.2	0.8
Attitude Determination & Control (ADC)	2.3	0.1	0.9	0.9	0.3
Propulsion Sub System	1.3	0.1	0.5	0.5	0.2
Tracking, Telemetry & Command (TT&C)	6.5	0.4	2.7	2.5	0.9
Bus SW	10	0.6	4.1	3.9	1.4
Payloads	26.1	1.6	10.7	10.0	3.7
PL SEPM, I&T	4.2	0.3	1.7	1.6	0.6
Data Processor	12.4	0.8	5.1	4.8	1.8
L Band Suite	5.4	0.3	2.2	2.1	0.8
Atomic Frequency Standard (AFS)	0.6	0.0	0.2	0.2	0.1
Xlink Communication Suite	1.5	0.1	0.6	0.6	0.2
PL Antenna System	2	0.1	0.8	0.8	0.3
ILS	11.3	0.7	4.6	4.4	1.6
Space Vehicle Storage	1.2	0.1	0.5	0.5	0.2
Training	6.2	0.4	2.5	2.4	0.9
Support Equipment	3.9	0.2	1.6	1.5	0.6
LV Integration	2.1	0.1	0.9	0.8	0.3
Launch Ops	3.4	0.2	1.4	1.3	0.5

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Sample Development Cost Projection

- Dated March 2007
  - Month End Data
  - 3 months after ATP
- EAC Data
  - Then Yr $
- Can be compared to
  - Phased Cost Targets
  - Unphased Totals

$K BY 2007	Mar 2007 Projection				
Cost Element	FY 2007	FY 2008	FY 2009	FY 2010	Total
Program Level Projection					
Development Projection	8.64	43.96	40.96	14.99	108.54
Space Vehicle					
Space Vehicle PMSE					
Space Vehicle Program Management	0.66	2.90	2.71	0.99	7.26
Space Vehicle System Engineering	0.73	3.21	2.99	1.10	8.03
Space Vehicle AIT	0.46	2.24	2.09	0.77	5.56
Spacecraft Bus					
Spacecraft Bus SEPM, I&T	0.31	1.36	1.27	0.47	3.41
Structures and Mechanisms	0.58	2.82	2.62	0.96	6.98
Thermal Control	0.24	1.19	1.11	0.41	2.94
Electric Power System (EPS)	0.57	2.51	2.34	0.86	6.27
Attitude Determination & Control (ADC)	0.16	1.01	0.94	0.35	2.46
Propulsion Sub System	0.09	0.57	0.53	0.20	1.39
Tracking, Telemetry & Command (TT&C	0.59	2.86	2.67	0.98	7.09
Bus SW	0.90	4.40	4.10	1.50	10.90
Payloads					
PL SEPM, I&T	0.42	1.85	1.72	0.63	4.62
Data Processor	0.87	5.46	5.08	1.86	13.27
L Band Suite	0.49	2.38	2.21	0.81	5.89
Atomic Frequency Standard (AFS)	0.04	0.26	0.25	0.09	0.64
Xlink Communication Suite	0.11	0.66	0.62	0.23	1.61
PL Antenna System	0.14	0.88	0.82	0.30	2.14
ILS					
Space Vehicle Storage	0.10	0.53	0.49	0.18	1.30
Training	0.50	2.73	2.54	0.93	6.70
Support Equipment	0.31	1.72	1.60	0.59	4.21
LV Integration	0.15	0.92	0.86	0.32	2.25
Launch Ops	0.24	1.50	1.39	0.51	3.64

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Sample Delta Report Over Time

- Difference between Unphased Targets and Updated Monthly Projections
- Shows Progression of Delta Costs
  - From Jan 2007 through Oct 2009
- Color Coding Highlights Problem Areas

Costs in BY2007 $K										
WBS	Target		Jan-2007		Feb-2007		Mar-2007		Apr-2007	…	Oct-2009
Program Level	2741.68		2745.13		2747.33		2750.39		2750.79		2907.11
Development	99.90		103.31		105.55		108.61		109.01		115.54
Space Vehicle	99.90		103.31		105.55		108.61		109.01		115.54
Space Vehicle PMSE	13.90		14.60		14.88		15.29		15.42		18.42
Space Vehicle Program Management	6.60		6.93		7.06		7.26		7.39		8.85
Space Vehicle System Engineering	7.30		7.67		7.82		8.03		8.03		9.57
Space Vehicle AIT	5.10		5.36		5.46		5.56		5.56		6.08
Spacecraft Bus	38.00		39.17		40.11		41.47		41.58		42.91
Spacecraft Bus SEPM, I&T	3.10		3.20		3.29		3.41		3.41		3.60
Structures and Mechanisms	6.40		6.59		6.72		6.98		6.98		7.17
Thermal Control	2.70		2.78		2.84		2.95		2.95		2.98
Electric Power System (EPS)	5.70		5.87		6.16		6.28		6.39		6.33
Attitude Determination & Control (ADC)	2.30		2.38		2.40		2.46		2.46		2.54
Propulsion Sub System	1.30		1.35		1.36		1.39		1.39		1.46
Tracking, Telemetry & Command (TT&C)	6.50		6.70		6.84		7.10		7.10		7.23
Bus SW	10.00		10.30		10.50		10.90		10.90		11.60
Payloads	26.10		26.88		27.51		28.18		28.34		29.50
PL SEPM, I&T	4.20		4.32		4.41		4.62		4.62		4.91
Data Processor	12.40		12.77		13.02		13.27		13.27		13.64
L Band Suite	5.40		5.56		5.78		5.89		6.05		6.32
Atomic Frequency Standard (AFS)	0.60		0.62		0.63		0.64		0.64		0.66
Xlink Communication Suite	1.50		1.55		1.59		1.62		1.62		1.75
PL Antenna System	2.00		2.06		2.08		2.14		2.14		2.22

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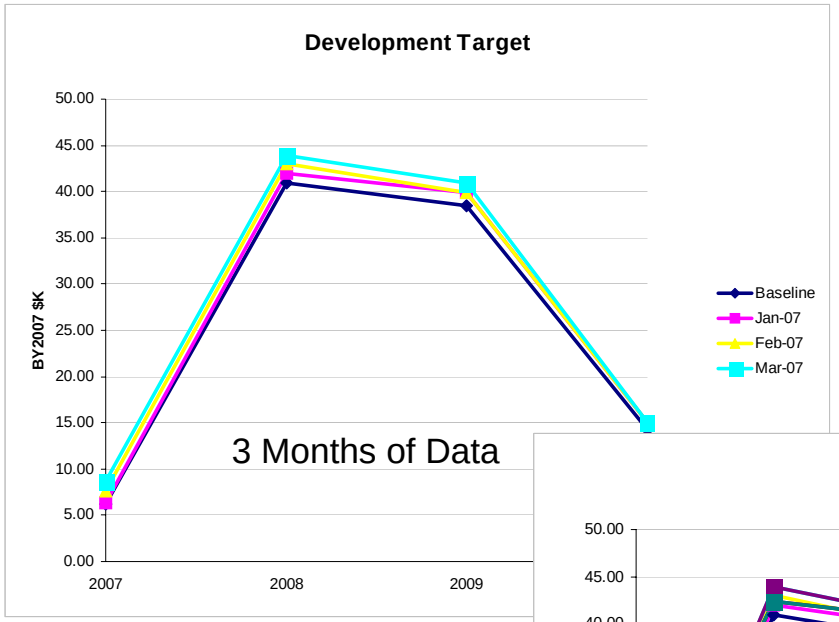
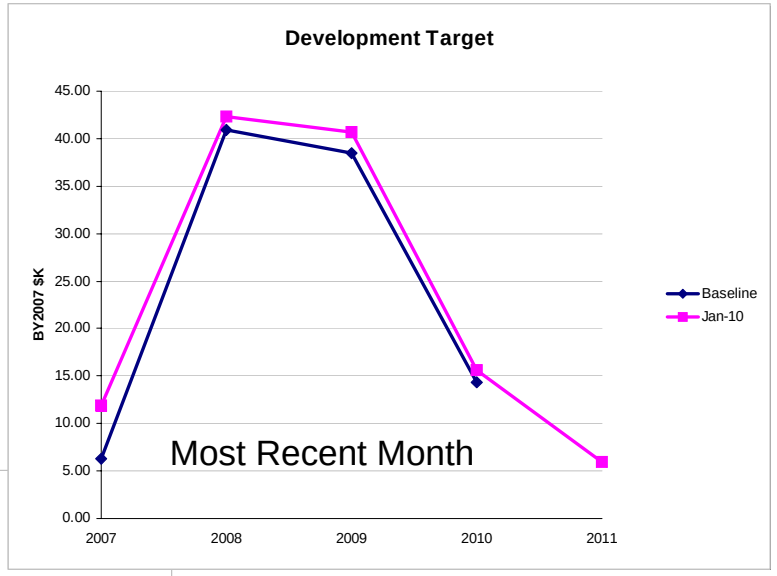
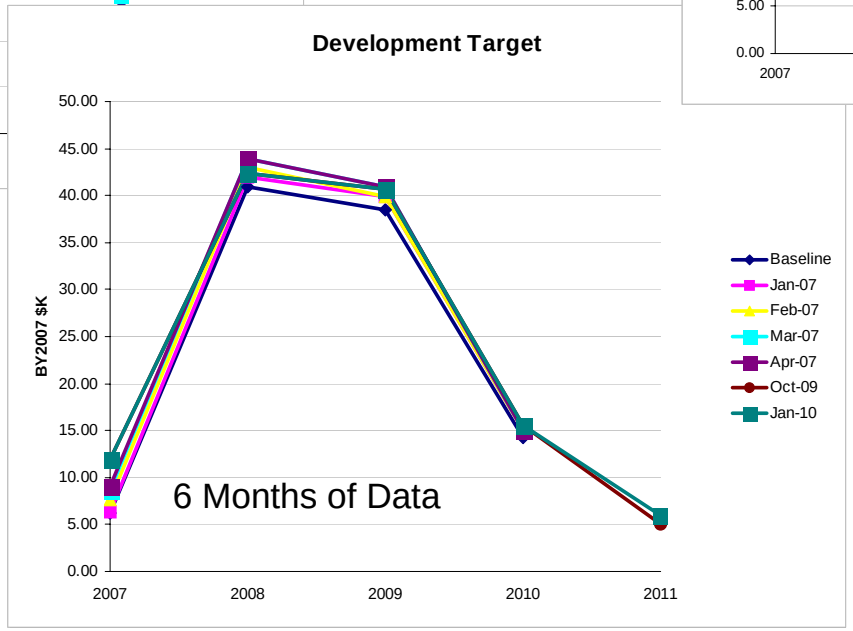
Sample Phased Development Cost Reports

- Shows Annual Projections Comparing Target to Monthly Updates







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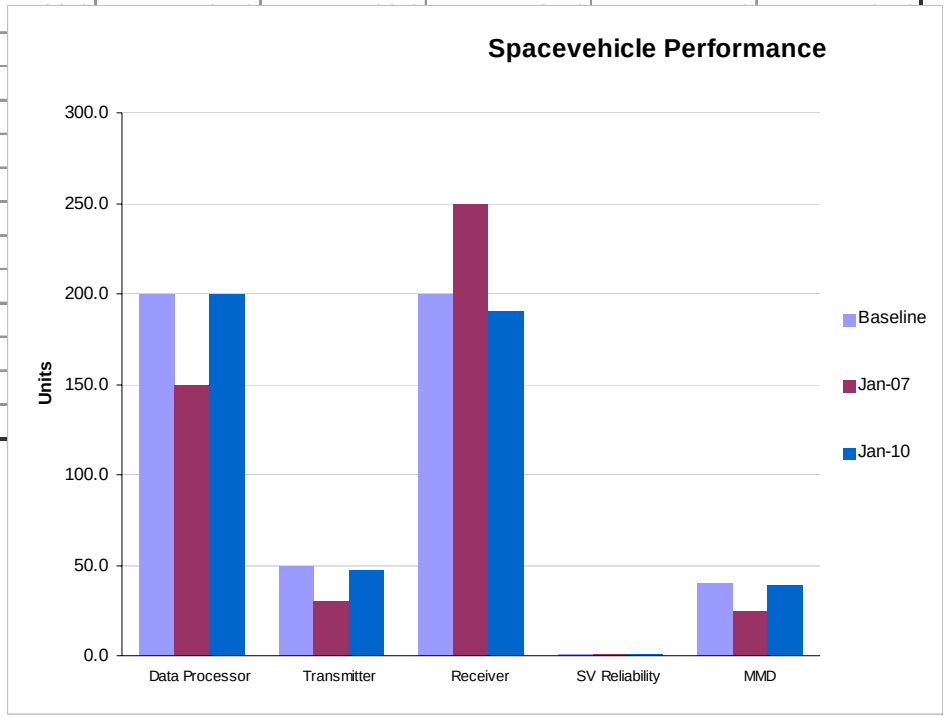
Sample Performance Comparisons

WBS	Baseline	Jan-07	Feb-07	Mar-07	Apr-07	Oct-09	Jan-10
*WEIGHT TARGETS							
Spacevehicle development dry weight total	2515.0	3479.0	3279.0	3263.0	2981.0	2869.0	2628.0
Spacecraft Bus	2150.0	2975.0	2790.0	2765.0	2499.0	2425.0	2212.0
Structures and Mechanisms	500.0	600.0	585.0	580.0	540.0	530.0	515.0
Thermal Control	200.0	300.0	330.0	320.0	299.0	290.0	250.0
Electric Power System (EPS)	1000.0	1600.0	1400.0	1400.0	1200.0	1150.0	1000.0
Attitude Determination & Control (ADC)	150.0	150.0	150.0	150.0	150.0	150.0	150.0
Propulsion Sub System	250.0	245.0	245.0	240.0	240.0	240.0	242.0
Tracking, Telemetry & Command (TT&C)	50.0	80.0	80.0	75.0	70.0	65.0	55.0
Payloads	365.0	504.0	489.0	498.0	482.0	444.0	416.0
Data Processor	50.0						
L Band Suite	100.0						
Atomic Frequency Standard (AFS)	15.0						
Xlink Communication Suite	100.0						
PL Antenna System	100.0						
*Performance TARGETS							
Spacevehicle Performance	490.8						
Data Processor	200.0						
Transmitter	50.0						
Receiver	200.0						
SV Reliability	0.8						
MMD	40.0						



Interpretation of Targets

WBS/CES Description	Units	Comments	Value
* Performance TARGETS			
Spacevehicle Performance			
Data Processor	ms	Greater than	200
Transmitter	w	greater than	50
Receiver	w	Less than	200
SV Reliability	%	Greater than	0.8
MMD	yrs	Greater than	40

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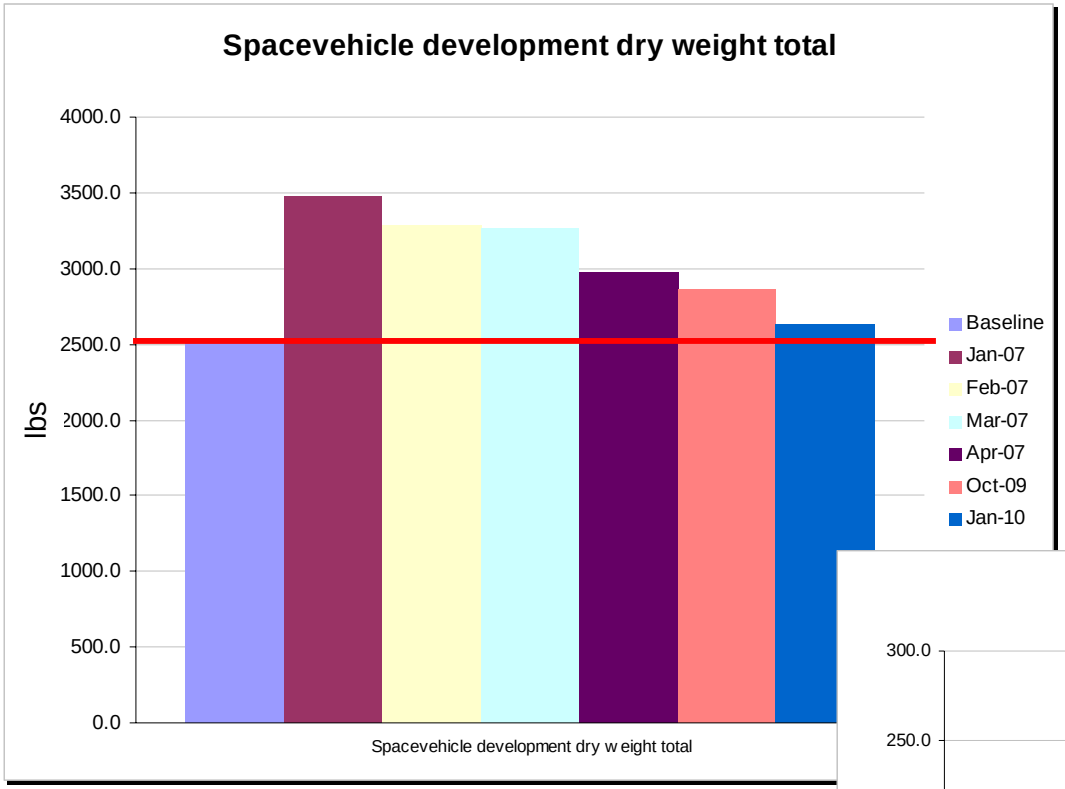
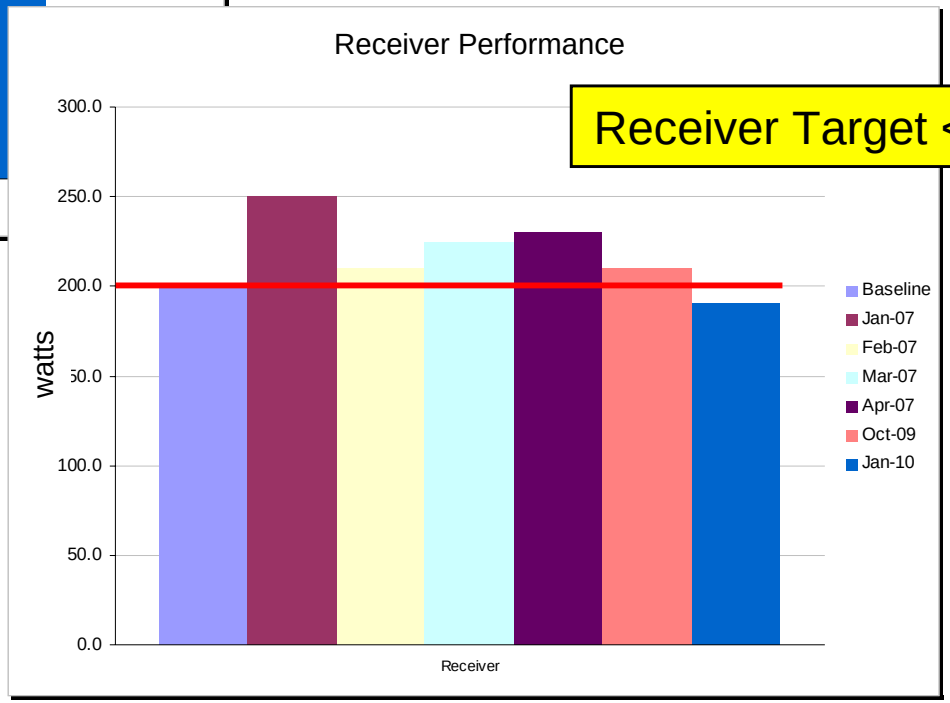
Sample Performance/Design Targets





Receiver Target <200 w

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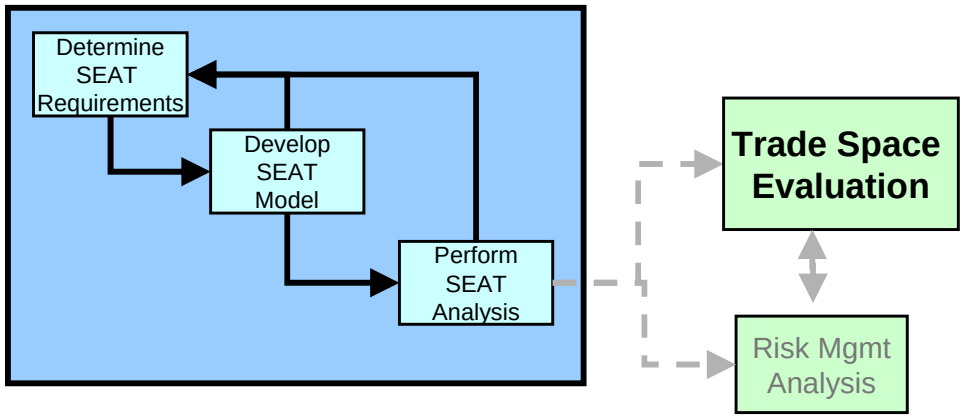
Cost Effectiveness Trade Studies

- **Identify best-value solutions**
  - Trade Studies currently separate process performed with trades tools
    - Data from SEAT manually input into trades tools
- **Plans to automate input from SEAT to Trades tools**
  - Create Interface between SEAT Model and Trade Study Tools (i.e. Design Sheet)
    - Detailed Exploration of Trade Space
    - Rapid Analysis
    - Best-Value Solutions



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Next Steps

- **Automate linkage between SEAT and Trade Study Tools**
  - For further analytical studies
- **Implement Risk/Opportunities in SEAT**
  - Update Model
  - Perform RIO (Risks, Issues, Opportunities) Analysis
  - Evaluate Risk Reduction Candidates
  - Integrate Cost Risk Analysis with Risk Management

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Summary

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Summary

- **Systems Engineering Affordability Tracking (SEAT)**
  - Is a Process/Tool to Help Produce a More Affordable System
- **Affordability is an on-going process which helps**
  - determine cost and performance requirements
  - thoroughly explore the Trade Space
  - identify “best-value” solutions
  - play an integral role in SEAT
- **Implementation and Analysis**
  - Steps to implement the SEAT system
  - Types of analyses and reports
- **Future Plans**
  - Link SEAT to Trade Study Tools
  - Implement RIOs in SEAT model

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